The Year Ahead Filled with Challenges and Opportunities

BY PEGGY LEMAUX
ASPB President, University of California, Berkeley

I agreed to run for election to ASPB’s presidency in order to be at the forefront of providing input on important decisions related to ASPB, plant research in general, and its funding—issues that dramatically affect the plant science community in the United States and around the world. The active role that ASPB plays in the Washington “scene” makes these types of efforts possible. Now that I have been elected as president, one of my top goals will be to leverage that presence through our active Public Affairs Committee and our government relations partner, Lewis-Burke Associates. These efforts will focus on pressing for increased funding for plant research—particularly important for professionals in the early stages of their careers. Given that 40% of ASPB’s members are from more than 50 countries around the world, these efforts will attempt to reach beyond U.S. borders through partnerships with similar organizations in other countries. It is important for the voice of plant science to be universal, as there is increased need for investments in plant research in order to address the impacts of global climate change and world population growth that certainly will touch the lives of individuals worldwide.

Funding for scientific research in general falls well below what is needed to realize... continued on page 3

On Your Mark, Get Set . . . Get Nominating!

It’s Time to Recognize Our Fellow Plant Scientists

The 2013 Call for ASPB Award Nominations will be sent to all members on January 3. Nominations are due by Tuesday, February 12. ASPB encourages you to participate in the 2013 awards program by nominating deserving individuals. Please watch for the Call for Nominations in your mailbox or on our website (http://awards.aspb.org). When you visit ASPB’s awards pages, you can see who among your colleagues has received these awards in the past and determine who else might be deserving in the future.

Please note: The nomination process has been streamlined. Letters of recommendation are no longer required for any awards except the ASPB–Pioneer Hi-Bred Graduate Student Fellowship. All that is required to make a nomi-... continued on page 4
ASPB News | November/December 2012

Contents

1 President’s Letter
1 On Your Mark, Get Set…Get Nominating!
5 ASPB Officers Assume Posts for 2012–2013
7 Plant Biology 2013: Call for Abstracts

People
9 Forest Fires, Mosquitoes, and Better Beer
11 Balzan Prize Awarded to Sir David Baulcombe

Luminaries
13 Bob Goldberg

Where Are They Now?
15 Adrienne E. Clark

Public Affairs
17 Policy Update
18 Peter Raven Receives ASPB Leadership in Science Public Service Award

Education Forum
19 Teaching Life—Art, Arabidopsis, and Advanced Architectural Amenities
21 ASPB–BSA Core Concepts and Learning Objectives in Plant Biology for Undergraduates
22 ASPB Members Named 2012 PULSE Vision & Change Leadership Fellows
25 ASPB Sponsors 12 for 2012–2013 Master Plant Science Team
27 Act Now! Help U.S. High Schools and Public Libraries Gain Free Access to ASPB’s Online Journals
29 Introductory Biology Project Summer 2012 Conference
31 DC Teachers Night 2012

Obituary
32 Simon Chang
33 Dring Needham Crowell

The ASPB News is distributed to all ASPB members and is also available online. It is published six times annually in odd-numbered months. Its purposes are to keep membership informed of ASPB activities and to reinforce the value of membership. The ASPB News is edited and produced by ASPB staff from material provided by members and other interested parties.

Copy deadline is the 5th day of the preceding even-numbered month (for example, December 5 for January/February publication).

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important scientific achievements. This is particularly true for the plant sciences, largely because plant research does not have the public support that medical research has. Many people do not see the challenges ahead for feeding an expanding population without compromising the environment and our natural resource base. For some federal grant programs that support plant research, success rates for grant applications have dropped to as low as 5%–10%. This means that research has. Many people do not see the challenges ahead for fed

With this awareness, we as plant scientists must make a compelling case to them, and through them to their legislators. We must make the necessary human and financial investments now to keep the food supply sufficient, safe, and sustainable well into the future.

One way we as plant scientists let each other know about the findings that can help us meet tomorrow’s challenges is through our flagship ASPB journals, The Plant Cell (http://www.plantcell.org) and Plant Physiology (http://www.plantphysiol.org). But the landscape for journals is evolving with the advent of journals like eLife, which at least for a while will have all costs covered by other sources, such as private philanthropies. Historically, for ASPB and other professional organizations, journals have been their “breadwinners.” For ASPB, the journals have provided much of the revenue needed to allow us to engage in important non-journal efforts—like political advocacy, which includes making the case for increased funding, public and scholarly education efforts, and support for broadening participation by underrepresented minorities and women in plant science. To make sure that ASPB remains engaged in these important efforts, decisions have to be made as to how the Society will adjust to this new publishing landscape. Our members need to be engaged in helping to define the ways in which the journals and ASPB itself will evolve in response to this new landscape.

With the possibility of diminishing journal revenues—and the need to ensure a sound fiscal future for the society—ASPB is presently engaged in bold new moves to help define that future. These efforts are two-pronged. First, Campbell & Co. has been invited to help ASPB determine whether it seems prudent to establish a “fundraising locus,” which would garner long-term support for our efforts to advance the impacts of plant sciences. Should this assessment suggest that there is indeed potential to realize adequate fundraising goals, this effort will move on toward developing more specific plans, time frames, and up-front investment requirements to establish a development office at ASPB. A second, more ambitious move is through the engagement of a human-centered design firm, IDEO, which is working with ASPB staff and leadership to develop detailed prototypes of technically feasible and economically viable new products and services for current and potentially new audiences. The primary aim is to diversify the revenue streams that underpin ASPB’s operating budget. Both of these efforts are aimed at assuring a viable financial future for the Society and improved goods and services for our members and associated clientele.

Another important effort of the Society in the coming year will be the continuation of the Plant Science Research Summit, which was convened in September 2011 to develop a decadal plan to define critical areas for plant science research. The initial gathering served to establish the foundation that defined where plant science has been and where it is today (http://my.aspb.org/members/group_content_view.asp?group=83621&id=163777). The next step in this important “journey” for the plant sciences will be to prioritize our goals for the coming decade and to organize them into a set of achievable and compelling objectives. This effort will occur during a follow-up meeting to be held at the Howard Hughes Medical Institute (HHMI) on January 7–8, 2013. The identified goals must present a persuasive roadmap that will make it unequivocally clear to lawmakers and voters why investments in plant science research are an undeniable necessity for the well-being of the next generation of plant scientists and consumers.

So, it promises to be a busy and productive year for ASPB, with many critical decisions being made that could affect plant science research and the Society for years to come. I, along with the rest of governance and staff, am ready to help ASPB meet these challenges and define a path forward that I hope will lead to a bright future for the Society, plant science research, and researchers themselves. ASPB members need to be ready to be actively involved in supporting these efforts!
nation for ASPB’s other awards is a one- to two-page letter of nomination and a detailed CV of the nominee. However, nomination committees may go back to the nominator and ask for more information if necessary. Nominations are submitted electronically as a single PDF file. The names of the award recipients will be announced in mid-April via e-mail broadcast to ASPB members. These awards, which recognize the major contributions of recipients, will be presented at the ASPB annual meeting in Providence, Rhode Island. Most of the awards are monetary, and with the exception of the Fellow of ASPB Award, winners are reimbursed for a portion of their travel expenses to Providence.

Awards to Be Given in 2013

Adolph E. Gude, Jr. Award
This monetary award honors the Gude family, who made possible the establishment of the Gude Plant Science Center. The award, established by the Society and first given in 1983, is to be made triennially to a scientist or layperson in recognition of outstanding service to the science of plant biology. Membership in the Society is not a requirement for the award.

ASPB–Pioneer Hi-Bred Graduate Student Fellowship
This award, made possible by the generosity of Pioneer Hi-Bred International, recognizes and encourages innovative graduate research and innovation in areas of plant biology that relate to important commodity crops, including corn, soybeans, rice, wheat, and canola. One $22,000 fellowship will be given annually from 2010 through 2013, with an additional $1,000 awarded for the recipient to attend the ASPB annual meeting in the year of his or her award. Each nominee must attend a U.S.-accredited college or university and must demonstrate interest in the study of plant biology or a related discipline. Each nominee must be a PhD candidate (have successfully passed their preliminary examinations), must demonstrate an excellent academic record (have achieved undergraduate and graduate GPAs of 3.5 or greater), and must be a member of ASPB. An individual may receive this fellowship only once.

Charles Albert Shull Award
This award was initiated in 1971 by the Society to honor Dr. Charles A. Shull, whose personal interest and support were largely responsible for the founding and early growth of the Society. It is a monetary award made annually for outstanding investigations in the field of plant biology by a member who is generally under 45 years of age on January 1 of the year of presentation or is fewer than 10 years from the granting of the doctoral degree. Breaks in careers will be considered when addressing the age limit of this award. The recipient is invited to address the Society at the annual meeting the following year.

Charles Reid Barnes Life Membership Award
This award was 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 60 years old. Membership is a requirement for the award, and, if appropriate, every fifth award should be made to an outstanding plant biologist from outside the United States.

Corresponding Membership
This honor, initially given in 1932, provides life membership and Society publications to distinguished plant biologists from outside the United States in recognition of their contributions to ASPB and to plant biology. 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 would not increase the number of corresponding members beyond 2% of the dues-paying membership. Membership is a requirement for this award.

Early Career Award
The Society’s Executive Committee instituted the Early Career Award 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 an individual, whether or not a member of the Society, who is generally not more than five years post-PhD on January 1 of the year of the presentation. Breaks in careers will be considered when addressing the time limit of this award.

Eric E. Conn Young Investigator Award
The Eric E. Conn Young Investigator Award, first given by the Society in 2011, honors Eric E. Conn’s contributions in plant biology by recognizing young scientists who will be inspired to follow in his footsteps. The award recognizes demonstrated excellence in outreach, public service, mentoring, or teaching by plant scientists at the beginning of their careers. This award is a monetary award made biennially for demonstrated commitment by a member of the Society who is not more than five years post-PhD on January 1 of the year of the presentation. It also provides a one-year membership to the Society.

Excellence in Education Award
This award, initiated in 1988, recognizes outstanding teaching, mentoring, and/or educational outreach in plant biology by an individual, whether or not a member of the Society. It is a monetary award to be made annually in recognition of excellence in teaching, leadership in curricular development, or authorship of effective teaching materials in the science of plant biology.

Fellow of ASPB Award
Established in 2007, the Fellow of ASPB Award may be granted to current members in recognition...
ASPB Officers Assume Posts for 2012–2013

New ASPB Officers and Committee Members as of October 1

Board of Trustees
Richard Amasino (14), chair
Karen Koster (15), treasurer
Danny J. Schnell (13)
Sally Assmann (15)

Committee on Public Affairs
Patrick Schnable (16), chair
Steve Huber (13), immediate past president
Elizabeth E. Hood (13)
Norman Lewis (14)
Maureen McCann (14)
Julian Schroeder (14)
Sally A. Mackenzie (15)
David Stern (15)
Dean DellaPena (16)
Colleen Doherty (14), early career rep

Constitution & Bylaws Committee
Dan Bush (13), chair
C. Robertson McClung (14)
Brian Larkins (15)

Education Committee
Kathleen Archer (15), chair
Erin Dolan, adjunct member (13)
George Ude (13)
Scott Woody (14)
Burkhart Schulz (16)
Sarah Wyatt (16)

International Committee
Leon V. Kochian (13), chair
Bijay Singh (13)
George Ude (14)
Ousmane Boukar (15)
Theresa Fulton (15)
Jaswinder Singh (15)

Membership Committee
David P. Horvath (15), chair
Frank G. Dohleman (13)
Leann Thornton (15)
Rebecca Arundale (13), graduate student member
Kranthi Mandadi (14), postdoc member

Minority Affairs Committee
John J. Harada (14), chair
Adán Colon-Carmona (13)
Jorge Vivanco (13)
Beronda L. Montgomery (14)
Linda Different Cloud Jones (15)
Michael Gonzales (15)
Gustavo Macintosh (13), adjunct member

Nominating Committee
Alan Jones (13), chair, president-elect
Peggy Lemaux (13), president
Steve Huber (13), immediate past president

Program Committee
Julia Bailey-Serres (13), chair, secretary
Alan Jones (13), president-elect
Judy Callis (13), past secretary
Jeffrey F. Harper (13)
Steve Moose (14)
Andrew Bent (15)
Bonnie Bartel (16)

Publications Committee
Sally A. Mackenzie (14), chair
Caren Chang (13)
Gary Stacey (15)
Georg Jander (16)
Neil E. Olszewski (17)

Women in Plant Biology Committee
Kateri Duncan (14), chair
Wendy Peer (13)
Carolyn Wetzel (13)
Cathy Bermudez-Kandianis (15)
Michael M. Neff (15)

Executive Committee
Peggy Lemaux (13), president
Steve Huber (13), immediate past president
Alan Jones (13), president-elect
Julia Bailey-Serres (13), secretary
Karen Koster (15), treasurer

Elected Members
Gloria Muday (13)
Richard Vierstra (14)
MariaElena Zavala (15)

Sectional Representatives
Zhongchi Liu (13), Mid-Atlantic
David Logan (13), Western
Kent Chapman (14), Southern
Om Parkash Dhankher (14), Northeastern
Sarah Wyatt (14), Midwestern
The 30th Annual Interdisciplinary Plant Group Symposium will focus on “Root Biology”. The symposium will bring together researchers from across the globe to address recent advances in studies of root development and root interactions with the abiotic and biotic environment.

Information and Registration
www.ipg.missouri.edu/symposium

Hosted by the Interdisciplinary Plant Group at the University of Missouri with support from the Food for the 21st Century Program and in cooperation with the MU Conference Office.
Abstract Categories
Abiotic Stress—General/Integrated
Abiotic Stress—Light
Abiotic Stress—Salt/Metals/Nutrients
Abiotic Stress—Temperature
Abiotic Stress—Water
Applied Plant Biology/Biotechnology/Molecular Breeding
Biochemistry and Metabolism
Biofuels
Cell Biology
Development
Ecophysiology and Whole Plant Physiology
Education and Outreach
Epigenetics
Gene Regulation and Molecular Biology
Genetics, Genomics, and Molecular Evolution
Hormone Biology
Model Systems, Synthetic Biology, and Technological Advances
Photosynthesis
Plants and Climate Change
Plants and Human Health
Plants Interacting with Other Organisms
RNA Biology
Signal Transduction
Systems and Computational Biology and Bioinformatics

Call for Abstracts
Submission Opening: December 2012
http://aspb.org/abstracts

ASPB invites the submission of abstracts that report new scientific research developments in the areas of plant biology. Abstracts are welcome from scientists and students in all sectors, including academia, industry, government, and education.

All abstracts submitted for consideration for a minisymposium talk are reviewed by the program committee and will make up the scientific program for 28–30 minisymposia. Complete abstracts will be online ONLY.

Abstract submission is separate from annual meeting registration. Please register for the annual meeting at the conclusion of your abstract submission.

Submission Deadlines:
March 2
Regular abstracts (consideration for minisymposium talk)
June 1
Regular abstracts (poster only, for inclusion in memory stick)
June 15
Late abstracts (poster only)

Abstracts must be submitted via the web at http://aspb.org/abstracts
Help Your Students Put Down Roots
Provide Them with Membership in ASPB!

Have you thought about sponsoring your graduate students’ ASPB membership? If you submit their membership applications with your membership fee (if you are not already renewed for 2013), you will receive a $5 discount on the membership fee for each student you sponsor. All you have to do is fill out the forms and send them to us with payment.

Why provide ASPB membership to your students?
Graduate students are the future of plant biology; if we get them involved now, they are more likely to stay involved throughout their career.

Membership offers many benefits to your students
• The online Career Center, which provides students with information about jobs in the field, the member-only ability to post their resume, and links to other career resources
• Online networking tools through the ASPB website
• Free online access to two world-class journals: The Plant Cell and Plant Physiology
• Reduced registration rates for the annual meeting, where students can gain experience by presenting their work, take workshops that will help them as they become professional scientists, and network with other students and scientists from around the world
• Access to travel grants to support attendance at the annual meeting
• The bimonthly ASPB News and monthly Member Chatter e-mail, which keep members up-to-date on Society happenings
• Opportunities to volunteer in the Society
• Membership is as important to students as it is to professional scientists. In the words of one of ASPB’s student ambassadors (http://my.aspb.org/ambassadors):

ASPB gives a wonderful opportunity to better understand the different aspects of plant science and cutting-edge technologies through its publications, The Plant Cell and Plant Physiology. It also provides extraordinary support from the plant science community in the form of forums and blogs. [For] a PhD student, it is very important to become aware of the nature of current work in relation to plant science by sharing experiences and information and by networking. For all of these, ASPB is the most suitable platform.

—Prateek Tripathi
South Dakota State University

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Sitting just on top of the horizon was a swath of white, a small buffer between the blue sky and the yellow acres of corn. I was driving west through Kansas on that oldest of interstates, I-70, to spend a few months away from my regular life as a graduate student at Yale. Instead of hours at the lab bench, I’d be writing, producing, and voicing local science stories for KUNC, an NPR station in northern Colorado.

Despite hailing from Ohio, I had never driven past Indiana and had never seen the Rockies. On this third straight day of driving, I wondered if these curious white patches were clouds clinging to the forests and obscuring the mountains.

I would soon learn they were indeed clouds—of smoke. Visible a state away, the High Park Fire had started earlier in the day. It would be the first of several major forest fires in the region over the next few months.

It turned out that KUNC was the nearest NPR station to this kickoff blaze, so my introduction to the station was a chaotic one. The small but talented and dedicated staff swiftly began their excellent coverage. The newsroom was constantly abuzz, with the friendly reporters repeatedly telling me how abnormal the frenzy really was.

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Having little time for direct training those first two weeks, I cut my teeth pulling audio from press conferences about the fire for use in newscasts and by updating the website. Anxious to get started doing serious science reporting, I found what I thought was a great scientist to interview about the fire: an expert who had done research specifically looking at the impact of mountain pine beetle infection of trees and the risk of wildfire. It was an angle the other media had yet to pick up on, and I was excited to do my first real interview. After repeated calls and e-mails, however, it became clear my ideal source wasn’t available. My second-string sources for this story were also unavailable.

With this disappointing but realistic introduction to journalism, I turned my attention to other potential local science stories, including the perennial issue of West Nile virus and the rash of infected mosquitoes.

A publication by a local pair of professors making headway on creating a drug to treat West Nile virus led to my first feature story. At four minutes long, the radio feature was my longest format, with enough time to delve into a topic in some detail. This type of story quickly became my favorite, as it involved field interviews where I went on-site to talk to scientists about their work. It also allowed for greater creativity in both storytelling and the use of sound.

For that first story, for example, I used a photocopier sound effect as an analogy for viral replication. Snippets of Bach’s “Prelude in C” made its way into a story about chaos theory and rock climbing. And I even used a clip from the Star Wars film The Empire Strikes Back to introduce audiences to the concept of cold plasma.

While I had some experience writing about science before getting to KUNC, I had never written for radio or conducted interviews where sound quality mattered or where ambient noises could be captured and woven into the story. On a feature about improving barley breeding for tastier beer, a portion of the interview was at a brewery, which was working with university scientists on the project. It turned out that some of the background noise was great, giving the story a colorful sense of place, but also that certain words were undecipherable. I quickly learned to improve my recording techniques and use more inventive sound editing.

I feel extremely lucky to have been part of the KUNC team this past summer and to have been able to cover so many different topics in science—from math, chemistry, and ecology to biomedicine, space, and anthropology. I especially enjoyed being able to speak with so many scientists, learning about their particular worlds, and then returning to my temporary home, and with the help of my editors, translating what I’d learned into something nonscientists could also find fascinating. While I still have much to learn, I feel I’ve made quite a bit of progress since I first saw those smoke clouds in June.

See our announcement for the 2013 ASPB/AAAS Mass Media Science & Engineering Fellowship on page 10.
Are you interested in science writing?

Do you want to help people understand complex scientific issues?

Apply for the ASPB/AAAS Mass Media Science & Engineering Fellows Program and learn how to increase public understanding of science and technology. Fellows in the 10-week 2013 summer program will work as reporters, researchers, and production assistants in mass media organizations nationwide. Deadline: January 15, 2013.

Former host sites include:

• Chicago Tribune
• Los Angeles Times
• National Public Radio
• Sacramento Bee
• Scientific American

Visit http://www.aaas.org/programs/education/MassMedia/ for more details and to download an application brochure, or call 202-326-6441 for more information.
Balzan Prize Awarded to Plant Geneticist
Sir David Baulcombe

Sir David Baulcombe, plant biologist and geneticist, has been awarded the 2012 Balzan Prize for Epigenetics. Sir David is being honored “for his fundamental contribution to the understanding of epigenetics and its role in cell and tissue development under normal and stressful conditions” (http://www.balzan.org/news-en/the-balzan-prizewinners-2012_6455.html). He is Regius Professor of Botany, Royal Society Research Professor, and head of the Department of Plant Sciences at the University of Cambridge, where his laboratory studies the role of RNA silencing in disease resistance and downstream epigenetic effects.

Sir David’s seminal contributions to science include the discovery of small interfering RNAs that mediate post-transcriptional gene silencing (PTGS) and the identification of viral suppressors of PTGS. For these and a long career including many additional scientific achievements, he has received numerous awards and honors, including the Royal Society’s Royal Medal, the Wiley Prize in Biomedical Sciences, the Albert Lasker Award for Basic Medical Research, the Wolf Prize in Agriculture, and the Harvey Prize in Science and Technology. He has also been named a fellow of the Royal Society, foreign associate member of the National Academy of Sciences, and member of the European Molecular Biology Organization and was knighted by Queen Elizabeth II for his service to plant science.

Upon receiving the Balzan Prize, Sir David stated, “I thought that the real prize was to have had a fantastic group that made discoveries leading to our understanding of RNA silencing and epigenetics. But the Balzan is a very fine icing on the cake.”

The Balzan Prize is given annually in four categories determined the previous year. Half of the 750,000 Swiss Franc award must be designated to support research, preferably involving young investigators. The prize is given in honor of Eugenio Balzan “to promote culture, the sciences and the most meritorious initiatives in the cause of humanity, peace and brotherhood among peoples” (http://www.balzan.org/en/balzan-prize-milan_54.html).

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Welcome to the ASPB News “Luminaries” column. Student and postdoc members are welcome to submit their ideas for a 500- to 750-word interview they might like to conduct with a prominent scientist. Just contact Membership Committee Chair David Horvath at david.horvath@ars.usda.gov, who will help you develop some questions to frame your story. If we publish your interview, you will receive a $50 Amazon gift card.

Bob Goldberg
Professor, University of California, Los Angeles

BY MARGARET TAYLOR, University of Minnesota

MT: Since you joined the faculty at UCLA in 1976, it’s become possible to dive into an organism and look at every gene you’re interested in. This wasn’t possible back in 1976. How has technological change over the course of your career affected how you do research?

BG: That’s an interesting question because at every stage of my career, there have been technological changes that have spurred and accelerated the course of my research and have allowed a lot of things to be investigated that weren’t possible before those technological changes came along. I think that one was being able to handle plant genes, plant DNA and RNA, on the biochemical level. The biggest change, though, in the mid-seventies, was the invention of genetic engineering, recombinant DNA. Prior to 1973, no one had thought about genetic engineering. In 1973, Stanley Cohen and Herb Boyer invented genetic engineering, meaning that you could stick a gene in a plasmid and allow the plasmid to have a piece of DNA that it wasn’t born with. That changed everything. I started my professorship in 1973, so the invention of genetic engineering coincided with the beginning of my career.

MT: I heard you had a long and winding path to where you are now. Was there a specific moment that turned you on to biology?

BG: I think that, like a lot of people, the “eureka moment” comes when you have an inspiring professor who turns you on to a topic and allows you to see things in a different light or helps you think about something that you hadn’t quite thought about in an exciting way before.

I think the eureka moment for me was my freshman biology class, with my wonderful undergraduate professor Norman Cohen from Ohio University. I think he was such a remarkably dynamic young professor at the time that I was turned on to genetics more than anything else—specifically, the relationship between genes and genetic processes and those kinds of things.

I think there’s probably a combination of things, but if you get into the right class with the right professor, and he or she is incisive and exciting and presents the material in provocative and fantastic ways, as Norman did—that’s what turned me toward the field of genetics.

MT: The undergraduate courses you teach have acquired something of a reputation on campus. How did this happen?

BG: Because I’m a crazy guy! I’m pretty radical on everything I do. I’ve always tried to push the buttons with my research and my teaching.

I think that I view teaching as very similar to research. You have to experiment with new tools, and you have to try new techniques. The goal is to try and teach students how to think critically and open up new horizons to them that they hadn’t seen before.

MT: What advice would you give to grad students facing their first teaching experience?

BG: I think my advice would be to find a great mentor who’s a fabulous teacher. Just grab onto that mentor and learn every single thing about teaching, by observing, talking, and doing your teaching with him or her. I don’t think there’s any substitute for that.

The most important thing graduate students can do in their discussion sections is to try to teach their students how to think and to understand the critical continued on page 14
thinking process. Use an exciting field, use something that’s fun that the kids can grab on to. In plants, it could be genetic engineering; in animals, it could be stem cells, cancer, or obesity; or any of these things that kids could identify with. If you get something that impacts their lives on a daily basis, and then teach critical thinking, even though they don’t know they’re being taught critical thinking, then it becomes a big success because they’re motivated to understand the subject.

MT: Are the undergrads in your classes any different from how they used to be?
BG: That’s a good question. In general, no. But it’s more complicated by the society in which they live. In terms of interest, intelligence, ability, and all of the basic stuff, the answer is they’re about the same. But in terms of how worried they might be about where they’re going to be five or 10 years from now, I think that there’s a lot more angst than there was 10 or 20 years ago. I think that’s simply because they’re living in these very difficult economic times. I think that causes them to choose career paths that are a little bit more obvious than in the old days, when people were more than willing to take a chance and say, “Well, I’m going to be a philosophy professor,” or something like that. Now, they might say, “Well, I don’t know, maybe there are no jobs for philosophy professors. Maybe I’ll go into computers or medicine or something like that.”

MT: What’s hot in plant biology now?
BG: I could talk forever on that—and that’s going to really be clouded by one’s interests. I think the most exciting thing in plant biology, or biology in general, is the ability to uncover every gene in every genome of every organism on the face of this earth. I think being able to understand all the genes in the diversity of the plant kingdom will give us the raw material to understand how the diversity of form and function in plants has evolved to give us this remarkable thing called the plant kingdom. The corollary to that is that once we have all that information, we will use that information to do a lot of great things in either genetic engineering or classical breeding. We’re going to be able to use this natural variability and diversity within the plant kingdom and harness it to make better soybeans, cotton, corn, and everything else. We’ll be able to grow a lot more on a lot less. I think when we look at agriculture 100 years from now, plants are going to look very different. I mean, they’re going to look the same, but they’re going to perform very differently, and much more spectacularly than they do now. We’ll be harnessing all this gene information that we know from all of these genome projects that are going on. In my mind, I think that’s really one of the most exciting things that’s happening in plant biology.

MT: I have read that you’re also involved in the biotech sector. Where do you see the industry going in the next 10 years?
BG: If you ask the question of where biotech is going over the next 10 years, it’s difficult to answer that because there may be technological changes that we can’t anticipate. No one anticipated the invention of genetic engineering. No one anticipated the invention of plant genetic engineering until it was done. No one anticipated the Internet, in many respects, and how it’s used, and the information revolution. Projecting 10 years is forever when it comes to technology, particularly in this day and age.

Plant biotech is a tough, tough question. It’s mingled with the genetic engineering issue, which unfortunately has been one of the most contentious issues of the past decade. And that has really, in my opinion, kept plant biotech in some respects from moving forward. There are a lot of genetically engineered plants on the market in the United States, namely soybean and corn. But in terms of putting new things out there, it’s been difficult because of the pushback from activists on this issue and the antiscience perception of genetic engineering. It’s hurt our field tremendously in ways that I don’t think will be understood for another decade.
As the years churn on, many esteemed members of ASPB have passed the torch to their younger colleagues and stepped out of the limelight to allow others to bask in its glory. Yet, many continue their good works to the benefit of plant biology and the world. Edited by Beth Gantt, University of Maryland, “Where Are They Now?” is the latest addition to the ASPB News suite of columns focused on the personal and scientific life and insights of ASPB members at all stages of their career. This column will offer a look into the current activities of influential members of ASPB who continue to make a positive mark on our Society. We hope you all enjoy this new addition to your newsletter.

Please feel free to submit your own article to “Luminaries,” “Member Corner,” or “Where Are They Now?” For details please contact me, David Horvath, Membership Committee chair, at david.horvath@ars.usda.gov. As always, we are open to suggestions for articles or features of interest to readers of the ASPB News. Enjoy!

Adrienne E. Clarke
Chancellor, La Trobe University, Australia

Although I have had many wonderful retirement parties, I have never really retired. I have been extremely fortunate to have three overlapping professional lives—as a scientist and educator, as a company director, and as a government and vice-regal representative in Australia. Currently, I am the chancellor of La Trobe University, in the State of Victoria, Australia, and anticipate celebrating my 75th birthday in January 2013.

These different lives have all been interdependent. First and foremost, I am a scientist. I think that it is the culture of science and the experience of research that enabled me to contribute to the other worlds of business and government.

For example, scientists are very used to saying, “Could you explain that again?” and “Could you take me through the reasoning for this again?” Among scientists, these questions are not taken as an admission of ignorance or inadequacy; they are taken as a request to understand the process of getting to a certain position. I was very surprised to find what an unusual strength this is as I started to participate in decision making in the worlds of business and government.

Another aspect of the culture of science that has been extraordinarily useful to me in engaging in these other worlds.

During my career in science, there were a couple of pivotal experiences. First, my colleagues and I were awarded a large Australian Research Council grant early in the 1980s. It was a substantial budget in five-year blocks and was entirely flexible. We could afford to take risks and set a really challenging goal. We set out to clone the gene controlling gametophytic self-incompatibility.

At the same time, we were contracted to a U.S. venture capital company, Agrigenetics. This was a remarkable experience. The company strategy was essentially to create valuable intellectual property applicable to agriculture. The contracted scientists were given lessons in patenting strategies, IP management, marketing, commercial strategies, and so on—in fact, all the facets of a start-up business. We were amazed. A new world opened for us.

We set out on our quest for the S-gene and ultimately discovered that in the female tissues, it coded for an allelic series of ribonucleases. The work was published in a series of papers in Nature.

During this journey, other opportunities presented. One was to chair the board of Australia’s premier science and technology organisation, the CSIRO. It was an exciting time, and I depended on the skills and support of my fellow board members to steer the ship through political shoals and legal entanglements while maintaining a focus on long-term scientific capability and directions. This experience led to a very active period as a company director of several major public companies listed on the Australian Stock Exchange, for example, in the fields of minerals exploration and mining, supermarket and retail goods, and manufacture of medical devices and biotechnology. I was able to contribute to these companies at the board level at the same time that my scientific research continued with the skillful work of (then) program leaders, (now) professors, Marilyn Anderson, Tony Bacic, and Edwina Cornish.

During this period, I also served governments, for example, on the Prime Minister’s Science
MT: Who should be in charge of implementing all this biotechnology—big companies, small companies, or the government?
BG: All of the above. It takes a village, so to speak. It takes young kids like you, doing the most exciting work you possibly can. I think it takes companies to take the exciting discoveries that you've made, the ones that are cutting edge, and put them in the field and see—are there more seeds? I think it takes companies to innovate and come up with seeds? I think it takes companies to innovate things for the public sector that maybe companies won't do.

MT: When will crop plants reach their thermodynamic limit?
BG: Who knows whether there is a thermodynamic limit to plants? I don't think anyone really recognizes what the potential of plants is. I don't think we understand on a systemwide basis how everything is connected and how we can change those connections.

Think back 100 years to 1912. That was only a few years after Mendel's laws of genetics were rediscovered. It was only a year or so after the word gene was invented. Now flash forward to 2012, and think about how we've invented modern agriculture and created hybrid plants. Hybridization was unknown before the 1930s. Flash forward 100 years and think about how far we've come. We're sequencing whole genomes—in only 100 years.

In 100 years from now, people will look back and say, "In the early part of the 21st century, they didn't know very much. Look how we can make these huge plants that are totally resistant to drought, and they don't need any nitrogen, and they're the ultimate in organic crops—they don't need any spraying, they're resistant to insects, they're resistant to fungi, they're resistant to pests, they're making lots of nutritious seeds, and they're doing it really well. And we don't have to use millions and millions of acres of land because we can produce just as much yield on hundreds of thousands of acres of land. People in the sub-Saharan can grow plants in conditions that they wouldn't have dreamed of 100 years ago. We can feed people in ways in which we never could dream."

MT: That's a beautiful picture of the future.
BG: That's the picture I see. Now, if I could give up the remaining years of my life to see one week 100 years into the future—I know you're going to find this very strange—I would probably do it. If I could make some compact with somebody to fast forward 100 years, but give up the time that I have here, I would do it because I'm so curious to see what the future holds.

WHERE ARE THEY NOW? continued from page 15

and Engineering Council, the Agrifood Council, and at the state government level on various boards. These experiences led to my being appointed as lieutenant governor of the State of Victoria. To prepare myself for this role, I needed training in constitutional law. Fortunately, I had a friend who was the professor of constitutional law at the University of Melbourne. I felt very privileged to experience the processes of government from this perspective.

There was one more critical journey in my professional life. This started with the discovery that defensins and proteinase inhibitors were present in high concentrations in the female sexual tissues of the experimental plant we used for cloning the S-gene, Nicotiana alata. We wondered whether the reason that these molecules were present in this location could be to protect the female tissues from disease and insect damage. We tested the effectiveness of these molecules in protecting crop plants, first in the lab and then in the field. To do this we raised funds to prove the concept, and then created a public company to develop the applications for protection of crop plants. This activity took me well past the statutory retirement age. The chief scientist of this company is now Professor Marilyn Anderson, one of the original inventors. The company now employs about 30 scientists. To build the structures for the development of these discoveries, I called on all the experiences I had from Agrigenetics, from being a director of public companies, from working with government, and from being a scientist. I also called on many friends and colleagues to help.

Two years ago, I became chancellor of La Trobe University. This university is the highest ranked university in Australia for biochemistry. The foundation professor, Bruce Stone, supervised my PhD and also those of Marilyn Anderson and Tony Bacic. It is another wonderful opportunity to help grow an institution that is very important in Australia in times of great change and uncertainty.

The other critical success factor in all these journeys is having good friends willing to help. Without them, none of these endeavors would have been successful, and I would never have had such fun.
Policy Update

BY KAITLIN CHELL
Lewis-Burke Associates, LLC

The 112th Congress is approaching the end of its tenure without, at the time of writing, addressing many pressing issues. Both Democrats and Republicans have found little common ground, although support for scientific research remains generally bipartisan. However, as neither party appears to be willing to “work across the aisle,” legislative gridlock persists, especially as both parties fight to gain or maintain control of the House and Senate.

Congress Further Stalls Fiscal Year 2013 Funding Bills

Since President Obama released his fiscal year 2013 (FY2013) budget request in February, the House and Senate did make progress toward finalizing appropriations bills that fund the federal government. For a while it seemed as though Congress might pass these spending bills; however, those hopes were quickly stymied as spending bills; however, those hopes were quickly stymied as finalizing appropriations bills together during a lame duck session before the end of the calendar year, or it may decide to wait until the CR expires next spring. Either way, a battle over the funding levels likely will ensue as each party has prioritized different programs for spending increases and cuts.

Given the CR, funding for scientific research should remain level and there is no immediate cause for concern. However, Congress still must address “sequestration.”

“Sequestration” Outcome Still Unclear

Sequestration, a process by which across-the-board—minus a few exceptions—spending cuts are automatically carried out, is the result of the failure of last year’s “Supercommittee,” which essentially was tasked with single-handedly solving the nation’s fiscal crisis. Because the Supercommittee could not reach an agreement, sequestration will be triggered, cutting approximately $1.2 trillion in federal spending from 2013 to 2021. Although both the process and the path forward are vague, it is widely agreed that Congress must address this issue before the funding cuts become effective on January 2, 2013. In advance of the sequestration, Congress asked the president to submit a report to Congress on the potential impacts. In that report, released in mid-September, the president makes clear that his administration has no flexibility in calculating or implementing sequestration as it is defined in law. The report, conducted by the White House Office of Management and Budget (OMB), says the potential funding impact could include estimated reductions at the following levels in the first year:

- National Science Foundation (NSF), Research account—$469 million
- U.S. Department of Agriculture (USDA), Research and Education Activities—$58 million
- Department of Energy (DOE) Office of Science—$400 million
- National Institutes of Health (NIH)—$2.529 billion

The OMB report is available at http://www.whitehouse.gov/sites/default/files/omb/assets/legislative_reports/startreport.pdf. Additionally, the AAAS released a detailed overview of the sequestration impacts on all of the federal research and development agencies that is available at http://www.aaas.org/spp/rd/fy2013/SeqBrief.pdf.

Although the outcome is unclear, Congress has several options to choose from to address these looming cuts: it could vote to postpone, to repeal, or to allow sequestration to take place. Due to the current economic climate, most members of Congress believe sequestration should not go into effect as the sequestration cuts would have dire consequences for the economy. Both sides of the aisle recognize that Congress must create a plan to lower the federal deficit but that it should be done in a way that does not inflict such deep and widespread harm. As such, although future reductions of some sort are expected, they likely will not be as significant as those that sequestration would enact.

Farm Bill Dies in Congress, 2013 Farm Bill Likely

Although the Senate passed a bipartisan version of the Farm Bill in June and the House Committee on Agriculture approved its version of the Farm Bill in July, there has been no movement to finalize and pass the legislation. At the time of writing, it appears Congress will now have to address the Farm Bill in 2013, although an agreement may be possible during a lame duck session of Congress. That said, this year’s House and Senate versions of the bill will serve as yardsticks for each party’s preferences and visions for programs at USDA, both of which protect USDA’s research portfolio and maintain the authorization level of the Agriculture and Food Research Initiative (AFRI) at $700 million. However, next year’s Farm Bill debates likely will revolve around the same controversial issues—namely, ideological divides on nonresearch related programs, such as the Supplemental Nutrition Assistance Program (SNAP; formerly known as food stamps) and crop insurance.
Peter Raven Receives ASPB Leadership in Science Public Service Award

Speaks on Importance of Research, Education, and Sustainability

Peter H. Raven was selected as this year’s recipient of the ASPB Leadership in Science Public Service Award in recognition of a career of service and scientific accomplishment that extends from plant systematics and evolution to advocacy for conservation and biodiversity in an international context. Peter is president emeritus of the Missouri Botanical Garden and George Engelmann Professor of Botany Emeritus at Washington University in St. Louis. For nearly four decades, he headed the Missouri Botanical Garden, transforming the institution into a world-class center for botanical research, education, and horticultural display.

Peter received his PhD from the University of California, Los Angeles, in 1960, after completing his undergraduate studies at the University of California, Berkeley. Later that decade, he realized that the rapidly increasing human population, consumption, and pollution were threatening global biological diversity, and he became an ardent advocate for conservation throughout the world. Peter was called a “Hero for the Planet” by TIME magazine, and he has received numerous prizes and awards, including the U.S. National Medal of Science, the nation’s highest honor for scientific achievement. He has also held Guggenheim and John D. and Catherine T. MacArthur Foundation fellowships.

In his Plant Biology 2012 address, Peter shared a historical perspective on plant biology research, recounting the slow acceptance of DNA as the genetic instruction manual for cells and cytology as the molecular biology of the day. He became increasingly interested in conservation biology and noted the consequences of the rapid destruction of our planet’s biodiversity, including a reduced capacity to develop useful natural products and form stable communities and ecosystems. He highlighted fundamental research, embracing new technologies, scientific education from K through gray, and sustainable approaches toward feeding a growing global population as essential components of future conservation efforts.

Peter has provided years of public service to many of our nation’s scientific organizations. He has served as president of AAAS, Sigma Xi, the American Institute of Biological Sciences, the Society for the Study of Evolution, the Botanical Society of America, and the American Society of Plant Taxonomists, among others. He was a member of President Bill Clinton’s Committee of Advisors on Science and Technology and served as home secretary and chair of the National Research Council’s Division on Earth and Life Studies of the National Academy of Sciences, to which he was elected in 1977.

Peter has written numerous books and publications, including Biology of Plants (coauthored with Ray Evert and Susan Eichhorn, W. H. Freeman and Company/Worth Publishers, New York), the internationally best-selling textbook in botany. He enthusiastically recommends writing texts as part of all scientists’ professional development to hone lecturing, writing, and time management skills.

The ASPB Public Affairs Committee bestows the Leadership in Science Public Service Award annually, with the recipient delivering an address at the annual meeting. See http://my.aspb.org/?PublicAff_Leadership for information about submitting nominations, as well as a list of previous recipients.
Teaching Life
Art, Arabidopsis, and Advanced Architectural Amenities

BY KATIE ENGEN and JON MONROE

Background for this article came from http://www.jmu.edu/news/2010BioscienceConstruct.shtml and links embedded below.

Started in 2010, the newly opened bioscience building at James Madison University (JMU) offers a special view on life without overlooking valuable practicalities. The building houses all biology classes under one roof, as it also brings the university’s biologists, chemists, and physicists into neighboring buildings. This proximity automatically increases the opportunity for STEM collaborations.

Mark Gabriele, an associate professor of biology who was part of the design team, said, “We’ve put an emphasis on the building being a teaching tool itself. So, this new building has a lot of bells and whistles.” The building was designed by EYP Architecture & Engineering.

Among the many bioscience amenities is a greenhouse, a green roof, an environmentally controlled herbarium, modern teaching and research laboratories, a state-of-the-art microscopy lab, and an outdoor teaching space. Yet perhaps the most visibly impressive amenity is the three-story mural called Life that enhances the building’s impact as a learning space from both inside and out.

Life was created by Alison Stephen (http://alisonstephen.com) in collaboration with ASPB member Jon Monroe, professor of biology at JMU. Alison did research in Monroe’s lab and received her BS in biology from JMU in 1999. She is now an artist working in New York City.

The mural is composed of Alison’s sketches of 16 species of organism around a surface view of about 60 base pairs of DNA. On the first floor are organisms from the earth’s surface or under water, on the second floor are organisms found in a forest canopy, and on the third floor are organisms that fly. The DNA sequence is a portion of the AGLU-1 gene from Arabidopsis thaliana, which encodes the enzyme alpha-glucosidase. This gene was cloned and sequenced in the Monroe lab at JMU by a group of undergraduates, including the artist. The sequence illustrated was converted to a 3D model using 3D-DART (http://haddock.chem.uu.nl/services/3DDART) and visualized using the program Chimera (http://www.cgl.ucsf.edu/chimera). Alison then used a surface view of the model as a starting point to draw an artistic image of the DNA, depicting the various atoms in five earth-tone colors. Her drawing was then digitized using Illustrator, printed, and installed.

A nighttime glow enhances Life. PHOTO BY MIKE MIRIELLO

The depicted region of the AGLU-1 gene encodes a portion of the protein that is highly conserved in alpha-glucosidases. Mutations in this region of the human gene lead to Pompe’s disease, which was the subject of the 2010 movie Extraordinary Measures, starring Harrison Ford. The Monroe lab identified the Arabidopsis gene from Arabidopsis ESTs because of their similarity to the human gene.

continued on page 20
Teaching Life
continued from page 19

Jon says, “Involving undergraduates in research is one of the clear strengths of our department. Many students love it and often go on to enter PhD programs, but some come to realize that research isn’t for them. Allowing students to figure that out for themselves is one of the values of providing undergraduate research opportunities. Alison was a great student, but her passion was clearly for art. We stayed in touch after she graduated, so when this opportunity arose, I thought of her first. It was great fun collaborating with her again.

“The decision to make DNA the centerpiece of the mural was made before I became involved, but my desire was to have it be an artistic view of a real molecule. I was okay with the real part, but to make it a work of art, I needed Alison’s help. Unlike more traditional depictions of DNA, this one is obviously hand-drawn, and up close it contains detailed shapes and colors that are not predictable from a distance. The mural is not only beautiful, it is also useful. This semester my students are calculating how large the Arabidopsis plant would be if its DNA was really that large.”

Mark Gabriele said, “The mural serves as a beacon for our new bioscience building. It exemplifies our mission and dedication to faculty and students working together, as the artist collaborated closely in its development with her former research mentor. It truly symbolizes our goal of putting biology on display.”

Sometimes Image Is Everything!

Jon and his team entered the Life mural in the 2012 NSF International Science & Engineering Visualization Challenge. Their considerations for why the mural is a worthy contender may inspire others to initiate or participate in visualization-based teaching and outreach. First, the mural brings joy to those who see it. It reminds students and visitors of the breadth of biology (from atoms to ecosystems), and it also serves as a starting point for conversations about DNA structure and the diversity of organisms with which we share the planet. The mural is already being used in classes ranging from cell and molecular biology to art history.

The most obvious feature of the mural is its size. Such impressive visual impact catalyzes interest on many levels. Some students can see it from their dorm rooms across the quad, and they describe conversations it sparks among roommates. Up close, the sketches of organisms are simple, beautiful, and sometimes whimsical. On the second and third floors, the space beside the mural contains comfortable chairs (not seen in the photograph). The colors and patterns in the mural provide a beautiful backdrop for students studying between classes.

The mural is an effective form of communicating science. By depicting sketches of DNA and organisms in the style of a da Vinci field notebook, the design team hoped to remind viewers that biological research started long before computers generated much of our visual world. The simple style of the sketches is also intended to encourage students to imagine that they too can learn about and do biology.

Because the DNA represents a real DNA sequence, the mural can inspire students to more easily think about the role DNA plays in the life of organisms.

And, of course, there is a freshness and originality inherent in the mural’s artistic design and location. The structure of DNA is often depicted showing just atoms and bonds. Once seen, such images can be quickly acknowledged as DNA and forgotten. By depicting the surface view of DNA, the mural’s design team hoped to illustrate that part of the DNA to which proteins bind; thus it is a more “biological view” of DNA. Although easily recognized as DNA from outside the building, from the inside the details make the illustration less obvious as DNA, which the designers hope will invite longer periods of gazing and wondering among viewers.
ASPB–BSA Core Concepts and Learning Objectives in Plant Biology for Undergraduates

BY ERIN DOLAN
Education Committee Chair, University of Georgia

The American Association for the Advancement of Science, National Science Foundation (NSF), and other stakeholders recently published a call to transform undergraduate biology education, titled Vision & Change (http://visionandchange.org/finalreport). Major themes of Vision & Change include teaching core concepts and competencies, focusing on student-centered learning, promoting campuswide commitments to change, and engaging the biology community in implementation of change.

ASPB and the Botanical Society of America (BSA) were among the first societies to become involved in Vision & Change when they hosted an information session during their joint meeting in Chicago in 2007. Then NSF awarded ASPB a grant to host a workshop in 2011 to gather feedback from plant biologists on how to put the Vision & Change recommendations into practice. One of the major concerns that emerged from this workshop was the lack of a defined set of core concepts in plant biology that undergraduates should learn. This lack results in underrepresentation or misrepresentation of plants in undergraduate curricula and misunderstanding about the importance and unique functions of plants and their broader contributions to understanding biology (e.g., plants “don’t do much,” plants are “only important for photosynthesis,” plants are “not interesting” to study).

To address these concerns, a working group of ASPB and BSA members was assembled: Kathleen Archer (Trinity College), Erin Dolan (University of Georgia), Roger Hangarter (Indiana University), Ken Keegstra (Michigan State University), Judith Skog (George Mason University), Susan Singer (Carleton College), Neelima Sinha (UC Davis), Anne Sylvester (University of Wyoming), and Sue Wick (University of Minnesota). The working group was tasked with generating a set of core concepts that
• outline what undergraduate biology majors should learn about plants;
• are consistent with themes from Vision & Change and the new K–12 science education framework;
• are the enduring big ideas that explain what makes plants distinct from other lineages of organisms and describe the essential attributes and life strategies of plants; and
• are broad and foundational in nature and can be divided further into multiple subconcepts or units of knowledge (e.g., learning objectives) that are measurable.

For the purposes of this effort, plants were defined as: eukaryotic photosynthetic organisms with multicellular haploid and diploid stages in their life cycle and protected diploid embryos.

This past summer, ASPB and BSA members were invited to comment on a draft of the core concepts during their respective annual meetings; the version now posted on the ASPB site (www.asp.org/plantbiocoreconcepts) reflects this community input. The concepts are organized into the four life science domains of the new framework for K–12 science education (http://www.nap.edu/catalog.php?record_id=13165) developed by the National Academy of Sciences Board on Science Education: (1) From Molecules to Organisms: Structures and Processes; (2) Ecosystems: Interactions, Energy, and Dynamics; (3) Heredity: Inheritance and Variation of Traits; and (4) Biological Evolution: Unity and Diversity. Each set of concepts begins with a description of the foundational knowledge in the domain. Individual concepts are followed by sample learning objectives: what students could do to demonstrate their understanding of the concept. ASPB and BSA leadership urge all who teach undergraduate biology students to use this document as a guide for curricular design and instruction.

Now it’s time for the wider community to consider these concepts and learning objectives. Please send any feedback aimed at further improving the concepts or objectives to ASPB Education Committee member Erin Dolan (eldolan@uga.edu). Also, please consider sharing how you utilize the concepts and objectives in your teaching with members of the Higher Education Interest Group on the ASPB site (http://my.aspb.org/members/group.asp?id=72494).
On September 7, the Partnership for Undergraduate Life Sciences Education (PULSE) program named three ASPB members to serve as 2012 Vision & Change Leadership Fellows (http://www.pulsecommunity.org/forum/topics/announcement-v-c-leadership-fellows). PULSE is a joint effort by NSF, HHMI, and NIH to support 40 Leadership Fellows as they prototype change in undergraduate life science education. More than 250 post-secondary faculty members from 24 states and the U.S. Virgin Islands, representing research universities, liberal arts colleges, comprehensive/regional universities, and two-year colleges, applied to become fellows. The complete list of all 40 fellows is on the PULSE site.

“The strong response we received to the call for applications reflects broad consensus in the community that change is needed,” said HHMI’s Cynthia Bauerle, also a long-term ASPB member. The way biology is taught needs to change if we are to spark student interest in science and to prepare today’s undergraduates to answer challenging 21st-century problems. “The time is now,” said Cynthia.

A panel of experts associated with PULSE selected the 40 fellows based on the notable impact each one has demonstrated in catalyzing reform in undergraduate biology education.

“The fellows represent a diverse group of extremely capable faculty,” said veteran ASPB member Judith Verbeke of NSF. “They bring a variety of experiences that will inform the development of an implementation framework that will transform undergraduate education in the life sciences.”

The 2012 class of 40 fellows will identify and consider how to eliminate barriers to the systemic changes that are needed to improve undergraduate life sciences education.

Cynthia noted, “The 40 Vision & Change Leadership Fellows bring such a wealth of experience...
It is critical that the ASPB membership be actively engaged. Please go to the PULSE website (http://www.pulsecommunity.org) today and become part of this exciting activity.

—Judith Verbeke, NSF

Judith explained, “The PULSE activities are intentionally focused on the academic department as the responsible unit of change. It’s the department that defines the culture in which each faculty member works and each student learns; this is where decisions on wide-ranging issues including curriculum, learning and evaluation standards, teaching assignments, hiring, and promotion/tenure of faculty members are made. The V&C Leadership Fellows are charged to work with the broader community to develop an implementable framework to improve undergraduate life sciences education across institution types.”

This framework will be available on the PULSE website http://www.pulsecommunity.org from November 2012 to May 2013. The partnership recognizes that the 40 fellows are not the only key participants in this initiative; indeed, the program invites the community of undergraduate biology educators to exchange ideas with one another, provide insights and feedback to the fellows, and share and explore resources.

Becoming involved with PULSE was a natural extension of my long-term commitment to making life sciences education as vibrant as possible. PULSE will take us to the next level, starting a national dialogue that will increase the impact of life sciences education and with it, hopefully, change impressions and attitudes nationally toward pressing societal issues surrounding feeding the world in the face of global change.

—Jonathan Cumming

I am honored to be selected as a PULSE Leadership Fellow. I look forward to working with the other fellows to address the challenges facing undergraduate biology education.

—Tom Jack

I’m extremely honored to be selected as a PULSE V&C Leadership Fellow. The work of PULSE to implement change in undergraduate life science education across the nation is inspiring and aligns perfectly with my own personal goals as an undergraduate educator. Transforming undergraduate education in biology, starting at the introductory level, will lead to a new generation of scientists. I look forward to the first steps of engaging in conversations with colleagues at my institution and in other faculty networks to begin a systemic movement for change focused on student-centered learning.

—Nitya Jacob

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ASPB Sponsors 12 for 2012–2013 Master Plant Science Team
Society Continues Partnership with PlantingScience for More Excellent Outreach

BY KATIE ENGEN
ASPB Education Coordinator

PlantingScience (http://www.plantingscience.org) supports ongoing scientific collaborations among students (middle school and up), their teachers, and plant scientists. As classroom teachers monitor general progress, small groups of students pursue hands-on, hypothesis-based investigations of plants while working online with scientists who give constructive feedback as the investigations develop. And although the work is serious, a quick scan of some current student group names—like Team Awesome, Dudes of Science, and El Mundo de Amigos—reveals that this program channels a lot of upbeat energy into the study of plant biology.

Collaborations play a key role in this pursuit. One category of collaborators consists of graduate students and postdocs who make up the PlantingScience Master Plant Science Team (MPST). Through an increasingly competitive process, applicants from all areas of plant science are evaluated for their research and outreach savvy. Those selected to the MPST are demonstrably capable of helping students develop practical, insightful research skills while investigating the plant themes and teaching modules provided by the PlantingScience program.

PlantingScience is in the midst of making some major

ASPB became an official partner in the PlantingScience project in 2006, has sponsored MPST members ever since, and is proud to announce this year’s winners:

Susan Bush, University of California, Davis
Mon-Ray Shao, University of Nebraska–Lincoln
Lisa Kanizay, University of Georgia
Christine Palmer, University of California, Davis
Lina Castano-Duque, Penn State University
Molly Hanlon, Penn State University
Salehin, University of North Texas
Elena Batista, Louisiana State University
Kranthi Mandadi, Texas A&M University
Mitchell Harkenrider, University of California, Davis
Jennifer Lind, Michigan Technological University
Ines Silva Pires, New York University

continued on page 26
MASTER PLANT SCIENCE TEAM
continued from page 25

website improvements aimed at better supporting the program’s online community. The quality of the virtual connections among program participants is a huge factor in determining the success of a PlantingScience project. The new website is designed specifically to improve the communications among scientist mentors, teachers, and students.

This year’s MPST members will be critical in helping PlantingScience use the updated site features to discover and discuss what makes mentoring work online, how mentors can successfully communicate with students in sixth grade to undergraduate classes, and how mentors and classroom teachers can each benefit from closer relationships.

Catrina Adams, education technology coordinator for PlantingScience, adds, “It’s an exciting time to be a member of the MPST... not only will [members] have a chance to hone... mentoring skills but... [their] input and feedback will also be helping to shape the future of PlantingScience!”

In tandem with their ongoing virtual interaction with students, MPST members also get to betatest web features, give feedback on new mentoring resources, and participate in videoconference webinars focused on improving specific aspects of the program and science education as a whole.

What MPST Members Are Saying
This will be the first time I have been involved in the MPST program, and I am really excited to interact with other students and teachers academically.
—Jennifer Lind

I am thrilled and honored to have been selected for the PlantingScience Master Plant Science Team. I hope my involvement will enrich the education of students and generate an excitement for science.
—Mitch Harkenrider

I’m excited to take part in what looks to be a wonderful, structured way to encourage critical thinking and the use of the scientific process, all while putting a face to science.
—Molly Hanlon

I am a postdoctoral research associate working in the Department of Plant Pathology and Microbiology at Texas A&M University. I have heard great things about the MPST program through my colleague, Dr. Veria Alvarado, a previous MPST mentor, and through the ASPB News. I am excited and looking forward to working with my MPST team and contributing my share of mentoring.
—Kranthi Mandadi

I am looking forward to starting a conversation with the students and to hearing about their ideas. I know that once they put their minds and hearts into something, all the effort will be worth it.
—Lina Castano-Duque

Perks of Joining MPST 2012–2013

A feather in your cap (it’s increasingly tough to earn a spot on this team!)

Free ASPB membership for 1+ year

50% off the registration fee for Plant Biology 2013

Unique professional development and networking experiences

Collaborations that will inspire student researchers and prepare thoughtful citizen scientists

ASPB Encourages You to Become a Biology Scholar!

You Choose the Place to Start!

Apply Now for 2013

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Training Institute
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From Science Education Research to Publication
Training Institute
July 24–26, 2013
Washington, DC

Application Deadline
February 1, 2013

biologyscholars@asmusa.org
Act Now! Help U.S. High Schools and Public Libraries Gain Free Access to ASPB Online Journals

BY KATIE ENGEN
ASPB Education Coordinator

ASPB is pleased to announce a new public access initiative that will give students, teachers, and citizen scientists among the general public free online use of our two high-impact journals, The Plant Cell and Plant Physiology. The Society will provide complimentary access to the journals to any high school teacher, administrator, or public librarian in the United States nominated by an ASPB member (http://journalaccess.aspb.org) as part of its efforts to support general scientific understanding; infuse science curriculum with timely, vetted information; and inspire student research.

Once nominated by an ASPB member, high school and public library personnel can obtain journal access by accepting a simple online site license and providing valid IP addresses for public-use computers in their school or library (readers must be in the physical library or school when they read the journals or download articles from them). At least during its early stages, the program is being offered only to public libraries and high schools in the United States.

ASPB executive director Crispin Taylor noted, “I am delighted that the Society’s leadership has chosen to take this groundbreaking step that further increases public access to ASPB’s journals. What renders this program particularly creative is its emphasis on interpersonal connections between ASPB members and high school educators and students. This approach leverages both the journals and the richness of ASPB’s suite of K–12 resources while also fostering the direct connections between scientists and students that can have such a vital impact on the choices that students make regarding college courses and careers.”

It’s easy to help your community take advantage of this amazing opportunity. Here’s how:

1. Consider colleagues in your outreach network and teachers or librarians in your community who can make good use of this resource.

2. Submit this person’s name and contact information to (http://journalaccess.aspb.org). ASPB will take care of the rest!

3. Incorporate ASPB journal access into your ongoing outreach with these community contacts. You can enhance successful journal use and outreach experiences by pointing out and using the following resources offered by ASPB:
   - How to Read a Scientific Paper is coming soon to http://www.aspb.org/education.
   - So You Want to Work with High School Teachers and Students? http://tinyurl.com/PlantBio-HS-options
   - So You Want to Share Plant Biology Expertise with Your Students? http://tinyurl.com/Outreach-in-HS

By simply helping others take advantage of this offer from the Society, you can foster interest in plant biology among students, parents, and teachers. Please reach out so that your community can make the most of this new initiative from your professional society! ■
The Chlorophyll Content Meter
From Germination Through Maturity

- Fluorescence Ratio Chlorophyll Content
  - technology for hard to measure samples
- Widest reliable measuring range
  - from 41 mg/m\(^2\) up to 675 mg/m\(^2\)
- High degree of correlation to chemical tests
  - determination coefficient of \(r^2=0.96\)
- Single point and 2-30 point averaging
  - statistical analysis and 2 Gbyte of storage
- Direct read out of chlorophyll levels & ratios
  - high resolution color graphics display
Current ASPB Education Committee Chair Kathleen Archer (Trinity College, Connecticut), former committee chair Erin Dolan (University of Georgia), and ASPB Education Foundation member Susan Singer (Carleton College) participated in the NSF-funded Research Coordination Network, Introductory Biology Project (IBP; http://ibp.ou.edu) Summer Conference. IBP hosted this meeting at the headquarters of AAAS in Washington, DC, from June 28 to July 1. The packed agenda included major presentations, informational talks, workshops, poster sessions, and opportunities for exchanging ideas on how to make the introductory biology course the best possible experience for undergraduate students.

About 175 scientists and science educators who are leaders in introductory biology reform attended this important meeting to analyze and share reform research and trends that focus on creative programs, tools and techniques for teaching, and helping students learn biology. With an eye to finding the best options for improving ASPB initiatives in undergraduate education, Kathleen was especially active in networking with the range of experts on hand. Erin served on the panel for the concurrent session, “The Role of Scientific Societies in Transforming the Undergraduate Introductory Biology Experience.” Susan spoke during a major session titled “A Report from the National Research Council on Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering.” All conference presenters and participants were passionate about what works, what doesn’t, and how one can apply these results. Conference presentations, posters, and presenter bios are available at http://ibp.ou.edu. A selection of ready-to-use material includes:

- Deborah Allen, Charlene D’Avanzo, and Susan Elrod. Faculty Development Programs in Introductory Biology: What Works and How Do We Know? (http://tinyurl.com/br6g24r)
- Handout (http://tinyurl.com/cpzejq).
- Ellis Bell. Using Research in a First Year Biology Class to Promote Critical Thinking (http://tinyurl.com/bcyw885).
- Jessica Brown, Jessica. The Good, the Bad, and the Unexpected in Online Learning (http://tinyurl.com/cnp3s3z).
- Todd Carter, Mary Vander Maten, and Susan Finazzo.
- Mike Dougherty. Using Concept Inventories to Advance Research on Teaching and Learning (http://tinyurl.com/b7txhuf).
- Scott Freeman, Alison Crowe, and Mary Pat Wenderoth. Evidence-Based In-Class Activities for Introductory Biology (http://tinyurl.com/aljrrw5).
- Ensuring Quality in Adjunct, Multi-Campus and Dual Credit Instruction (http://tinyurl.com/ czn9raa).

Kathleen Archer

Erin Dolan

Susan Singer

IBP Mind Map

Looking for assessment models, concept inventories, and other teaching resources to enhance introductory biology experiences? Have something to share that can help others with professional development, lab resources, or management issues? Then go to the IBP Mind Map (http://tinyurl.com/b4dfshl)! This interactive tool allows you to find, review, or post practical and potent options for improving your work and your students’ performance.
ASPB Summer Undergraduate Research Fellowship (SURF)

Applications will be accepted
December 1, 2012, through February 12, 2013.

The ASPB Summer Undergraduate Research Fellowships (SURF; http://www.aspb.org/SURF) provide funds to undergraduate students so they can conduct research in plant biology during the early part of their college careers. SURF recipients are expected to present their research at ASPB’s annual Plant Biology meeting in the year following the fellowship award and research completion.

Eligibility
Application is open to all full-time undergraduate students in a degree-granting program. Students completing their second year are preferred, but notably well-prepared first-year students and third-year students who can demonstrate a strong interest in plant biology will be considered. Students at community colleges can apply (but may need to seek a mentor/lab at a different location). Undergraduates needing more or less than the standard four years to earn a degree may still be eligible. International students or students following nontraditional academic calendars are welcome. SURF awards are limited to those without other sources of stipend or salary.

Faculty Mentors
Students must secure a mentor before submitting an application. Mentors must be a member of ASPB, have an ongoing research program of high scientific merit, and demonstrate a commitment to undergraduate education and research. The proposed research project must be pursued in the mentor’s laboratory. Students may work with a mentor at their own institution or at another institution (location logistics must be included in the proposal). Mentors are expected to attend Plant Biology 2014 in Portland, Oregon, with the SURF student.

Applications
A complete application will include a research project statement and personal statement from the student, a research and mentoring statement from the mentor, a letter of recommendation from another faculty member (not the mentor or in the mentor’s lab), and undergraduate transcripts.

Selection Criteria
Competitive student applicants should have high academic achievement, strong motivation and skills for conducting research, and career objectives showing interest in or relevancy to plant biology. Reviewers also will consider the contribution of the project to the mentor’s research program, institutional commitment to the proposed research, and the mentor’s commitment to undergraduate research.

Grant Logistics
Successful applicants receive a $4,000 summer stipend, a one-year membership in ASPB, and $700 (paid to the mentor or institution) for materials and supplies. Each fellowship also provides support for student travel to Plant Biology 2014, ASPB’s annual meeting to be held July 16–20, 2014, in Portland, Oregon. These travel funds are sent only to the 2013 SURF winners who (1) register for the meeting, (2) submit proof of using social media or other outlets to communicate with the public or peers about the SURF project, and (3) author and submit an abstract about their SURF project to present as a poster at the meeting.

Questions?
Contact Katie Engen, ASPB education coordinator (katie@aspb.org; 301-251-0560 x116)

A Successful SURF Applicant’s Sample Timeline

Contact potential mentors: NOW
Discuss research topics: NOW
Request a reference letter: NOW (from college/university faculty who is not the mentor)
Submit SURF application: Several days ahead of the deadline, February 12, 2013 (11:59 p.m. ET)
Look for e-mailed decisions: March 2013
Conduct research: Over 10 consecutive weeks when classes are not in session
Present research: July 16–20 at Plant Biology 2014 in Portland, Oregon
DC Teachers Night 2012
A Growing Tradition for ASPB and the U.S. Botanic Garden

BY KATIE ENGEN
ASPB Education Coordinator

On September 20, during the 6th Annual DC Teachers Night at the U.S. Botanic Garden (USBG), ASPB enjoyed another busy evening presenting an outreach exhibit full of ASPB teaching resources. This event, cohosted by USBG and the D.C. Environmental Education Consortium (DCEEC), literally caters to a crowd of K–12 teachers and museum and park educators by serving up a varied menu of environmental education program booths alongside complimentary beverages and delicious sweet and savory finger foods.

Amid beautiful tropical flora, ASPB volunteers showcased many of the Society’s education resources (also found at http://www.aspb.org/education). Along with sparking interest in critical thinking and inquiry-based learning, the volunteers endeavored to show how plant biology can be easy and useful for teachers to integrate into their STEM or life science curricula. Two new resources that teachers reviewed were

• My Life As A Plant, a coloring and activity book for youngsters created by Alan Jones and Jane Ellis (http://www.aspb.org/coloringbook)
• Free online journal access for high school and public libraries (see page 27 of this issue for complete program details)

Some of the Society’s best booth “resources” were the members who joined executive director Crispin Taylor and education coordinator Katie Engen to volunteer their knowledge and general delight for learning, research, and plant biology with the many teachers (and other exhibitors) who came to talk plant science. Wendy Boss (NSF and NC State University), Stacey Simon (AAAS policy fellow in the Molecular and Cellular Biology Division at the NSF’s Biology Directorate), Joe Isaac (NSF Distinguished Einstein Fellow), and Hemayet Ullah (Howard University) shared a depth and breadth of knowledge that certainly gave the DC teachers who visited the ASPB booth excellent ideas to take back to their learning communities.

Left to right: Wendy Boss, Crispin Taylor, Stacey Simon, Joe Isaac, Katie Engen, and Hemayet Ullah.

Wendy Boss on Outreach

My experience at DC Teachers Night confirmed my desire to work with after-school programs when I retire. I hope that I can help reveal the excitement of science, especially plant science, to the next generation.

At some point, most any educator will experience a lack of appreciation for what she does and cares about in the classroom. So any time I can support those who are in the K–12 trenches, and who may have even greater challenges than we do as university faculty, it is my pleasure to do it and it is very important. I would encourage anyone in the ASPB membership who is interested in outreach to start with a seasoned veteran like those already working with ASPB or to join an ongoing outreach program that will connect you to schools or educational events that welcome and know how to use your expertise.

I know that many retired faculty have done outreach and more of us can do it, too. There is such a need, and it is so easy and rewarding to help. I was fortunate to be located where ASPB could organize things and make my job simple. But no matter the setting or your level of outreach experience, don’t go in timidly! Remember, the in-depth knowledge we have is easy and fun to share at many levels. Everyone can be successful just by sharing “stories” of the wonders of plants and how they function. Students and teachers alike will appreciate how your experiences and detailed insights can bring “classroom” biology to life.

Simon Chan
(1974–2012)

BY SIOBHAN BRADY, LUC COMAI, VENKATESAN SUNDAERASAN, STEVE JACOBSEN, BILL LUCAS, ANNE BRITT, JULIN MALOOF, and IAN KORF

Simon Chan was born in Auckland, New Zealand, in 1974 to Robert and Avril Chan. His younger years were filled with books, bicycles, team sports, and music, as well as family life with his parents and his little sister, Caron. Academically, he excelled. He was a finalist on a nationally televised trivia program and took first place in both music and English national entrance exams. He attended the University of Auckland, graduating in biochemistry, and then went on to UCSF for his PhD, in the lab of Nobel laureate Elizabeth Blackburn. It was there that Simon, supported by an HHMI fellowship, began working on chromosomes, studying how telomerase, DNA repair, and chromatin structure regulate telomere lengthening. After graduation in 2002, Simon joined the laboratory of Steve Jacobsen at UCLA as a DOE Energy Biosciences Fellow of the Life Sciences Research Foundation. During his postdoctoral studies, Simon focused on the novel process of RNA-directed DNA methylation, its effect on gene silencing, and the mechanisms underlying these processes in both plants and animals. He also introduced Steve Jacobsen to the use of genomics approaches for the global analysis of DNA methylation and its influence on gene expression. In 2006, Simon accepted an assistant professor position at UC Davis in the Department of Plant Biology. He began his independent academic career again with awards, including an Early Career Award from ASPB for his outstanding and creative research.

Starting his faculty academic career, Simon made the bold decision to completely switch his research to the largely uncharted field of centromeric function and inheritance, a field in which he had to start from scratch. Simon’s long-term vision was eventually richly rewarded. In 2007, he and his postdoctoral associate, Ravi Maruthalalacham, made a fundamental discovery: transmission of chromosomes containing a modified centromeric histone (CENH3) was disrupted post-zygotically in outcrosses to wild-type plants. Elimination of the genome donated by the CENH3-modified parent resulted in haploids and then di-haploids (doubled haploids), enabling the establishment of true-breeding “inbred” lines in a single generation. This finding, published in Nature in 2010, impacts both our basic understanding of centromeric function and the methods for genetic analysis and line construction used in basic research and applied plant breeding. Additional groundbreaking work, published in Science in 2011 with his collaborators Raphael Mercier and Imran Siddiqi, applied this discovery to clonal reproduction through seeds, that is, artificial apomixis. Simon and collaborators realized that if one parental genome underwent genome elimination and the other parental genome was apomeiotic (it avoided meiotic recombination and reduction), a seed that was a genetic clone of the parent would result. This work constituted an impressive step toward the engineering of apomixis in all crops, and thus toward production of seed-based hybrid varieties that capture the heterosis of optimal F1 hybrids.

Simon was passionate about environmental sustainability, and he worked tirelessly to ensure that his novel findings would be made available to developing countries. With three collaborators from Colombia, Tanzania, and Kenya, he was awarded an NSF-BREAD (Basic Research to Enable Agricultural Development) grant, a joint initiative of the Bill & Melinda Gates Foundation and the National Science Foundation. Research under this grant aimed at translating Simon’s technology to cassava, banana, and plantain, all crop species that are staple foods for the world’s poorest people and that are notoriously challenging to breed. In his last work trip to Africa, he greatly enjoyed bringing his haploid-induction technology to crops that sustain developing countries. In 2011, in recognition of outstanding and exceptionally creative science, Simon was named as an investigator of the HHMI Gordon and Betty Moore Foundation, the youngest recipient among the selected group of scientists who received this award. Simon became a tenured professor in early 2012. He was an accomplished and inspiring lecturer who pursued creative means to share his enthusiasm about genetics and chromosomes (including “pool noodle” meiosis demonstrations) and to develop several new undergraduate courses. He was also a caring mentor to his laboratory members and a wonderful colleague who generously shared his enthusiasm for and knowledge of science, and who worked tirelessly for his department and UC Davis as a whole.

Broadly read, and a master of puzzles, Simon also had a lifelong passion for music and food. He loved jazz and played with mastery piano, saxophone, and guitars, the latter instruments with his band, the Minor Groove. He loved good food. He researched and explored restaurants of all types and meticulously documented his observations in a “scientific log.” He was particularly fascinated by the intricacies of Mexican, Persian, and Malaysian cuisine. Besides enjoying good meals with friends, in his spare time he cycled and played card and word games. Most frequently, continued on page 34
Dring Needham Crowell
(1958–2012)

BY STEPHEN RANDALL, THOMAS BACH, JOE CHAPPELL, and RICK AMASINO

The plant biology and biochemistry communities lost a dear friend and dedicated contributor on June 30, 2012—the day Dring Needham Crowell, 54, passed away. Dring was a highly regarded faculty member at Indiana University–Purdue University Indianapolis (IUPUI) from 1991 to 2008, where, in addition to developing his research program, he helped pioneer a new degree program in Forensic and Investigative Sciences. In 2008, Dring joined the faculty at Idaho State University, where his wife, Pamela L. Crowell, was appointed the vice president for research. Prior to taking up his faculty positions, Dring earned a BS degree in chemistry from Illinois State University and a PhD in biochemistry from the University of Wisconsin–Madison, where he and Pamela met. One of Dring’s greatest legacies is the innovative research program he championed with support from the National Science Foundation, the U.S. Department of Agriculture, and the National Institutes of Health, which resulted in more than 50 publications.

Dring began his graduate career studying lipopolysaccharide biosynthesis and identifying the gene encoding lipid A disaccharide synthase in the lab of Chris Raetz (University of Wisconsin), and then moved to working on cytokinin-regulated gene expression in plants as a postdoc with Rick Amasino, also at the University of Wisconsin. As a beginning assistant professor at IUPUI, Dring teamed up with his close colleague Stephen Randall to provide the first documentation for the existence and biosynthesis of prenylated proteins in plant cells, then an emerging concept for posttranslational modifications associated with proteins regulating various facets of a cell’s life cycle. That work resulted in a highly cited article published in 1993 (The Plant Cell, 5(4):433–442). The prenylation process itself intrigued Dring, so he and his coworkers then began a series of in-depth studies to elucidate all the players and details for this unique but ubiquitous process. A key part of that effort led to another pivotal paper published in 1994 (The Journal of Biological Chemistry, 269(41): 25251–25254). Other investigators in the field often cite his development of a facile method to identify prenylated proteins in a cell or organism as a major step toward the ultimate cloning of the respective genes.

Dring’s contributions to the protein prenylation field grew in the subsequent years. For example, after characterizing two genes encoding prenylcysteine α-carboxyl methylase (ICMT), his lab demonstrated that methylation of isoprenylated proteins was necessary for ABA signaling, and thus a potential target for altering ABA sensitivity and drought tolerance in plants. Together with his wife Pam, Dring also contributed to our understanding of the role of protein prenylation in human cancers. In the recent past, Dring’s studies on cytokinin action and protein isoprenylation in tobacco BY-2 cells led to a collaboration with the group of Thomas J. Bach at the University of Strasbourg, which included reciprocal exchange visits between Indiana and France. Upon moving to Idaho State, Dring continued his work on isoprenoid metabolism, including efforts to apply his insight in ABA signaling to produce a drought-resistant potato.

Dring was highly regarded as a scientist, an educator, a colleague, and a friend by all those who knew him. He was a firm believer in being intimately involved with his research and would often be found at the research bench, working on his “own” project or assisting students with theirs. Throughout his career, he collaborated with many scientists, and his expertise in writing was especially appreciated by his collaborators. One of us fondly remembers the Dring truism, “If you can’t fix it, delete it.” In the classroom and laboratory, he taught hundreds of students and inspired many to become scientists, physicians, and teachers. Dring was an outstanding teacher, consistently receiving top student evaluations despite the reputation of his molecular biology course as being the toughest in the department. Many students remember him for his fine analytical mind and empathy. Colleagues and students alike fondly remember his annual holiday gatherings.

In addition to his scientific contributions, Dring was a talented guitarist, composer, luthier, woodworker, writer, and cook. In Dring’s last year, he built seven guitars that are strikingly beautiful and acclaimed for their quality and sound by accomplished guitarists. His friends and colleagues enjoyed making music with him as much as he did with them. At his memorial service, one of Dring’s original compositions was played, as was one of his recently constructed guitar creations. Dring is missed by his family, friends, and colleagues.
Oblivious and provocative questions. He was devoted to his parents and sister and was a proud uncle to his nieces Rose and Clara.

Several years ago, Simon was diagnosed with an autoimmune liver disorder. While he refused to let this condition affect his work and goals, Simon’s health deteriorated rapidly during June and July of 2012. On August 22, Simon died surrounded by his friends and family. He was 38 years of age. All who were able to meet and interact with Simon were struck by his uncommon humility, kindness, generosity, passion, and enthusiasm for life. We greatly miss his advice, insight, and friendship, although we are comforted that he lived fully and has left a long-lasting legacy. As a tribute to Simon Chan’s remarkable accomplishments and lasting impact on the field of basic and applied plant biology, a campaign will be launched for a memorial endowedment at UC Davis in the Department of Plant Biology, College of Biological Sciences, with the long-term goal of funding a chair.
The Molecular Life of Plants presents students with an innovative, integrated approach to plant science. It looks at the processes and mechanisms that underlie each stage of plant life and describes the intricate network of cellular, molecular, biochemical, and physiological events through which plants make life on land possible.

Richly illustrated, MLOP follows the life of the plant, starting with the seed, progressing through germination to the seedling and mature plant, and ending with reproduction and senescence.

MLOP’s “seed-to-seed” approach will provide students with a logical framework for acquiring the knowledge needed to fully understand plant growth and development.

MLOP offers students a comprehensive, integrated introduction to the subject across a variety of disciplines including plant science, biological science, horticulture, and agriculture.

Available in hard and soft cover as well as electronic formats. The accompanying website will feature downloadable versions of all illustrations.

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