ASPB News

THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

Volume 32, Number 6
November/December 2005

President's Letter

ASPB on My Mind

Mike Thomashow

As my year as president-elect transitions into my year as president, I would like to share with you some of the thoughts that are running through my mind regarding our Society. The first and foremost is that ASPB, in more ways than I had previously fully appreciated, is truly a terrific organization that does much to serve our plant biology community and enrich our professional lives. This is accomplished in multiple ways. Of course, there is the publication of our two premier scientific journals, *Plant Physiology* and *The Plant Cell.* There is the annual ASPB Plant Biology meeting that, through plenary and concurrent sessions, brings us up to speed on the latest developments in a variety of areas basic to plant biology and provides a forum for young scientists to present their findings on an international stage. There are also the new, smaller, specialty meetings on specific hot topics and the efforts of the Society to identify and honor with a variety of awards those individuals who have made outstanding contributions that have furthered our scientific understanding of plant biology or who have provided leadership in agriculture or education in the plant sciences.

Another very important way in which the Society serves the membership and plant biology community is through the work of the numerous ASPB committees. I don't have space here to write about each of these committees. However, as examples, there is the Public Affairs Committee, which provides a voice on behalf of the entire plant biology community to Congress, funding agencies, and elsewhere where our interests as plant biologists are concerned. There is the Education Committee, which promotes plant biology education and outreach in a variety of venues including workshops and booths at the annual Plant Biology meetings and participation at national educational meetings addressing science and technology issues. And there are the Minority Affairs and Women in Plant Biology committees, which are dedicated to broadening the participation of our citizenry in plant biology research and education. The important work of these committees is accomplished through the dedication and hard work of the Society's membership and the absolutely first-class ASPB staff stationed at "headquarters" in Rockville, Maryland.

For more than three-quarters of a century, ASPB has had a role in helping the plant biology community fulfill its aspirations. There is every reason to believe that this will continue to be the case long into the future. However, there are always new challenges. One relates to the evermore sophisticated technologies that are being developed and the impact that they can have on the membership of our Society. When I was young and had to walk all those tough miles to school in the horrible weather of Los Angeles, it was a part of the culture to join the professional society that most closely represented your scientific and educational interests. In addition, there was the added benefit of receiving the journal in which you found most of the articles that were of interest to you. This saved you the time of trudging back and forth to the library. But now, through advances in technol-

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

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Deadline for March/April 2006
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ASPB News

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ASPB Officers Assume Posts for 2005–2006

New ASPB officers and committee members assumed their responsibilities October 1.

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Allan Showalter, *Midwestern*
Rakesh Minocha, *Northeastern*
Mel Oliver, *Southern*
Thea A. Wilkins, *Western*

2005–2006 Awards Committees

Following is a list of the membership of the ASPB awards committees for 2005–2006 as announced by President Michael F. Thomashow. Members serve for three award cycles unless otherwise noted.

Adolph E. Gude, Jr. Award
Deborah P. Delmer (06), *chair*
Lloyd T. Evans (07), *past winner*
Andrew D. Hanson (07)
Louise E. Anderson (08)
Julian I. Schroeder (10)

Charles Albert Shull Award
Steven C. Huber (07), *chair*
Krishna K. Niyogi (06), *past winner*
William J. Lucas (07)
Natasha V. Raikhel (08)
Elizabeth Vierling (08)

Charles F. Kettering Award
Gerald E. Edwards (08), *chair*
Gayle Lamppa (06)
Elisabeth Gantt (10)
Keith Alan Mott (10)

Charles Reid Barnes Life Membership Award
Charles A. West (06), *past winner*
Kendal D. Hirschi (07)
Henry T. Nguyen (07)

Corresponding Membership Awards Committee
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Judy Callis (07)
Heven Sze (07)
Christopher J. Staiger (08)
Chentao Lin (09)

Dennis R. Hoagland Award
Peggy G. Lemaux (06), *chair*
Donald R. McCarty (06)
Niels C. Nielsen (06)

Early Career Award
Sabeeha S. Merchant (07), *chair*
Shin-ya Miyagishima (06), *past winner*
Steven M. Theg (06)
Gregg Alan Howe (08)
Harry J. Klee (08)

Excellence in Teaching Award
Anita S. Klein (06), *chair*
Susan R. Singer (07), *past winner*
Deborah K. Canington (06)
Donna E. Fernandez (06)
Sabine J. Rundle (09)

Martin Gibbs Medal
Joseph R. Ecker (07), *past winner*
K. G. Raghothama (07)
Richard B. Meagher (09)
John A. Browse (10)
Sally A. Mackenzie (10)

Stephen Hales Prize
Maarten J. Chrispeels (06), *chair*
Bob B. Buchanan (06), *past winner*
George Eric Schaller (06)
Mel Oliver (07)
Richard D. Vierstra (07)

ASPB/AAAS Mass Media Fellow Returns Drumming a Journalist's Beat

"Be sure to wear long pants and sturdy boots," was the last thing Duke Ph.D. student Adriana Sutton-Greer said as we hung up the phone in anticipation of our interview the following day. I'd been told before my arrival to observe the foreign protocol of "business casual" this summer and was not anticipating the need for mud boots.


Sarah Nell Davidson

The next day I made the drive to Durham in my A/C-less jalopy of a grad student car, donning long pants in the North Carolina heat and implementing a popular technique we used as kids when we'd outgrown last year's snow boots—rubber bands and plastic bags over sneakers. (My aunt once resolved that she would never again date a man who didn't own a pair of boots. It was as if owning boots was an easily quantifiable character indicator that could be assessed before undergoing the arduous experiment of dating.)

I left my car and joined the postdoc and Ph.D. student who would spend the day showing me the Duke Wetlands Projects, rubber bands and plastic bags in hand. I considered at this moment that perhaps I should consider only a career that demanded at least on occasion wearing sturdy boots—a sure sign of adventure.

Once inside the SUV that would take us to the wetland site where they were conducting their research, my informants began to explain their work. I listened attentively, scribbling down notes as the graduate student explained to me how the nitrogen cycle works. In my new role as journalist—no longer the plant biology Ph.D. student—I didn't let on that the nitrogen cycle was the subject of my undergraduate thesis research and my first couple of years in graduate school. I had to hear it from her—or I wouldn't get the quote I needed for my story.

Ten weeks as a AAAS Mass Media Fellow sponsored by ASPB brought me to some of North Carolina's shrines of science such as Duke's wetlands. The program, now in its 31st year, is part of AAAS's initiative to increase public understanding of science by training graduate students in science and engineering to become better writers. This year 18 graduate students from fields as diverse as math and clinical psychology left their lives embedded in research to dive head first into an unfamiliar world as science journalists.

The sites ranged from public radio stations to magazines, but most of us were assigned to a pretty impressive collection of the country's daily papers that we would otherwise never qualify to intern with.

My assignment took me to the *Raleigh News and Observer,* the major daily newspaper for the eastern half of North Carolina with a special focus on the Triangle. Having grown up in the Midwest and having spent most of my adult life west of the Continental Divide until I came to Cornell, the Southeast was a region I considered unchartered territory. North Carolina is a contrasting mix of highly educated Triangle residents surrounded by socioeconomically diverse urban populations and a good fixin' of country folk. It's a place where iced tea can send you into diabetic shock, "bubbles" are a unit of liquid measure, and BBQ is a regional form of identity.

My expectations of the newsroom as buzzing with crass reporters typing away and too busy meeting their deadlines to show much interest in an intern were immediately debunked. Rather, I encountered a friendly group of interesting people all eager to help show me the ropes.

Because of the mid-sized nature of the paper, I was able to occupy many roles at the *N&O* and was immediately sent out on my third day to cover a study at Eastern Carolina University. As more of the regular reporters went on vacations, opportunities to write stories outside science flooded my way—which broadened my view of the newsroom and got me pounding the pavement of North Carolina to talk to an eclectic mix of "Tarheels," all living very curious and remarkable lives.

During my first week I covered two of science's big ones, with late-afternoon assignments on nanotechnology and stem cells that had to be well researched, written, and turned into perfectly trimmed articles in roughly the same amount of time it takes to run a standard PCR program.

I spent a week on what I came to call the "bite beat." Two days on the North Carolina coast speaking to shark experts and emergency medical personnel about the incidence of sharks and shark bites on the Carolina coast provided me with some good material to work into a story following the shark attacks in Florida. Then I switched gears and headed inland to speak with health experts on the incidence of tick-borne diseases such as Rocky Mountain spotted fever.

I pitched an idea and got the editor's approval to do a story on a plant biologist at UNC–Chapel Hill who is a leader in our field and a member of ASPB. But alas, plant biologists are so hot that I was met with competition—the full-time science writer at the paper claimed dibs on it.

Other attempts were more fruitful. I pitched a story that landed on the front page about the severity of this year's Japanese beetle infestations on the grapevines that decorate the Yadkin Valley. Another successful pitch allowed me to write a story about the science behind the Theremin, an unusual instrument that was being celebrated at a festival in Asheville, bringing my byline to the cover page of the Arts & Entertainment section.

The opportunity to meet and interview so many scientists about the successes of their life works was extraordinary for a young scientist beginning to think about post-graduation career choices. After asking one scientist about variables that were seemingly lacking in her experimental design, she remarked, "That is such a good question! You should be a scientist!"

Perhaps part of what I find so satiating about journalism are some of the same attributes that drew me to science—researching a topic, asking the right questions, and finally formulating a story.

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Annual MAS–ASPB Crab Feast

The Mid-Atlantic Section's annual Crab Feast held September 30 at ASPB headquarters was a great success. Ninety people attended, consisting of MAS–ASPB members and their guests from a number of local colleges and universities, USDA, NSF, NIST, NASA, and ASPB. The crowd consumed seven bushels of hot spiced crabs delivered by Joe Sullivan (former MAS–ASPB Secretary–Treasurer) while enjoying live music provided by Natural Selection, the band of Albert and Ellen Torzilli from George Mason University. Mark Holland (MAS–ASPB Secretary–Treasurer) cooked up countless hotdogs and hamburgers, and the little ones toasted marshmallows over the fire. Many thanks to everyone who participated!

ASPB and JSTOR Collaborate on Digital Archive

ASPB has recently begun an exciting collaboration with JSTOR, the not-for-profit online digital archive. With JSTOR's help, we are planning to make the back issues of *Plant Physiology* and *The Plant Cell* available for searching and browsing online through the JSTOR website. Currently, JSTOR is seeking the complete back runs of *Plant Physiology* and *The Plant Cell* for digitization. To help facilitate their production process, ASPB is requesting that members donate or lend any back issues they may have to JSTOR. To learn more about donating back issues, please contact

Jason Glover
JSTOR Issue Acquisitions Specialist
(734) 998- 9100; (888) 388-3574
jglover@jstor.org

The full digital archive of both journals in searchable PDF format is also available at HighWire Press (www.aspbjournals.org) and PubMed Central (http://www.pubmedcentral.nih.gov/).

JSTOR is an independent not-for-profit organization with a mission to create a trusted archive of scholarly journals and to increase access to those journals as widely as possible. Visit www.jstor.org for more information.

President's Letter
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ogy, many of us can, through the subscriptions of our institutions, read and print articles from not only *Plant Physiology* and *The Plant Cell,* but countless other journals as well. So, given this, why join ASPB? Well, I hope the activities that I briefly touched on above offer a partial answer to this question. The scientific journals published by ASPB are at the core of our Society's contributions to the plant biology community. However, there are many other ways in which the entire community benefits and is enriched by the activities of ASPB. By being a member of ASPB, you help support these efforts.

There are additional issues on the horizon that are very important to our Society. Perhaps the most important of these is Open Access, the "free availability and unrestricted use" of published research. As Don Ort, the editor-in-chief of *Plant Physiology,* wrote in his September 2005 editorial, Open Access is "the preeminent force driving change in academic publishing." Such change poses challenges. But it also presents opportunities. I look forward to discussing this and other issues with you in future columns. For now, I'll close by thanking you for the honor and opportunity that you have given me to serve our Society.

Michael F. Thomashow
thomash6@msu.edu

ASPB/AAAS Mass Media Fellow
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It's sweltering at the bottom of a brick manufacturer's quarry. I lean against a huge boulder and put down my notepad to take a drink of water. Science writer Catherine Clabby and I have been out all morning at the heels of a local paleontologist who is striking Triassic gold unearthing fossils. Today I wear prescribed long pants and steel-toed boots as we venture among the rock piles trying to get a sense for what a day in this scientist's life entails. I'm not writing the article. I'm here to observe Cathy's approach to an interview and how she will convert the scene before us into the words that will contextualize her article.

Our paleontologist has returned from the truck with a large stone cutter that he uses to cut out a smaller piece of rock that contains the fossil. Donned with goggles and OSHA-approved safety gear, he fires up the saw, causing plumes of dust to erupt from the rock. I watch Cathy watching him. I think about the differences between doing science and writing about the science that other people do.

This summer, I watched divers flirt with deadly sharks, met a man who uses his Ph.D. to work on improving North Carolina's health care system for the poor, heard a Russian musician play Chopin by waving her hands in front of a proximity sensor, trucked through fields with seasoned tobacco farmers, and spent hours listening to the poetry of a man who gives four ears of corn to anyone at the Raleigh State Farmers Market who promises to do a good deed—because "doin' good is good." Although I have not exactly walked in their boots—I have my own now—my summer as an *N&O* science writer has offered me an incredible opportunity to learn the craft of sharing the lives of Carolinians with the average reader of a daily newspaper.

It is my goal to use my years of training in science to write for the mass media. The experiences I had this summer learning the craft through the ASPB/AAAS program have me well on my way. Later this month I will pack my boots, notepad, and malaria pills and head out to tell the story of transgenic papaya as a part of my interdisciplinary thesis in plant biology and science writing.

Sarah Nell Davidson
snd2@cornell.edu

CALL FOR ABSTRACTS

PlantBiology2006

Joint Annual Meeting
of the American Society of Plant Biologists and the Canadian Society of Plant Physiologists— la Société Canadienne de Physiologie Végétale

Saturday, August 5, through Wednesday, August 9

Hynes Convention Center, Boston, Massachusetts, USA

The **Plant Biology 2006** format will include six Major Symposia and up to 28 Minisymposia based primarily on the abstracts submitted under the topic categories listed on the right. The Program Committee determines the titles and contents of the Minisymposia after reviewing the submitted abstracts. Poster presentations are also expected for those abstracts selected for presentation in Minisymposia. Suggestions for Minisymposia topics are welcomed and should be sent to Wendy Sahli, wendys@aspb.org, or Plant Biology 2006 Abstracts, 15501 Monona Drive, Rockville, MD 20855 USA.

SUBMISSION DEADLINES

- Abstracts must be submitted via the web at www.aspb.org/abstract not before January 1, 2006.
- To be considered for inclusion in a Minisymposium, submit abstract by February 28, 2006.
- For Poster sessions only,* submit by April 3, 2006.
- For inclusion in the Program Book, submit by May 2, 2006.

* The online submission form provides an author the opportunity to request that an abstract be presented only by poster.

On the reverse of this page are the instructions for submitting your abstract electronically. It is critical that you read and follow these instructions carefully. If you have any questions, contact Wendy Sahli at wendys@aspb.org or 301-251-0560, ext. 123.

Remember the following guidelines:

- A member may submit or sponsor only ONE research abstract and ONE education abstract.
- A non-refundable $50 fee will be required for each abstract (can be credited to registration fee).
- Registration will be required by the last day of pre-registration of June 15, 2006 or your abstract will be pulled from the online listing and no poster space will be reserved.
- The body of your abstract cannot exceed 1,800 characters (including spaces).
- DO NOT include any graphics or tabular material in the body of your abstract.
- Follow the online instructions for inserting special characters and super/subscripts.
- Proof your abstract, double-checking any special characters.
- Press the "Submit" button. Acknowledgment will be sent by email.
- Select a topic category from the list to the right.
- If you do NOT wish your abstract to be considered for oral presentation in a Minisymposium, please indicate so on the online form.

The abstracts and program details will be available for viewing and searching online in April 2006. The web site will make it possible for you to prepare and print out a personal itinerary to guide you at the meeting long before you arrive. This system will work best with a forms-capable web browser. We strongly recommend Netscape or MS Internet Explorer, version 5.0 or higher.

Abstract Topic Categories

Environmental physiology
Global change
Tree biology
Legume biology
Integrative plant physiology
Heavy metals and phytoremediation
Oxidative stress
Salinity
Temperature responses
Water relations
Membrane transport
Mineral nutrition
Photosynthesis (light)
Photosynthesis (carbon)
Plant-pest interactions
Plant-pathogen interactions
Plant-symbiont interactions
Cell walls
Organelle biogenesis
Protein targeting and vesicular trafficking
Cell division
Cytoskeleton structure and dynamics
Education and outreach
Metabolism
Secondary metabolism
Lipids
Growth
Biophysics
Vegetative development
Evolution of development and physiology
Reproductive development
Seed biology
Rhythms
Photomorphogenesis
Tropisms
Intracellular signaling
Cell-to-cell and long-distance signaling
Hormone synthesis and metabolism
Mechanisms of gene regulation
Protein modification and turnover
Epigenetics and gene silencing
Genome evolution
Modeling and computational biology
Large-scale technologies and resources
Emerging technologies
Plant biotechnology
Metabolic engineering
Biotech risk assessment
Late and moved abstracts*

*All abstracts received by April 3, 2006, will be assigned to a thematic poster session, but abstracts received later than April 3, 2006, will be presented in the late/moved category. Abstracts received after May 2, 2006, will not appear in the program book.

CALL FOR ABSTRACTS

PlantBiology2006

Joint Annual Meeting
of the American Society of Plant Biologists and the Canadian Society of Plant Physiologists— la Société Canadienne de Physiologie Végétale

Boston, Massachusetts, USA, Saturday, August 5, through Wednesday, August 9

FOLLOW THE INSTRUCTIONS EXACTLY.

HOW TO SUBMIT AN ABSTRACT TO PLANT BIOLOGY 2006

Submit Abstract via the Web (DO NOT SEND VIA FAX, MAIL, OR EMAIL)

1. Select an abstract topic category from the list on the previous page. A member may submit or sponsor only one research poster abstract and one education poster abstract. Submitting or sponsoring member ID will be required.
2. A U.S. $50 non-refundable fee is required for each abstract. This fee can then be credited to the presenter's registration fee when registering for the meeting. The fee may be transferred with the permission of the initial abstract submitter.
3. Do not include any graphics or tabular material in the body of your abstract.
4. Access http://www.aspb.org/abstract/. You must have a forms-capable browser (for example, MS Internet Explorer or Netscape, version 5.0 or higher).
5. If you would not like to be selected for a Minisymposium, please indicate that on the online form. Otherwise, your abstract is automatically considered for a Minisymposium if submitted by February 28, 2006.
6. Detailed instructions will be provided on the screen. Enter the information called for in each field. When using special characters (superscripts or subscripts, italics, bold, or Greek letters), you will be asked to enter some simple text mark-up codes. The codes will be provided in the instructions on the screen. Those using Internet Explorer browsers 5.0 or higher have button functions for inserting the characters. The system will provide an immediate proofing copy to ascertain that you have entered the codes properly. The system will count the characters (minus the codes) and will not permit you to enter an abstract of more than 1,800 characters (including spaces).
7. Proof your abstract, double checking any special characters or symbols.
8. After proofing, press the "Submit" button. Acknowledgment will be sent to you by e-mail.

The meeting format for Plant Biology 2006 will include Poster presentations, Major Symposia, and Minisymposia. All abstracts must be submitted as Poster presentations in one of the Poster session categories. The Program Committee will then review the poster abstract submissions and select a limited number of abstracts to compose the Minisymposia. If you wish to have your abstract considered for a Minisymposium presentation, submit your abstract by February 28, 2006. If your abstract is chosen for a Minisymposium presentation, you will be contacted by April 3, 2006.

Address any questions to Wendy Sahli, wendys@aspb.org or 301-251-0560, ext. 123.

Addressing Ethical Standards: Anti-Plagiarism Software

In 2002, the ASPB Executive Committee instructed the Publications Committee to begin to develop a comprehensive set of guidelines to address ethics in publishing. This exercise had two goals. One goal was to develop procedures for the handling of allegations of ethical violations in the Society's publications. The second and more important goal was to educate the Society's membership as well as authors, editors, reviewers, and staff associated with the Society's journals. The ethical issues associated with scientific publication are many and often subtle, and we were motivated in the spirit of "an ounce of prevention is worth a pound of cure."

Of all the ethical issues we have considered to date, plagiarism is arguably the most complicated. Our ASPB policies define plagiarism as "taking material from another's work and submitting it as one's own." We last addressed plagiarism in this column one year ago (*ASPB News,* November/December 2004, pages 10–11). Our article emphasized that ASPB holds authors—not the Society or its editors and reviewers—responsible for ensuring that all the ideas and findings included in a manuscript are attributed to the proper source. We also referred to our role as steward of what constitutes ethical conduct and, conversely, ethical misconduct and our commitment to continue to strive to educate all the parties in the publishing process. Education is paramount, because if there is one thing we have learned after dealing with several cases of alleged plagiarism over the past year, it is that plagiarism can be a bit of a gray area, not just for authors but for editors and publishers as well.

Help may be on the way, in the form of plagiarism-detection tools adapted for the scholarly peer review process. The May 19, 2005, issue of *Nature* noted in an article titled "Taking on the Cheats" that academic publishers hold hope that the software already used by universities to catch cheating students can soon be adapted to catch instances of plagiarism, intentional or otherwise. Critically, no totally reliable plagiarism-detection tool exists, even today. Bob Campbell, president of Blackwell Publishing, suggested in *Nature* (p. 259) that the overall solution probably will "come when publishers collaborate on industry-wide detection systems." The May 19, 2005, edition of the *Chronicle of Higher Education* covered the same topic—using software to uncover plagiarism and self-plagiarism.

Even if there were reliable and sensitive plagiarism-detection software, many issues would remain to be addressed. For example, how much copying is legitimate? Clearly, the reuse of large amounts of others' text constitutes plagiarism. But what should one think about copying short passages from the author's own earlier work, such as commonly occurs in the Methods section? After all, how many ways are there to describe the growth conditions used for one's seedlings or the procedure to detect a protein by immunohistochemistry? In the *Nature* article it is suggested that some journals set a quantitative limit whereby the amount of text that can be reused is limited to about 30 percent. This may be utilitarian, but it seems curious and arbitrary that 25 percent of copied text might be deemed acceptable whereas 30 percent might not. Indeed, two authors who copied the same number of words could find themselves on opposite sides of that border if one author simply was more verbose and thus diluted their plagiarized content below the threshold! No, this is not a simple issue at all.

A second issue is the role of ASPB as gatekeeper or policeman: Should the Society or its journals routinely screen all submissions for plagiarism? An alternative approach might be to provide access for all authors to such software at the ASPB journal sites (in the Instructions for Authors sections) to facilitate authors screening their own work. This "honor system" would be in keeping with a role as stewards and educators. The journals would then address allegations of plagiarism that emerged during the review process or after publication, much as is the case at present. Again, these are challenging issues that we would like the Society's membership to consider.

So, in our ongoing spirit of education, we wish to draw our members' attention to this issue of plagiarism. Our intent is not to define what is and what is not acceptable, but to encourage the consideration and discussion of this issue among our members and their colleagues. It would make an excellent topic for your next group meeting! To inform these discussions, the first few paragraphs of the *Nature* article are reprinted below, by permission, with a link to the full article appended.

References

Carlson, S. (2005, May 19). Journal publishers turn to software to root out scholarly plagiarism. *Chronicle of Higher Education; http://chronicle.com/daily/2005/05/2005051901t.htm.*

Giles, J. (2005, May 19). Taking on the cheats. *Nature* 435:258–259.

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SPECIAL REPORT

Taking on the Cheats

The true extent of plagiarism is unknown, but rising cases of suspect submissions are forcing editors to take action.

—Jim Giles reports

The fight against plagiarism is about to take a decisive turn. Academic publishers have told *Nature* they hope that software designed to catch cheating students could soon be used to unmask academics who plagiarize other researchers'—or their own—work.

Big publishers such as Elsevier and Blackwell, which between them publish more than 2,500 journals, have been prompted to act by reports that plagiarism is becoming more common. "We're hearing about it more frequently from editors," says Bob Campbell, president of Blackwell Publishing in Oxford, UK.

Self-plagiarism, in which authors attempt to pass off already published material as new, is a particular problem. In an increasingly competitive environment where appointments, promotions and grant applications are strongly influenced by publication record, researchers

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Teams and Genes

Team Management

Once upon a time, a single scientist could carry out a research project on her (or his) own. But those days are long gone. These days, teams of scientists are the norm. A team comprises a mix of older and younger scientists, sometimes from different departments or universities. Usually, though, the team members are almost clonal; they all have similar backgrounds, interests, and goals. Even worse, they think the same thoughts. These teams are easy to manage and may achieve their goals, but the outcomes can be narrow and the biological and agricultural significance limited.

At present, teams are rarely led by women, a historical situation that should change as the proportion of women in science increases and the average age of women scientists increases. Will women manage teams differently from men?

There are three ways of managing teams: consensus, democracy, and dictatorship. With consensus, everyone agrees. With democracy, everyone has a say or vote and the view of the majority prevails—an arrangement liked by the majority but not necessarily the minority. With dictatorship, the team leader makes all major decisions, maybe after consultation with selected team members.

The consensus approach may be more attractive to women than to men. It has the happy outcome of general agreement within the team, but it takes more time and patience than the other two approaches. The more diverse the team, the slower the decision-making process, and some team members may become impatient.

Delegation of important tasks and decisions is an attribute of successful team management, but it is likely to occur only with democratic management styles. I have noticed that both consensus managers and dictators find it difficult to delegate, for completely different reasons—the fomer to keep everyone happy, and the latter to keep control.

Teams of Genes

Genes work in teams; the activity of any one gene requires the cooperation of a suite of other genes. This means that altering the expression of one gene may not significantly affect plant growth or metabolism, even if it is a transcription factor. Identifying and removing one limiting factor to a plant process can reveal a limitation by another factor. An example at the whole-plant level is temperature and light: Raising the temperature can make a plant grow faster, but the light level may have to be raised to provide sufficient photosynthate for the faster growth. At the cell level an example is ion transport rate and proton pumps: Upregulating an ion transporter such as a sodium–proton exchanger may increase the rate of sodium transport across a membrane, but the proton pumps will have to work faster to maintain the difference in proton concentration that drives the exchanger. Whether ion transport is limited by the activity of the transporter or the regeneration of the proton gradient is difficult to know, but it is obvious that one cannot work without the other.

Transgenic experiments often have disappointing results. Transformation with genes to synthesize compatible solutes or osmolytes can result in only low solute accumulation and have little or no effect on growth of plants in dry or saline soil. Explanations lie at the biochemical level: The failure of proline to accumulate in response to overexpression of a proline-synthesizing gene can be due to feedback inhibition, and the failure of glycine betaine to accumulate can be due to a lack of the precursor choline. The solution has been to modify the proline-synthesizing gene in the one case and to upregulate the synthesis of choline in the other. However, this might only reveal another limitation farther up the biosynthetic chain, or it might reveal a limitation at a higher level of organization—the whole plant. For example, organic solute production might be limited by the rate of carbon supply, as stomates close to maintain leaf water status in dry or saline soil and supply of photosynthate falls accordingly.

The effects of altered expression of a single gene might also be felt down the biochemical chain and on other interacting genes. Microarray analyses show that the expression of one gene affects the expression of many other genes. This might be expected if the mutation is in a signaling pathway, but not if it is a very specific transporter. Yet a knockout mutant in a sodium–proton exchanger changed expression of hundreds of genes. These results indicate that ion exchangers may play important roles in ion or pH homeostasis, as well as salt tolerance, and be part of a metabolic network.

Team Effectiveness

In my experience, the most effective teams of people are those in which there is much networking, interaction, and mutual trust. The team leaders who are remembered fondly and with respect by their students and colleagues are those who have mentored young scientists and made sure that individual efforts are recognized and not lost in a large project. Large projects are now common, as solutions to major problems require extensive resources in terms of people and equipment.

A major agricultural or environmental problem is not going to be solved by a bunch of people working in a laboratory, no matter how good the team. It will be solved only if the laboratory studies are integrated with work at the actual source of the problem. For example, if we are searching for genes that will enable a plant to adapt better to drought or salinity, our work will provide useful solutions only if it is done with an understanding of the actual problem and in conjunction with plant breeders or agronomists working on the problem in the field. Feedback from these people will tell us that we cannot simulate drought by growing plants in polyethyl-

ene glycol or leaving them to dry on a bench. And we cannot simulate soil salinity by dunking the plant roots in high concentrations of NaCl and measuring changes that occur before they die.

Useful solutions to major problems are perhaps beyond the ability of any one team in isolation and require cooperation between teams, or with individuals working in other agencies closer to the source of the problem. My team members (like the other scientists I work closely with) are individuals from different backgrounds, ranging from physiology to biochemistry, molecular genetics, and molecular biology. We have essential links to field-based scientists (breeders and agronomists) and to farmers who support our research efforts and offer their farms for research trials. To contribute to solving society's problems, we need to ensure that our laboratory's work is directly connected with the people who will use the products of our research.

To operate effectively within such complex frameworks requires a whole range of skills that are not taught in science courses and that do not come easily to most of us, female or male. These include personal communication skills such as listening, tact, consideration, and acknowledgment of other people's efforts. We all have to work hard at acquiring the skills that are necessary for effective teamwork.

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People

Hangarter, Sterling Win Visualization Awards

The National Science Foundation and Science magazine recently announced the winners of the Science Engineering Visualization Challenge, in which the nation's scientists were asked to come up with ways to make science visually appealing.

Top honors go to Indiana University at Bloomington professor and ASPB past president Roger Hangarter and documentarian Samuel Orr for their short film about Brood X periodical cicadas.

Hangarter and Orr's short film, *Return of the 17-Year Cicadas,* won in the Non-Interactive Media category for its visual impact, its novel use of cameras (mixture of live and time-lapse footage), and its scientific accuracy.

A streaming version of the video is available at http://www.iuinfo.indiana.edu/bem/media_relations/cicadas.rm. (The video requires RealPlayer software to view.)

Hangarter's interests in science, art, and education led to an IU School of Fine Arts exhibit titled "s*L*owlife" (http://dennis4.fatcow.com/lowlife/slowlife_intro.html) and the website "Plants-in-Motion" (http://plantsinmotion.bio.indiana.edu), which was featured in *Science* NetWatch in 2002 and was awarded a MERLOT Classic Award for Biology in 2004 (*ASPB News,* September/October 2004, page 7). Hangarter's s*L*owlife exhibit debuted at the U.S. Botanic Garden on October 26, 2005 (see story on page 25).

Those interested in obtaining high-quality video or in talking to Hangarter and Orr should contact David Bricker, IU Media Relations, at 812-856-9035 or brickerd@indiana.edu.

In addition to Hangarter's first-place award, ASPB member Tracy Sterling of New Mexico State University captured the honorable mention award in the Interactive Media category. She received the only award presented in that category.

Science reported September 23 that Sterling and animator Matt Byrnes created with "Transpiration: Water Movement Through Plants" a friendly, interactive activity with a playful design—from water absorption through a plant's roots to water vapor lost through its leaves.

To speak with someone at AAAS or *Science* about the contest, please contact *Science* press package staff at 202-326-6440 or scipak@aaas.org. To reach NSF, please contact Susan Mason at 703-292-7748 or smason@nsf.gov.

Addressing Ethical Standards
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are under intense pressure to publish, and a growing minority are seeking to bump up their CVs through dishonest means.

The extent of the problem is hard to assess. Defining plagiarism is not straightforward…and measuring the incidence of even the most clear-cut cases is difficult. Studies in certain fields have estimated that anything up to 20% of published papers contain some degree of self-plagiarism.…This may not be representative of basic research, but no rigorous, multidisciplinary study has ever been conducted.

And although most cases are never discovered, almost all of the editors and publishers contacted by *Nature* agreed that self-plagiarism is on the rise. "Editors are noticing many more cases," says Scott Dineen, director of editorial services at the Optical Society of America, which publishes ten journals. Last month, the increase prompted the society to issue an editorial statement on its commitment to expose plagiarism.

The advent of antiplagiarism software, such as that used by universities to check student essays, means that editors and publishers finally have a practical way to tackle the problem. Online services check essays against massive stores of documents generated from web trawls and purchases from media outlets. Supervisors can see which parts of the essays seem to be plagiarized and where the copied material comes from.

Subscribers can view the article in its entirety at http://www.nature.com/nature/journal/v435/n7040/index.html. Nonsubscribers will not have access to the article.

CALL FOR 2006 APPLICATIONS
ASPB Summer Undergraduate Research Fellowship

About the SURF Program

The goal of the ASPB Summer Undergraduate Research Fellowship (SURF) program is to provide opportunities for students to pursue meaningful research in plant biology at their home institutions early in their college years. Ideally, students should be **sophomores** at the time of application and would conduct their research the following summer. Exceptionally well-prepared first-year students and juniors who provide evidence of a strong commitment to plant biology will also be considered. In addition to conducting the research, recipients will be expected to present their results at the ASPB national meeting the following summer, July 7–11, 2007, in Chicago. Funding is available to attend the meeting through a special SURF Travel Grant (although this may not cover all expenses). ASPB hopes that the opportunity to pursue research during the summer and then present findings at a national meeting will encourage students to pursue advanced degrees and careers in plant biology.

Funding

Each fellowship provides the following:

- $3,000 student stipend
- $500 for supplies
- free student membership in ASPB (April 2006 to August 2007)
- a travel allowance to attend the ASPB national meeting. Up to a $500 travel grant has been set aside for each recipient to offset travel expenses. The student must be a coauthor on an abstract to qualify for the travel grant. Students from overseas or who have very limited access to other resources for travel may make a case for additional travel funds. The student must pay registration and other required meeting fees.

Eligibility

Open to students from both within and outside the United States.

Students must

- be enrolled as a full-time, degree-seeking student
- be involved in a research project in the laboratory of a faculty mentor who is a member of ASPB
- not receive other direct financial support for their research (institutional stipend, Sigma Xi Grants-in-Aid of Research, Council on Undergraduate Research Fellowship, etc.).

Mentors must

- be a member of ASPB
- have an ongoing research program.

Selection Criteria

*Competitive **student applicants** should demonstrate*

- strong motivation for research
- career objectives relevant to the aims of the fellowship program
- academic achievement
- preparation for conducting the research.

*The **faculty member** sponsoring the project should demonstrate*

- a commitment to undergraduate education and research
- a research program that is of high scientific merit—the project should clearly support the goals of the research program
- the appropriateness of the project for undergraduate research
- the existence of facilities to support the proposed work
- support from the administration (department chair or dean) for the project.

Preference is given to proposals that demonstrate the mentor's and the institution's financial commitment to the work and to proposals that show a significant impact on the mentor's ongoing research program.

Proposal Evaluation

ASPB is interested in supporting undergraduates at all types of institutions. To facilitate this goal, the proposals are grouped according to the applicant's institution type within the Carnegie classification scheme as follows:

GROUP A	GROUP B
Research Universities I	Master's Universities and Colleges I
Research Universities II	Master's Universities and Colleges II
Doctoral Universities I	Baccalaureate Colleges I
Doctoral Universities II	Baccalaureate Colleges II
	Associate of Arts Colleges

The number of proposals awarded funding in each group will be weighted according to the number of proposals received.

To Apply

The application must be submitted online. The form can be downloaded through the ASPB website at www.aspb.org. Look on the **ASPB homepage** for the link to the **2006 SURF Application** or click on EDUCATION or AWARD for a link.

Deadline: **Thursday, February 2, 2006**

- Postmark date for mailed transcript(s). Note: Transcripts may be sent electronically instead (see below).
- Midnight upload to ASPB designated website at **http://www.aspb.org/education/summerundergrad.cfm.**

Application and Attached Files of

- letter of recommendation
- transcripts (that can be sent electronically)
- supporting documents.

We are very pleased to report that with the success of the SURF Program, the ASPB Executive Committee has increased the number of awards from 10 to 15 for SURF 2006. Recipients of SURF awards are notified by e-mail, and contracts are sent by mail. Announcements are posted on the ASPB website. The 2006 recipients are expected to be announced by the end of April 2006.

Questions

Contact info@aspb.org

The Bioethics Imperative XXII

The Investigative Process and Outcomes of Those Investigations

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

Last time, we diagrammed the flow of an allegation through the NSF OIG: In 2003, NSF processed over 40,000 grant proposals. However, only about 400 allegations of potential wrongdoing were brought to the NSF OIG. Of those allegations, over 230 were determined to be nonsubstantive upon initial review, 79 were substantive enough for detailed review by Civil/Criminal Investigations Section, and 83 were substantive enough for detailed review by the Administrative Investigations Section. (See Figure 1 in the July/August 2005 issue of the *ASPB News,* pages 10–11).

Learning how to recognize a potential ethical breach seems to me an important part of functioning well as a scientist because this ability will help you avoid possible unethical acts on your own part, guard against false accusations made against you and others, teach you how to train your students properly, and flag potential ethics breaches that we all come across in the course of doing science (in grant proposals, presentations, and the literature). Although the last may seem distasteful "policing," we cannot afford to let this issue remain mokita because the consequences of *not* policing ourselves, our students, and our discipline are dire indeed. Remember what happened to David Baltimore and how the credibility of *all* scientists subsequently eroded? Our funding depends on the perceived credibility of science and scientists on Capitol Hill and, in turn, by the general public. Although ethics is not the only issue playing a role in the current erosion in national funding agencies, we need to be sure that it does not fuel the fire. How then can principal investigators learn to recognize what is ethical and what is not?

Interestingly, NSF routinely trains program officers about NSF operations through a Program Manager Seminar that all new program officers must attend. A section of that seminar is dedicated to ethical issues. A member of the OIG staff always attends this seminar to assist in facilitating these and other discussions. During the ethics review, employees discuss a wide range of topics including research misconduct and conflicts of interest by reviewing pertinent case studies, some of which are based on past events at NSF. Not all the case studies are legal or ethical violations, but they still prompt the attendees to think about the potential ethical issues associated with being a program officer and managing federal dollars. Ultimately, trainees are urged to report any suspected legal or ethical violations to the OIG. OIG has the expertise to deal with these matters, thereby freeing the program officer to concentrate on the scientific funding issues.

I made up four cases and asked the OIG to indicate whether or not these cases would warrant further investigation if they were true. The responses of James Kroll, head of Administrative Investigations of the OIG at NSF, are in italics.

Case 1: The text from an article in the literature is reused by the author of the original text—i.e., the author is recycling his own text verbatim. A student of the author realizes this and wonders what to do. Is this plagiarism? What should the student do? *Generally speaking, "self-plagiarism," as it is sometimes called, is not a good scientific practice. However, OIG generally does not pursue matters where small portions of text are reused by the original author.*

Case 2: In a grant proposal, a PI presents an idea that his postdoctoral fellow had without crediting the postdoc. The proposal is reviewed by the postdoc's former mentor, who knows about this idea from conversations with his former student. Did the postdoc's new PI steal the idea? *This matter would certainly require an initial inquiry. However, intellectual theft is a difficult matter to prove. It is not unreasonable to believe that two competent scientists could come up with similar ideas. To prove intellectual theft, there would have to be hard evidence that the postdoc shared the idea with the PI just before the PI wrote his/her proposal.*

Case 3: A researcher, Q, presents his data at a small local meeting at University of the Sky. Colleague M was at this meeting and spent quite a long time in front of Q's poster and actually photographed the poster. In working up his data for publication, Q finds that colleague M has published data virtually identical to Q's as a "Breaking Research" article. Q believes that M took an idea and, on the basis of Q's data presented at that meeting, rushed back to his lab to repeat the work and then published before Q. What recourse does Q have? *This case appears to be a solid case of intellectual theft. Investigation would have to verify that Q and M were at the same meeting, and Q would have to show proof of his presentation. M would then be asked to demonstrate that his research predated Q's research. The key in this case would be the identical nature of the data. Q would want to contact the OIG of the cognizant funding agency as well as his own VP for Research regarding this matter.*

Case 4: On a manuscript, the senior author lists the name of a competitor as an author so that that competitor does not receive the manuscript for review. The manuscript is reviewed favorably. The senior author strikes the name of the competitor from the proofs and boasts of his cleverness to a junior colleague. What should this junior colleague do? *I can't say that we have ever seen a case like this. I am not sure that this is a violation of any Federal rule. One could argue falsification, since the author falsely lists the competitor as his coauthor. At the same time, this is clearly unethical behavior. If the senior author did not want his competitor to review the proposal, he should clearly state that to the journal editor with his justification for that request. I would think that most editors would respect a "reasonable" request of that nature. As for the junior colleague, he should consider contacting the OIG of the cognizant agency, the editor, and the VP for Research regarding the matter.* [Note: Both *Plant Physiology* and *The Plant Cell* notify all authors on a submitted manuscript that they have been listed as an author.]

Next time: An In-Depth Look at Effort Certifications: The Good, The Bad, & the Ugly

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Gallie Discusses Research Leading to High-Protein Corn at Congressional Seminar

Cereal grains are the most important crops to humanity, and corn is one of the most valuable crops to U.S. agriculture, ASPB member **Dan Gallie** explained during a congressional seminar September 23 at the Longworth House Office Building.

"Protein malnutrition is a leading cause of death in children in developing countries, many of which already produce corn as a major cereal crop," Gallie noted. The images we see on television of children with distended bellies in poor nations reflect protein deficiencies in their diet. Most people in developing countries obtain their protein from fruits, vegetables, and grains, Gallie added.

Dan Gallie

Dan Gallie explains how protein-packed corn can benefit the hungry in developing nations. Seated from left are Maryanna Henkart of NSF, ASPB Public Affairs director Brian Hyps, and Gail McLean, USDA–CSREES–NRI.

Traditional breeding approaches used in the past to make possible the increases in grain productivity that exist today are unlikely to provide the additional increases needed for the future, Gallie noted, adding that population growth is projected to outstrip world food production by mid-century.

With support from the USDA National Research Initiative and National Science Foundation, Gallie has conducted basic research on corn that has led to new technology that doubles the protein content of corn grain. This finding benefits farmers in both domestic and world grain markets.

In his talk, "Powering an Enhanced Green Revolution with Protein-Packed Corn: Thinking Outside the Kernel," Gallie explained the steps he took in his research and the lifesaving benefits these findings can have for hungry people throughout the world.

Protein-energy malnutrition (PEM) affects every fourth child worldwide. A total of 150 million are underweight, and 182 million have stunted growth. Seventy percent of PEM children live in Asia, 26 percent in Africa, and 4 percent in Latin America and the Carib-bean, according to the World Health Organization. Corn is grown or can be grown in a number of the areas where PEM is found.

Gallie succeeded in doubling the protein content of corn by engineering double-embryo corn. This basic research finding makes possible further research that could lead to commercial development.

Gallie expressed appreciation to Congress, NSF, and USDA–NRI for making his research possible. Participating in the seminar program with Gallie were representatives from the agencies that supported his research: **Maryanna Henkart,** division director for the Division of Molecular and Cellular Biosciences at NSF, and **Gail McLean,** national program leader for NRI Agricultural Plants and Environmental Adaptation and for NRI Agricultural Plant Biochemistry.

Henkart, McLean, and Gallie all emphasized the importance of congressional support for basic research to lead to breakthroughs such as this discovery with maize. The seminar was sponsored by the National Coalition for Food & Agricultural Research (National C-FAR). ASPB, a member of National C-FAR, had reported on Gallie's research findings to the coalition and was a contributing sponsor of the workshop. ASPB Public Affairs director **Brian Hyps** served as moderator for the session.The July summit of G8 nations in Scotland cited the need for increased assistance to developing nations in Africa. Gallie's research findings are an example of the profound benefits plant research sponsored by NSF and the NRI could have for hungry people in Africa and throughout the world.

At the same time, these research findings could lead to protein-enhanced feed for livestock in the United States and other nations. Nearly 6 billion bushels of the 9 billion bushels of corn produced in the United States annually are used for animal feed.

The modified corn also has half the carbohydrates of other corn. This has generated interest from some firms for use as a dietary food product for followers of low-carbohydrate diets in developed nations.

Gantt Meets with Congressional Offices to Support NSF, Plant Science

ASPB participated in a Congressional Visits day September 14 in support of the National Science Foundation as the Senate was voting on fiscal year 2006 appropriations for NSF.

ASPB past president **Elisabeth Gantt** of the University of Maryland and ASPB Public Affairs staff conducted visits with congressional offices together with several other scientists from different disciplines.

Maryland representative meetings were with **Representative Chris Van Hollen, Jr. (D-MD),** who is Gantt's representative from the 8th District, and with the staff of **Congressman Steny Hoyer (D-MD),** whose district includes the University of Maryland.

Gantt and ASPB staff also participated in meetings with three Minnesota offices: those of **Senator Mark Dayton (D-MN), Senator Norm Coleman (R-MN),** and **Representative Martin Sabo (D-MN).** They were accompanied by the lone Minnesota-based scientist in the group, **Steve Ruggles,** University of Minnesota.

Chris Van Hollen, Jr.

In leading the discussion with Van Hollen and his staff, Gantt pointed out the need to boost the budget for NSF, which experienced a slight reduction in funding last year. Van Hollen discussed the importance of support for cutting-edge research supported by NSF. He and his staff expressed interest in an example offered by ASPB of plant research that has increased understanding of RNA interference. Research on RNAi in plants has led to similar findings in mammals. RNAi research findings could lead to new approaches in plant science and medicine that could silence disease genes in plants, animals, and humans.

ASPB staff thanked Van Hollen and his staff member **Ken Cummings** for their timely and effective work during the past year in contacting the National Institutes of Health related to ASPB's concerns with maintaining copyright protection of science journal articles. Van Hollen is a member of the Judiciary Committee, which has jurisdiction over copyright laws. He is also a member of the Committee on Education and the Workforce and the Committee on Government Reform.

Hoyer's staff noted that the Congressman is a strong supporter of NSF and encouraged scientists to seek a better balance in the federal budget by seeking reduced priorities for tax cuts so that there could be increased domestic spending on research. Hoyer is a senior member of the House Appropriations Committee and a leader of the Democrats as Minority Whip. He is in his 13th term.

A senior member of the Appropriations Committee, Sabo told ASPB representatives and other visitors that more funds will be needed in the budget to be able to increase funding for NSF. Sabo is in his 14th term.

ASPB representatives encouraged those Senate offices visited to vote against a proposed amendment that would have diverted funding from NSF to go to disaster payments. Staff in Dayton's and Coleman's offices did not express any support for the amendment. A staff member correctly predicted that the amendment would not pass.

Several years ago, NSF did experience a reduction in funding under a House amendment. Increased science community support for NSF has helped weaken support for failed amendments in both the House and Senate this year that would have taken funding away from NSF.

On September 13, Gantt and ASPB staff joined with representatives from other science societies to participate in a luncheon with officials from NSF. **Machi Dilworth** represented **Mary Clutter** for the Directorate of Biological Sciences and provided an overview of programs supported by BIO. The luncheon program was coordinated by the Coalition for Agricultural Research Missions (CoFARM) and Biological and Ecological Sciences Coalition (BESC). ASPB is a member of both.

On the morning of September 14, Gantt and ASPB staff also joined with other scientists from CoFARM member organizations for a breakfast meeting with **Dr. Colien Hefferan,** administrator of the USDA Cooperative State Research Education and Extension Service. ASPB representatives thanked Dr. Hefferan for her leadership in support of USDA–CSREES research programs.

ASPB will be coordinating a USDA–CSREES research priorities stakeholders' workshop on plant and pest biology November 16, 2005, at which Hefferan will participate. Hefferan said that the report that will be developed from the stakeholders' workshop will provide key scientific direction for future CSREES program development. USDA–CSREES is providing grant support for the workshop.

NSF Plant Genome Research Program Awards 19 New Projects to 36 Institutions

Focus Includes Hybrid Vigor, Seed Production, and Trees

The National Science Foundation (NSF) has made 19 new awards totaling $58.7 million in 2005, the eighth year of its Plant Genome Research Program (PGRP). The two- to five-year awards, ranging from $622,000 to $7.7 million, fund research and tools to reveal information in the genomes of economically important crop plants such as wheat and soybeans as well as increase understanding of the genetic control of plant processes, including disease resistance, flavor development, seed growth, and wood formation.

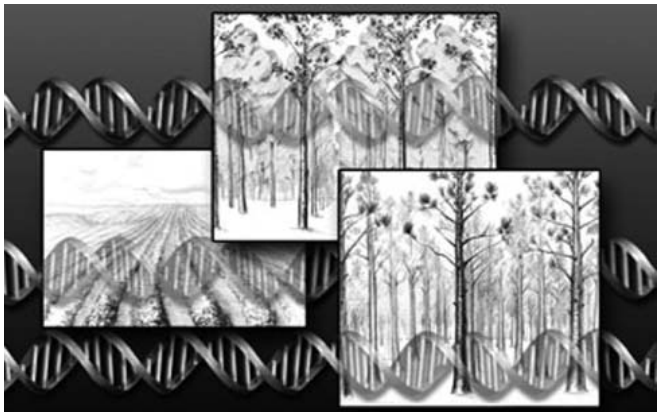
"PGRP-funded research is helping to unearth secrets rooted in plant genomes," said **Mary Clutter,** the former head of NSF's Biological Sciences Directorate who recently retired after a distinguished career. "In addition to enabling discoveries in basic plant biology, these latest projects will expose a host of new students to cutting-edge plant genome research. Well-trained students are critical to the future of plant biology," Clutter continued.

The new awards, made to 36 U.S. institutions in 24 states, include three international collaborative projects. First-time PGRP award recipients include California Polytechnic State University–San Luis Obispo, Claflin University, Michigan Technological University, University of Puget Sound, University of South Carolina, and University of Wyoming.

The genomes of economically important plants are often large and complex, but through in-depth studies scientists will uncover information that can be translated into new and improved products and practices. Plant genome research holds enormous promise for improving plants of all sizes, from small crop plants to towering trees, NSF noted.

Examples of research projects targeting major crop plants that will receive NSF funding include the following:

- A project led by the University of Washington in Seattle investigates the poorly understood yet widely accepted phenomenon of "hybrid vigor," whereby offspring turn out bigger and hardier than their parents.
- Researchers at the University of Illinois Urbana–Champaign explore nitrogen responses in maize to elucidate the genetic basis for dramatically increased yields following fertilization. This project includes an NSF-supported Developing Country Collaboration with the International Institute for Tropical Agriculture in Nigeria.
- A University of California, Los Angeles–led project focuses on the soybean to identify all of the genes and regulatory networks required to make a seed. Knowledge gained from studying soybean seed, an important source of human and animal nutrition and a raw material for industrial applications, will likely be applicable to seeds from all plants.
- Another subset of awards centers on understanding the genetics of trees. Trees are naturally important to produce oxygen, provide shade, and fight soil erosion and to supply more than 5,000 items in our daily lives—from fuels and paper to fruit and medicines. Studying trees has challenged researchers, in part because of the plants' large sizes and long life cycles. Three projects are developing and using genomic tools to better understand tree metabolism and development.
- Researchers at the University of California, Davis study genetic variation associated with wood quality and disease resistance in loblolly pine, potentially developing new resources for tree breeding.
- Michigan Technological University investigates the metabolic pathways leading to synthesis of salicylates, aspirin-related plant compounds that confer disease resistance in poplar trees.
- Mississippi State University researchers examine the regulation of genes associated with the flowering process in poplar trees.



Plant Genome Research Program awards will support genomics research in major crop plants such as soybean and in trees like the loblolly pine and poplar. Photo credit: Nicolle Rager Fuller, National Science Foundation.

The PGRP, established in 1998 as part of the coordinated National Plant Genome Initiative by the Interagency Working Group on Plant Genomes of the National Science and Technology Council, has a long-term goal of advancing the understanding of the structure and function of genomes of plants with economic importance.

This information was provided in a news release issued by NSF October 6. A complete list of the 2005 PGRP awards and project abstracts can be accessed at http://www.nsf.gov/bio/pubs/awards/pgr.htm.

Senator Bond Offers Tribute to Mary Clutter

"Personifies the Model Public Servant"

The Senate champion of plant genome research, **Christopher (Kit) Bond (R-MO),** offered a spirited tribute to **Mary Clutter** in the *Congressional Record* July 29 (pages S9457–S9458) that looked back on her distinguished career.

Clutter retired in September from the National Science Foundation as assistant director heading up the Directorate for Biological Sciences. She had expressed a desire to embark on her well-earned retirement several years ago but was dissuaded by her then-boss **Rita Colwell,** former director of the National Science Foundation.

There were also times when she wondered if she should have assured Colwell's successor, NSF director **Arden Bement,** that she would stay on until her own successor was found. She had second thoughts on that assurance because the search for her replacement continued for an extended time. Like Colwell, **Neal Lane,** and those before them, Bement appreciated the valuable contributions Clutter made to NSF and the science community. Who could blame them for convincing her to stay on duty months and years longer?

A surprise party was held for Clutter in her office on September 8. A framed copy of Senator Bond's tribute to her was presented at the party (see photo with this story). NSF deputy director **Kathie Olsen, Cliff Gabriel** of the Environmental Protection Agency, **Ed Kaleikau** of USDA–NRI, colleagues from the BIO Directorate, ASPB members and staff, and many more attended. Clutter's usual attempts to shun the limelight were successfully trumped by the attending crowd and secret conspiring party planners.

A thoughtful collection of photos, letters, and other items chronicling her distinguished career was presented by **Sonya Mallinof, Joann Roskoski, Machi Dilworth,** and their BIO Directorate colleagues. As one of the letters noted, "Mary may be retiring as AD, but the outstanding character that defines her is a role she'll never be able to leave."

Mary Clutter displays Senator Kit Bond's *Congressional Record* tribute to her during her retirement surprise party on September 8. Joining in the recognition of Mary's contributions to NSF are Kathie Olsen (left), Joanne Roskoski (far right) and Sonya Mallinof (next to Joanne).

Following is the special tribute, from Senator Bond:

Tribute to Dr. Mary Clutter, NSF

Mr. President, I rise to honor Dr. Mary E. Clutter who will be retiring in August from the National Science Foundation, NSF. To say that Dr. Clutter has had a distinguished career at the NSF would be an understatement due to her countless achievements in the area of biological science. Today's biological science has not only been assisted by Dr. Clutter but in many respects, it has been defined by Dr. Clutter, and her leadership in this important scientific area.

Dr. Clutter personifies the model public servant with a career at the NSF that spanned almost three decades. Dr. Clutter began her career as a temporary program officer at the NSF. Over the ensuing years, she has served with distinction in many important leadership roles at NSF: as the division director of Cellular Biosciences, Senior Science Advisor to the NSF Director, acting deputy director, and assistant director for the Directorate for Biological Sciences. She has served four Presidential administrations beginning with President Ronald Reagan to our current President George W. Bush. As a member of the Senior Executive Service, Dr. Clutter has received numerous awards, including the Meritorious and Distinguished Executive Presidential Rank Awards from Presidents Ronald Reagan, George H. W. Bush, and William Clinton.

During her career, Dr. Clutter has worked to develop a long-term and forward-thinking strategic vision for the biological sciences within NSF covering plant biology, environmental biology, computational biology, biodiversity research, long-term ecological research, and

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Future ASPB Annual Meeting Sites

2006: Boston, Massachusetts
August 5–9
Hynes Convention Center

ASPB will hold its 2006 annual meeting in conjunction with the Canadian Society of Plant Physiologists, la Société Canadienne de Physiologie Végétale. Mark your calendars and look for more information soon.

2007: Chicago, Illinois
July 7–11
Hilton Chicago

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

Plant Biology 2008
to be determined

Plant Biology 2009
Honolulu, Hawaii
July 18–22

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

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nonmedical microbiology. Further, these areas of research have influenced other scientific research areas and will continue to influence the biological sciences for years to come.

In my opinion, Dr. Clutter's most important achievement has come in the area of plant genome research. It is without question that what we now know and will know about plant genome research would not have occurred without Dr. Clutter's vision, leadership, and hard work. In 1997, I asked the Office of Science and Technology Policy, OSTP, to create an interagency working group to develop a new national plant genome initiative. OSTP wisely appointed Dr. Clutter to cochair the working group and, under her leadership, a plan for the national plant genome program was born in June 1997. Under the new National Plant Genome Initiative, Dr. Clutter brought together key Government research personnel from NSF, the Department of Agriculture, the National Institutes of Health, and others to develop and implement the plant genome program.

The plant genome research program at NSF has grown from an initial $40 million in fiscal year 1999 to $95 million today and Dr. Clutter has ensured that every penny has been spent wisely and, with this investment, the United States is the world leader in plant genome research. The plant genome program has already yielded tremendous results that will eventually contribute to better agricultural products that will improve human health and nutrition. For example, Dr. Clutter's leadership has contributed to the completion of the Multinational Arabidopsis Sequencing Project. This project was completed three years ahead of schedule and produced the first complete sequence of a higher organism. This work has further contributed to the sequencing work of other plants such as maize, soybeans, and other economically significant crops.

With this research, scientists are now beginning to understand the basic mechanisms underlying important plant traits such as cold tolerance, disease resistance, and seed development. Dr. Clutter's leadership has created a new scientific foundation on plant biotechnology that will eventually yield major breakthroughs in our understanding of plants, which will eventually lead to the development of new advances in agriculture, energy, and the environment. I strongly believe that the impressive research being done with plant genomics, led by Dr. Clutter, can eventually be a very powerful tool for addressing hunger in many developing countries such as those in Africa and Southeast Asia.

While Dr. Clutter's contributions to plant biology and genomics are extremely distinguished and too numerous to list in this tribute, I do want to emphasize the role she has played in broadening the participation of women and minorities in the fields of science. Countless number of today's scientists and our future scientists have been positively influenced by Dr. Clutter. She has promoted and emphasized international research collaboration between U.S. and foreign scientists and provided opportunities for international research experiences for young scientists.

As the former chairman of the VA-HUD and Independent Agencies Appropriations Subcommittee, my staff and I have found Dr. Clutter to be an invaluable resource and ally in advancing plant genome research. I especially enjoyed her professionalism and passion for science, which never waned or wavered during the years I worked with her.

Finally, on a personal level, in addition to being a leading intellect, she is warm, engaging, enthusiastic, and has a high tolerance for the less knowledgeable. Dr. Clutter's new liberties are well deserved but her departure will be a major loss to the NSF and the Federal Government. She will clearly be missed by the science community, and I will definitely miss her in this capacity, both as a friend and a public servant. I wish Mary and her family all the best.

USDA National Research Initiative national program leaders ***Gail McLean*** *and* ***Liang-Shiou Lin*** *wrote the following article summarizing funding of leading plant research by the NRI. We appreciate their contribution to the* ASPB News.

Support of Agricultural Plant Science by NRI

The support of research, education, and extension activities in agricultural science is essential for the sustainability and improvement of U.S. agriculture. In this article, we provide information on the support of agricultural plant science through the USDA Cooperative State Research, Education and Extension Service (CSREES) National Research Initiative (NRI) competitive grants program. CSREES advances knowledge for agriculture and related areas through the extramural funding of research, education, and extension programs. The NRI is CSREES's largest competitive grants program. Since its inception in 1991, it has supported basic and mission-linked research projects in the biological, physical, and social sciences that relate to agriculture, including food, the environment, and communities. Since 2003, the NRI has also supported integrated projects that combine research, education, and extension activities.

In fiscal years 2002 to 2004, the NRI awarded $124.5 million for plant science research related to agriculture. The funding was provided through a number of NRI programs, including Developmental Processes of Agricultural Plants, Agricultural Plants & Environmental Adaptation, Agricultural Plant Biochemistry, Managed Ecosystems, Genetics Processes and Mechanisms of Agricultural Plants, Improving Food Quality and Value, Biology of Plant-Microbe Associations, Biology of Weedy and Invasive Plants, Plant Genome, and Plant Biosecurity. The goal of these programs is to support a portfolio of plant research that will provide the knowledge, tools, approaches, and applications needed to sustain and improve U.S. agriculture.

Projects supported by the NRI plant programs address current problems and develop fundamental knowledge essential for sustainability of plant production systems and protection of the environment. Of the almost 700 plant research proposals funded from 2002 to 2004, virtually all were hypothesis-driven, basic research studies. Approximately 47 percent of the awards also had an applied research component. In the past, some projects funded through the NRI plant research programs utilized model or reference organisms that were not of evident agricultural significance. Such projects provided fundamental scientific knowledge that will be used to solve agricultural problems. As progress has been made in fundamental knowledge using reference organisms, the NRI plant programs currently strongly encourage scientists to transfer knowledge from model systems and to base investigations in agricultural plants or organisms of economic importance. Depending on the program, proposals must either use a species of agricultural importance directly as part of the experimental methods or include plans for transferring the findings from the model reference species to an agricultural species.

NRI proposals undergo competitive peer review, with the primary review criteria being scientific merit and agricultural relevance. Proposals are reviewed by panel members and, in many cases, also by ad hoc reviewers. The review panel consists of scientists and other stakeholders who are eligible to apply to the NRI program but who have not applied during that review cycle. Panelists are selected because they possess the expertise needed to review critically the scientific merit and agricultural relevance of the proposed research. In addition, panel members represent all regions of the United States, diversity in regard to minority status and gender, different types of institutions (land grant, public non–land grant, private, industry, and government), and different levels of academic rank. A portion of the previous year's panel members serve on the upcoming panel to ensure continuity. Typically, most of the panelists (65 percent for the 2002–2004 plant programs) are from land grant universities.

A notable aspect of the NRI is the applicant eligibility. The NRI has the broadest eligibility of all the CSREES competitive grants programs. Eligibility for NRI funding of research projects is open to scientists from a wide variety of public, private, and non-profit organizations and as individuals. This broad eligibility encourages a range of approaches and disciplines and, importantly, increases the number of scientists actively involved in agricultural research.

Of the $124.5 million awarded for plant research, land grant universities and colleges received $92.8 million or 74.6 percent while submitting 70.6 percent of the proposals. Non–land grant public universities received $14.1 million or 11.3 percent of the funding. Of the remaining funds, USDA agencies such as the Agricultural Research Service received 5.85 percent, private universities 5.02 percent, private non-profit organizations 3.08 percent, and private for-profit organizations 0.16 percent of the total funding. Of the proposals submitted from land grant universities, 80.6 percent were from agricultural departments, which in turn received 76.6 percent of the funding awarded to land grant institutions and 57.1 percent of the total overall funding for plant sciences. As these numbers indicate, both land grant universities and their agricultural departments compete quite successfully for NRI funding.

The NRI uses many approaches for setting program priorities and obtaining stakeholder input. Approaches include attendance by NRI National Program Leaders (NPLs) at scientific and professional meetings, organization of stakeholder workshops and listening sessions, and information-gathering activities with scientific and professional societies. The NPLs regularly participate in symposia and organized sessions to solicit input as well as to provide information to stakeholders. Another impor-

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tant avenue for obtaining external input is communication with the panel manager, panel members, individual researchers, trade organizations, and other federal agencies. The awardee meeting now required of every NRI program presents a new opportunity for collecting input on program priorities. Information on upcoming and previous CSREES-sponsored workshops is available on the CSREES website (http://www.csrees.usda.gov). The NPLs directing the NRI programs of interest, the Competitive Programs (CP) deputy administrator, the CP science advisor, and the CP education advisor can also be contacted regarding stakeholder input and priority setting for the NRI and other CSREES competitive programs.

CSREES as a whole has a broad portfolio of funding opportunities including formula funds, special grants, and competitive grant programs that support plant science research. Through its historic partnership with the land grant institutions, CSREES advances knowledge to support agriculture by building a research, education, and extension continuum that links scientific research to local agricultural applications. The NRI serves an important role by supporting high-quality research and integrated projects on important agricultural problems and by attracting new scientists to agricultural research. Knowledge gained from NRI-supported projects will help meet the challenges facing the nation's food, feed, fiber, and natural resources systems now and in the future.

Gail McLean
Liang-Shiou Lin
National Program Leaders
Competitive Programs Unit
USDA CSREES
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Federal Grantsmanship Workshop Offers Insights to Grant Applicants

Approximately 85 people attended the Federal Grantsmanship program at the ASPB annual meeting held this past July in Seattle. Those attending heard insights on preparing grant applications from national program officers from the National Science Foundation and USDA National Research Initiative (NRI).

Parag Chitnis of the NSF Molecular and Cellular Biosciences Division, Biomolecular Systems Molecular Biochemistry Program, shared with attendees a list of guidelines to follow in writing a research grant application. His colleague, **Nancy Pruitt,** program director in the Division of Undergraduate Education, provided information on education grants.

Gail McLean, national program leader for NRI Agricultural Plants and Environmental Adaptation and for NRI Agricultural Plant Biochemistry was joined by **Liang-Shiou Lin,** national program leader for NRI Genetic Processes and Mechanisms of Agricultural Plants and for Developmental Processes of Agricultural Plants. They shared experiences they've had with reading grant applications and offered advice on avoiding errors in grant writing.

Materials on National Institutes of Health research support for plant science were distributed by ASPB member Sabeeha Merchant, a professor and NIH grantee at the University of California, Los Angeles.

Contributions in planning for the workshop were also made by **Machi Dilworth,** NSF director of the Biological Infrastructure Division, and **Ed Kaleikau,** national program leader for the NRI program on Functional Genomics of Agriculturally Important Organisms and for Applied Plant Genomics–Coordinated Agricultural Project. Agency officials also staffed the federal agencies booth in the exhibit hall and interacted with attendees throughout the convention.

This was the second consecutive year of the federal grantsmanship program and both were well attended. Interest was expressed in again having a federal grantsmanship program at the ASPB annual meeting next August in Boston.

Important Dates in 2006

February 24
Mid-Atlantic Section Meeting
University of Maryland, College Park

February 25
Executive Committee Meeting
ASPB headquarters, Rockville, Maryland

February 25–27
Southern Section Annual Meeting
Daytona Beach, Florida

February 28
Abstracts (minisymposia) deadline for
Plant Biology 2006

April 3
Abstracts (posters only) deadline for
Plant Biology 2006

April 14
Early registration cutoff for
Plant Biology 2006

June15
Pre-registration cutoff for
Plant Biology 2006

July 1
Housing cutoff for
Plant Biology 2006

August 4–8
Executive Committee Meeting
Boston, Massachusetts

August 5–9
Plant Biology 2006
Boston, Massachusetts

September
(date to be determined)
Mid-Atlantic Section Crab Feast
ASPB headquarters, Rockville, Maryland

Luan Identifies Rice Gene Variant Associated with Salt Tolerance

University of California at Berkeley scientist **Sheng Luan** and colleagues, in collaboration with **Hong-Xuan Lin** of the Shanghai Institute for Biological Sciences, have identified and characterized a gene variant in rice that is associated with salt tolerance, as reported in the October issue of *Nature Genetics.*

Sheng Luan

Soil salinity is one of the key factors limiting crop productivity worldwide. A better understanding of the genetic basis of salt tolerance in natural varieties of crops may lead to new approaches to engineer them to withstand high levels of salt in the environment.

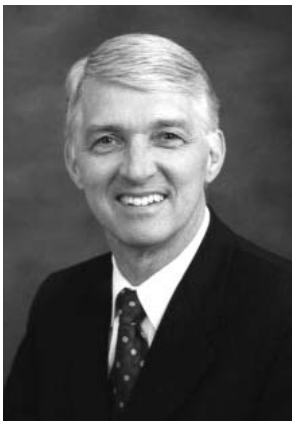
ASPB member Luan and his colleagues showed that salt tolerance in a particular variety of rice—Nona Bokra—is caused in part by variation in the gene SKC1. SKC1 encodes a sodium transporter whose role seems to be to recirculate sodium ions from shoots to roots, thereby promoting the elimination of the sodium by other transporters in the roots.

The Nona Bokra version of SKC1 is more active than the one found in the salt-sensitive variety, Koshihikari, and the difference can be traced to four amino acid changes between the two versions of the protein.

Nature issued a news release on the research, upon which this story is based. The research article was also accompanied by a "News and Views" commentary in *Nature Genetics.*

Governor Blunt Appoints ASPB Member Beachy Plant Biotechnology Council Chairman

JEFFERSON CITY—Missouri **Governor Matt Blunt** announced the appointment of ASPB member **Roger Beachy** as chairman of the Governor's Advisory Council on Plant Biotechnology.



Roger Beachy

Beachy is the founding president of the Donald Danforth Plant Science Center in St. Louis. He received a bachelor's degree in biology from Goshen College in Indiana and a doctorate in plant pathology from Michigan State University. He is a member of the National Academy of Sciences and is internationally known for his research on developing virus-resistant plants through biotechnology.

The Governor's Advisory Council on Plant Biotechnology is charged with analyzing Missouri's current life sciences environment to determine how the state can better capitalize on the industry's potential, serving as an aggressive recruitment committee to attract new life sciences companies to Missouri and determining if a state-based regulatory structure is desirable.

Celebrity Salesmanship

From Organic Cigarettes to Enzyme-Rich Raw Foods

Commentary by ASPB member Alan McHughen

Beware of celebrity experts. Fading celebrities selling shoes is one thing, but health and nutrition should be left to real experts.

Years ago, aging actors found that they could extend their celebrity lifespan through commercial endorsements, promoting everything from shampoo to cars. Then sports heroes, recognizing that fame was as fleeting as their athletic skills, endorsed commercial products while their stars were still high. More recently, political campaigns have bolstered their publicity by trumpeting celebrity sponsors. In the last presidential campaign, both major parties boasted the support of people who were famous not for their political intellectual talents, but because they were, well, famous.

But this is no more a problem than having tired soap opera stars selling detergent. And sport stars tend to sell sports equipment. In a healthy democracy, everyone is entitled to support whichever politician or party they chose, and just because a person enjoys celebrity doesn't remove that inalienable right. More worrisome is the voter who actually votes for a candidate simply because someone they admire, often equally ignorant of politics, endorses them. But even this is unlikely to rattle the foundations of democracy or cause other real harm.

Truly harmful are the celebrities expounding on issues of health and science when they clearly have no real expertise in the subject matter. Actress **Julie Delpy,** in discussing her "healthy" lifestyle, explained to *Organic Style* magazine, "I eat organic food and drink only green tea—gallons of it when I'm writing. I smoke cigarettes, but organic ones."

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Those wishing to acquire Julie's pretty form, or even those tacitly accepting Julie's spurious nutritional expertise, may decide to follow her example and drink gallons of green tea and take up smoking. If they're organic cigarettes, then of course they must be good for you. Or so the thinking goes. What celebrity superstar will it take to point out that no cigarettes, even organic ones, can in any way be considered healthy?

And then we have former model **Carol Alt** and her recent book *Eating in the Raw* (Clarkson Potter publishers). Not content to grace the cover of *Sports Illustrated's* swimsuit issue (twice) and star in dozens of forgettable TV shows and B movies, she's now flexing her brain in becoming a self-proclaimed nutrition expert, saving the world by promoting raw food and denigrating food preservation and cooking. After all, although everyone's heard of carbs, calories, proteins, and vitamins, few know much about the true workhorses of all living things—enzymes! And because preservation and cooking destroy enzymes, we're deprived of some of the most nutritious substances when we cook or otherwise preserve food. Well, nutrition experts do agree—enzymes are indeed the workhorses of the body, and most enzymes are quickly destroyed by cooking. But what Alt neglects to share with the public is that enzymes are also destroyed by stomach digestion, usually more quickly than by cooking. She also neglects to explain that cooking destroys the natural toxins and common pathogens present in or on many foods.

When a celebrity promotes a questionable—or even outright dangerous—product or practice, how do the doctors, nutritionists, scientists, and other legitimate experts correct the mistakes? They typically have no public voice and no name recognition.

So what? If nonexperts can sell us shaving cream, shoes, and politicians, why can they not sell lifestyles and nutrients? The difference is the true hazard. If I buy an inferior brand of soap or shoes, or vote for the wrong candidate, I suffer no real loss other than, perhaps, pride. But when I decide to smoke what I am led to believe are healthy, organic cigarettes, or eat raw cassava, lima beans, and meat, I am taking real health risks and can suffer real nasty consequences. So does anyone who follows such pop idols.

The thought of taking health and nutrition advice from celebrities causes me as much indigestion as the thought of a slightly flabby, middle-aged plant geneticist adorning the cover of *Sports Illustrated's* swimsuit issue.

Alan McHughen is a slightly flabby, middle-aged plant geneticist. He works at the University of California, Riverside. Email: alanmc@ucr.edu

CALL FOR APPLICATIONS

ASPB Travel Award Program for Plant Biology 2006 in Boston

Applications for travel awards to Plant Biology 2006 are now being accepted for consideration by ASPB. The application form appears on the facing page of this issue of the *ASPB News* and will be posted on the ASPB website at http://www.aspb.org.

The Society has allotted $35,000 to be given out in allotments of $500 for the continuation of the Travel Award Program. The goals of the program are to increase attendance of young scientists at the annual meeting by providing travel funds for those in financial need and to increase diversity among the annual meeting attendees. Undergraduate students are strongly encouraged to apply, as are graduate students, postdocs, and faculty beginning their careers in plant science.

It is required that applicants submit an abstract of research to be presented at the meeting; they will also be asked to write a paragraph on the form expressing why attending Plant Biology 2006 would enhance their career. Two letters of recommendation are required as well.

Selection criteria will be based first on the science and the quality of the abstract, second on the statement about how attending will have an impact on the applicant's career, third on the strength of the recommendations, and fourth on ethnic diversity. Applications must be received at ASPB headquarters by February 15, 2006. Those applicants selected to receive an award will be notified by March 15, and the money will be sent in advance of the meeting. The early-bird registration cutoff date is April 14, and housing reservations must be made no later than July 1, 2006.

Compiled and edited by Mary E. Williams, Harvey Mudd College, Biology Department, Claremont CA, 91711; mary_williams@hmc.edu

Broadening the Definition of Graduate Training

Before becoming "faculty," few scientists receive any meaningful training in teaching or pedagogy. After all, until we become faculty, our professional activities are primarily focused on research (other than a short stint as teaching assistants). And yet, most university faculty members are expected to engage in undergraduate teaching, with significant teaching loads expected for faculty at primarily undergraduate institutions.

In recent years, NSF has increasingly encouraged us to incorporate some sort of public education or outreach into our professional activities, but for most of us these endeavors are even more removed from our limited formal training as TAs.

Two ASPB members addressed these issues in their presentations at the ASPB annual meeting this past July in Seattle. **Danielle Sherdan** presented a poster on her experiences developing and implementing plant biology materials in classrooms as part of her graduate training in plant biology. She was supported by an NSF Graduate K–12 award designed to "increase the number of science professionals who are prepared to make meaningful contributions to science and mathematics activities in grades K–8." That is, the program is designed to help future faculty members develop a broader set of skills than they otherwise would, and so be in a better position to participate in future outreach activities. Sherdan pointed out that her "time away from research" was not a lot more than it would have been as a standard TA. Her description of her experience appears below.

Christine Fleet of Duke University gave a talk and poster on a study she conducted with **Paula Lemons** on what hiring institutions look for in their incoming faculty members. Their findings, described on page 24, support the need for graduate training to include more and better opportunities for teaching.

The experiences of these two ASPB members make a compelling argument and suggest a mechanism for universities to broaden graduate training in order to provide more teaching opportunities.

Experiences of a Graduate Student in K–8 Classrooms

Experiences in the NSF Graduate K–12 program have improved my communication, presentation, teaching, and learning skills and thus enhanced my graduate training. From discussions at national and regional GK–12 forums, I learned that the design of each program is unique but that all have common goals. The GK–12 program at Florida State University (FSU) has fellows from various scientific fields. It began with an invaluable course that included topics in development and psychology of learning, interactive teaching and learning, and experience using well-designed instructional material. Throughout the program we have discussed effective teaching strategies, challenges, and political issues regarding education. My most challenging and rewarding experiences have been in classrooms. Teachers and I work together to demonstrate and practice effective teaching strategies, such as pretesting and preconception identification, strategic questioning, activities, and assess-

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During an activity designed to teach the relationship between structure and function in flowers and fruits, Danielle Sherdan is explaining that each kernel of corn is a fruit and that an inflorescence of flowers (with long styles, the silks) produces an inflorescence of fruits. Photo credit: Colleen Hosford.

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ments. Teaching is the best way to learn, as I have discovered while teaching aspects of the history and nature of science, earth and space science, physics, chemistry, and biology. As a plant biologist, I strive to demonstrate to students and teachers the utility of plants for teaching scientific methods, ecology, cell biology, development, and genetics. My efforts to provide new ideas and resources for teachers promote interactions with and provide a pathway for outreach for faculty, staff, and graduate students in science departments. Bringing materials from professors into classrooms and inviting graduate students to discuss and demonstrate their scientific ideas and experiments have a positive impact on the students' concepts regarding scientists and science careers. The NSF GK–12 program has provided me with a toolbox that I will use to build and improve my skills in teaching and science communication throughout my career.

More about the program at FSU including program overview, experiences of fellows, and program assessment has been published by SERVE in *Science Graduate Students in K–8 Classrooms: Experiences and Reflections,* edited by P. J. Gilmer, D. E. Granger, and W. Butler. The FSU GK–12 program homepage is at http://gk12.bio.fsu.edu/, and more information about the GK–12 program at NSF can be found at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5472&org=NSF.

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Survey of Hiring Practices Indicates Need for Changes in Graduate Education

Our survey of biology faculty at a wide range of academic institutions points to important differences among different types of colleges and universities with respect to expectations for both teaching and research. In particular, we compared responses from faculty at doctoral institutions (which train Ph.D.s) to responses from those at non-doctoral institutions (including those granting master's, baccalaureate, and associate's degrees).

Respondents' comments suggest that for a job candidate interested in a non-doctoral institution, attending professional meetings (something most graduate students do), working with undergraduates (something some graduate students do), and designing and teaching one's own course (something few graduate students do) are all of equal or greater importance relative to publication. In terms of teaching experience, nearly two-thirds of respondents at non-doctoral institutions expected candidates to have prior experience teaching their own course, whereas most respondents at doctoral institutions expected candidates to have experience only as teaching assistants. Many respondents noted that the experience provided by most teaching assistantships does not replicate the responsibilities required of instructors teaching their own course and that TA-ships are simply inadequate preparation for teaching one's own class.

These findings demonstrate a discrepancy between the values of institutions providing training to graduate students in biology and the expectations of the institutions likely to hire these individuals for faculty positions. Specifically, the data strongly suggest that the majority of jobs in academia require experience and skill in the classroom. Programs such as Preparing Future Faculty (PFF) provide one model for improving graduate education. PFF is administered through the Council of Graduate Schools and works through doctoral institutions to provide graduate students the opportunity to learn about faculty life at a diverse range of partner institutions, to be mentored by faculty at those institutions, and to gain knowledge and experience with teaching. More information is available at http://www.preparing-faculty.org/.

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Picturing Science Producing Art

Roger Hangarter and Artist Dennis DeHart Team Up to Produce sLowlife

A relatively new concept has experts in seemingly unrelated fields teaming up to help understand and solve the world's mysteries. This new methodology, commonly referred to as interdisciplinary study, has penetrated all areas of study and research and has led to amazing discoveries. The areas where interdisciplinary work has probably made the most remarkable headway are science and medicine. Cancer researchers are working with biologists to study plants and animal hormones to create new cancer drugs and therapies. Geneticists are teaming up with agriculturalists to genetically modify food to create healthier, stronger, disease-resistant crops.

However, it is not only a science/science collaboration that yields exciting new insights; science/art collaborations are also producing interesting results. Take, for example, what happened when ASPB past president Roger Hangarter combined his life's work of studying plant life with Dennis DeHart's passion for art to create an exceptional exhibit titled "s*L*owlife." The exhibit, which may be seen over the upcoming months at the U.S. Botanic Garden, the Chicago Botanical Gardens, and other sites across the country, educates and entertains onlookers through Hangarter's time-lapse movies of plants and flowers bending, swaying, and moving, and DeHart's brilliant use of photographs and prints emerging in the background. The title s*L*owlife cleverly says to viewers that plants, like people, are alive and in motion, responding to changes in the world around them despite their standstill appearance.

The collaboration between University of Indiana professor Hangarter and DeHart began after Hangarter posted his movies on a website and began receiving inquiries not only from scientists and teachers but also from musicians, producers, pastors, and artists. As more artists expressed interest in Hangarter's movies, Hangarter himself started to see his films not only as educational tools but as potential art objects, and that is when he met DeHart. They began planning an exhibit, but the meeting of the minds worked slowly, too. Hangarter's priority was to show his movies for their educational quality, and DeHart saw the movies and images for their abstract art quality. DeHart finally showed Hangarter some of his abstract art of plants and vegetation. When Hangarter identified most of the plants, it was obvious to him that DeHart had a keen sense of observation and that his artistic ability would add value to the movies.

Hangarter is modest when he discusses how his movies originated. He set up a web camera and filmed plants in his office for hours on end with pictures taken every five minutes to measure how the plants responded to stimuli. Although he knew that plants moved, having watched many time-lapse nature films, he was nonetheless amazed to discover that the plants he works with every day moved as much as they did. The effects were breathtaking.

Hangarter is pleased with the attention his s*L*owlife exhibit and movies have received. Simply stated, "I'm happy if people watch them." Certainly, it would make him even happier if the exhibit helps viewers better connect with nature and take care of it.

For more information, please visit Roger Hangarter's website "Plants in Motion" at www.plantsinmotion.bio.indiana.edu.

This article is based on Jeremy Shere's "(Un)still Life with Plants," published in the Indiana University Research & Creative Activity Magazine, *Volume XXVII, Number 2.*

Estate of Louise P. Romanoff Makes Gift to Education Foundation

Louise P. Romanoff has left donations through her estate to the ASPB Education Foundation. Romanoff, who died in August 2004, contributed through her estate $70,000 to the Foundation.

Romanoff was a graduate of Brown University. She joined the Worcester Foundation for Experimental Biology in Shrewsbury, Massachusetts, as a staff scientist in 1946 and worked there for 31 years. She studied the effects of aging on the steroid hormone metabolism of the human adrenal cortex. During World War II, she was an analytical chemist at the U.S. Industrial Alcohol Co. in Maryland and a biochemist at Worcester State Hospital. She was a member of Sigma Xi, the Endocrine Society, the Gerontological Society, and the Society for Andrology. She contributed to or authored more than 40 scientific publications. She was a member of the Worcester Art Museum and Tower Hill Botanical Gardens.

Louise Romanoff was married to Dr. Eli Romanoff, who was a deputy director of the National Science Foundation for many years and who received the ASPB Adolph E. Gude, Jr. Award in 1995 for outstanding service to the science of plant biology.

Marilyn Griffith

Marilyn Griffith, a member of both ASPB and the Canadian Society of Plant Physiologists (CSPP), died suddenly on February 19, 2005, due to complications arising from a stroke. Marilyn gained international recognition for her research on cold hardiness in plants, particularly in winter rye and more recently in *Thellungiella.* Her discovery of plant antifreeze proteins led to successful collaborations with scientists in many disciplines. The focus and integrity she brought to her work resulted in a collection of highly cited publications and a cadre of highly trained students and postdoctoral fellows. Her colleagues respected her knowledgeable, honest, and principled opinions. Marilyn will be greatly missed, especially by CSPP, which benefited from her enthusiasm and commitment to research in plant biology.

Born in 1953, Marilyn received a B.A. in 1975 from Mount Holyoke College, in Massachusetts, a master's degree in forestry science from Yale University in 1977, and a Ph.D. in plant physiology from the University of Minnesota in 1981. She was a Killam Postdoctoral Fellow at the Department of Botany, University of British Columbia, in 1981–1982, and afterward joined Norm Huner as a postdoctoral fellow in the Department of Plant Sciences at the University of Western Ontario, where she worked from 1982 to 1984. It seemed that Marilyn's professional training was on a northern trajectory, especially for the next step in her career. From 1984 to 1987, she served as assistant professor at the Agricultural and Forestry Experiment Station at the University of Alaska–Fairbanks. In 1987, she moved south to become an assistant professor in the Department of Biology at the University of Waterloo, where she was promoted to the rank of associate professor in 1994 and later to full professor in 2000. In 2003, she was recognized as a Killam Research Fellow, a prestigious title she held at the time of her death.

Marilyn will be remembered as an outstanding and creative scientist. She authored or coauthored more than 80 research publications; her innovative research led to four patents relating to cold tolerance of plants, and she was the founder and a member of the board of directors of Ice Biotech, Inc. She enjoyed many active roles in the plant biology community, and her expertise and insight were much sought after. She served on the Grant Selection Committee in Plant Biology, NSERC (2000–2003); as associate editor, *Canadian Journal of Botany* (2005); subject editor, *Physiologia Plantarum* (1998–2001); minireview editor, *Physiologia Plantarum* (1995–2005); eastern regional director, CSPP (1994–1996); and senior director, CSPP (2003–2005). She mentored many postdoctoral fellows and graduate and undergraduate students over the years, and she hosted several visiting scientists who came to share their ideas and passion for research on the mechanisms of freezing tolerance in plants. Numerous German undergraduate students visited her lab for six-month research terms, where they were exposed to her enthusiasm and high standards for science. She strongly promoted female scientists and worked hard to see women recognized for their scientific achievements. One of Marilyn's outstanding skills was her ability to draw others toward her exciting work and foster a synergistic environment that made her a great collaborator and catalyst for innovative projects.

Colleagues who worked closely with Marilyn would agree that she seldom fit her research data to existing paradigms; she sought new hypotheses to help explain her observations, and at times her work was viewed with skepticism. However, Marilyn's ability to devise new hypotheses was a talent that made her the exceptional scientist she was. Nothing would make her happier than to see her work subjected to the same scrutiny that she felt all scientific endeavors should withstand. She has left a rich legacy of scientific data and no doubt would have continued to do so had fate not deprived us so soon of a scientist of great intellect and creativity.

On a more personal note, many of us will remember Marilyn by her infectious, distinctive giggle; a smaller, perhaps "privileged," group also will have sampled her exceptional home-baked cookies. Still others will have fond memories of the woman who shared her time to help neighbors, friends, and colleagues with everything from gardening to shoveling snow. She is survived by Tim Thorne, her husband of 21 years; her parents; and her brother and sister.

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