ASPB News

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Volume 34, Number 4
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Inside This Issue

Five ASPB Members Elected to NAS

SURF 2007 Recipients Named

AAAS/ASPB Mass Media Award Winner

Breaking News

Cathie Martin, John Innes Centre, has been named the next editor-in-chief of *The Plant Cell.* She assumes her new role January 1, 2008, succeeding Rich Jorgensen.

President's Letter

Do You Believe the Universe Is Expanding?

Evolution, Elections, and Education

As I wrote in an earlier issue of the *ASPB News* (1), the Dover trial has not put the controversy over evolution to rest. A recent example: At a so-called debate (2), in which several candidates for the 2008 Republican presidential nomination participated, one of the questions was, "Do you believe in evolution?" Questions like this come from a media whose raison d'être is to maximize advertising revenue, and such questions help turn these debates into theater—an effective strategy to increase ratings and advertising revenue. Indeed, post-debate coverage reinforces this trend; much of the coverage is focused on who was the "winner" and which candidate's responses caused the crowd to cheer. (For one audience, advocating torture was a real crowd pleaser [3,4].)

Rick Amasino

One of the candidates who indicated at this debate that he did not "believe" in evolution attempted to clarify his stance in a *New York Times* op-ed (5). One of his points: "If belief in evolution means simply assenting to microevolution, small changes over time within a species, I am happy to say, as I have in the past, that I believe it to be true." In other words, "evolution" is OK if evolution can be redefined so that no new species result from it. Humpty Dumpty—who said to Alice, "When I use a word, it means just what I choose it to mean—neither more nor less"(6)—would approve.

To be "balanced," I should mention a so-called presidential forum in which the current top three candidates for the 2008 Democratic presidential nomination participated (7). The forum, which was a special edition of the Cable News Network show *The Situation Room,* began with the following statement from the moderator: "Tonight, we expect to tackle some of the most important moral issues of our times." The first question was, "*Do you believe in evolution, or do you believe in creationism?*" The follow-up question indicated that the intent of this line of questioning was to address whether or not the candidate believed in a literal interpretation of scripture: "*There are some people who say, . . . Isn't it mutually exclusive? I mean, either man was created by, you know, from Adam's rib or, in fact . . . man came evolutionwise from apes? Aren't the two mutually exclusive?*" (Some other "important moral" questions asked of the candidates are listed in footnote 7, and a reference to one reasonable view of the relationship of science and scripture is in footnote 8.)

Consider possible candidate responses to two questions that are similar to "Do you believe in evolution?" To "Do you believe the universe is expanding?" a possible response might be, "I am not sufficiently familiar with the data at this time to provide an informed answer to that question." This answer

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would likely be acceptable to the media, because whether or not the universe is expanding is not, at present, a "hot-button" issue. Because evolution is a hot-button issue, a similar "not sufficiently familiar" response to the evolution question would result in this issue being repeatedly raised. Thus, the candidates must answer, even if they have not had an opportunity to adequately explore the data (for example, during their undergraduate education).

To "Do you believe in the heliocentric view of our solar system?" a reasonable response might be, "Copernicus and Galileo made compelling arguments that the heliocentric view was the best interpretation of the data available several centuries ago, and all of the data obtained since that time have supported the heliocentric theory." If "Darwin" and "evolutionary" were substituted for "Copernicus and Galileo" and "heliocentric," this would be a concise and complete answer to "Do you believe in evolution?" The heliocentric answer would be broadly accepted, in large part because much of the data supporting the heliocentric view, such as satellite views of the solar system, are not only simple to interpret but have been well presented to the public in movies and other venues of popular culture. Thus, it is no longer possible to frame the heliocentric view as a threat to certain religious beliefs, as was the case during the time when Galileo went before an inquisition. In contrast to the heliocentric view, however, the data supporting evolution are not as simple and accessible. Is there any possibility that evolution might someday be as widely accepted as the heliocentric model of our solar system? Perhaps, but only if people are properly exposed to the ideas and the evidence.

The theory of evolution and the body of knowledge supporting it are, of course, rich and varied, and all of the data gathered since the publication in 1859 of Darwin's *On the Origin of Species by Means of Natural Selection* (9) have provided overwhelming support for Darwin's (and Wallace's) ideas. Yet we cannot expect others who have not had an opportunity to explore the vast and rich data to simply accept evolution because scientists say it is so. There are many reasons for this, and I note two of them. One is that in the eyes of the public, not all scientists accept evolution. The media do not have the ability to ascertain who is a scientist, and as long as there is a market for this "controversy," the media will continue to present the views of people they label "scientists" who claim to present "evidence" to refute evolution. We cannot blame the public for their inability to distinguish a scientist from someone impersonating one if both are presented as scientists. The other reason is that it is human nature to want to consider the data and arrive at one's own conclusion (10). This is how we operate as scientists, and we ought to make every effort to provide this opportunity to others.

Can we do a better job of providing others the opportunity to explore evolution? It is difficult to do this in sound bites or debates (although casting doubt on the validity of evolution is quite effective in sound bites and debates). The rich and varied body of knowledge supporting the theory of evolution and its fascinating history requires time to reasonably explore (e.g., the better part of a semester). How many of our courses devote sufficient time to allow students to immerse themselves in this topic and arrive at their own conclusions?

The most important teaching in which we, as scientists, participate may be the science courses for students who are *not* science majors. College-educated people who are not science majors will make up a significant fraction of the viewers of future presidential media events, and some of them will be framing the questions for these events.

Many students who are not science majors will take only a single college-level course in a biological science. For such a student, is there any topic in biology better suited to teach critical thinking than an exploration of the data in support of evolution and of the various ways in which data are cherry picked or manipulated to claim lack of support?

An exploration of evolution is a great topic for someone who will take only one biology course. Is there any topic in biology with a more fascinating history? Is there a biological question that is more inherently interesting to most people than where we came from? And should not one of the most profound ideas ever to come from biological science be a cornerstone of a higher education?

Are the "Plants and People" courses, or the equivalent nonmajors courses offered to those who take a single biology course, doing all that could be done to enable students to arrive at their own conclusions as to whether, as Darwin stated (9), "from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved"? Do our nonmajors courses lead to an appreciation of the fact that, as Dobzhansky (11) clearly stated, "nothing in biology makes sense except in the light of evolution"? Or, put another way, might there come a time when the presidential "debate" question "Do you believe in evolution?" generates yawns of boredom rather than increased advertising revenue?

Richard Amasino
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REFERENCES

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2. A link to the transcript of this "debate" is at http://www.msnbc.msn.com/id/18478985/.
3. See Rosa Brooks's article at http://www.latimes.com/news/opinion/commentary/la-oe-brooks18may18,0,732795.column?coll=la-news-comment-opinions.
4. See the Colbert Report—2nd Republican Debate at Comedy Central: Motherload at http://www.comedycentral.com/motherload/?lnk=v&ml_video=87158.
5. See Sam Brownback's *New York Times* article at http://www.brownback.com/s/NewsRoom/PressReleases/WhatIThinkAboutEvolutionNYTimesOpEd/tabid/363/Default.aspx.
6. Lewis Carroll. (1871). *Through the Looking-Glass, and What Alice Found There.* London: Macmillan.
7. A transcript of this forum is available at http://transcripts.cnn.com/TRANSCRIPTS/0706/04/sitroom.03.html. Other questions from this forum included the following: "Do you think homosexuals have the right to be married?"

"Do you think this is a Christian nation?" "How would prayer influence the decisions that you make as president? And, most importantly, when you pray, how do you know if the voice that you are hearing is the voice of God or your own voice in disguise?"

The questions at the forum were the purview of each questioner. One of the participants, Jim Wallis, editor in chief of *Sojourners* magazine, did in fact focus on topics that I would consider "important moral issues," and his questions can be found at the website containing the transcript.

8. The issue of scripture in relation to science was clearly addressed by Father George V. Coyne, a Catholic priest and director of the Vatican Observatory. Some of his remarks and a link to a talk he gave are in the May/June 2006 issue of the *ASPB News,* available at http://www.aspb.org/newsletter/mayjun06/07dover.cfm. See also the Clergy Project, which is described at http://www.butler.edu/clergyproject/religion_science_collaboration.htm and was also discussed in the May/June 2006 *ASPB News.*
9. Charles Darwin. (1859). *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.* London: John Murray. http://darwin-online.org.uk/content/frameset?itemID=F373&viewtype=text&pageseq=1.
10. Galileo Galilei concisely stated this point: "You cannot teach a man anything; you can only help him find it within himself." This is obvious, but how many courses are taught with this as a guiding philosophy?
11. This quote from Theodosius Dobzhansky is the title of an article he wrote for *The American Biology Teacher,* March 1973 (35:125–129). A copy is available at http://www.2think.org/dobzhansky.shtml.

Christina Pince Awarded 2007 AAAS/ASPB Mass Media Fellowship


Christina Pince

Christina Pince, of the University of Washington, is the 2007 recipient of the Mass Media Science & Engineering Fellowship sponsored by the American Association for the Advancement of Science and ASPB. She will spend 10 weeks reporting science news for KUNC FM, a public radio station in Greeley, Colorado. Christina is currently a Ph.D. candidate in the Department of Biology at the University of Washington in Seattle, working under the tutelage of Dr. Toby Bradshaw. She has spent the past four years there studying evolutionary and developmental genetics in the plant genus *Mimulus* through the creation of mutant plants. She is the cofounder of the Biology Department's Natural History Seminar Series and maintains a science blog for the *Seattle Post-Intelligencer.* She is also a radio DJ for the University of Washington student radio station, Rainydawg Radio, and has participated in numerous outreach activities to help share science and nature with the general public. She hopes to pursue a career in science communication and is excited to have this opportunity to learn more about science news reporting and radio production.

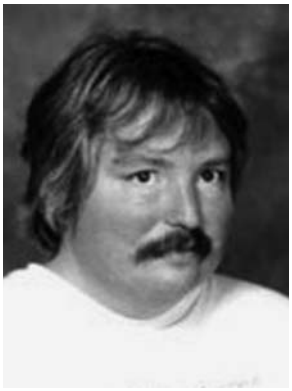
The Plant Cell Joins JSTOR

We are delighted to announce that *The Plant Cell* has been released in JSTOR, the scholarly journal archive, for the years 1989 to 2004 as part of the JSTOR Biological Sciences collection. Readers are directed to http://www.jstor.org/journals/10404651.html and http://www.jstor.org/journals/aspb.html.

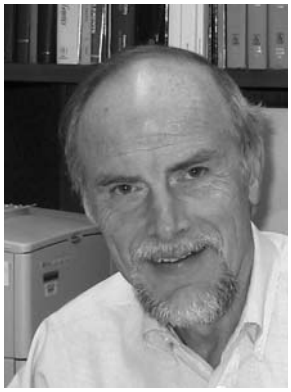
JSTOR's mission is to help the scholarly community take advantage of advances in information technologies. It is a not-for-profit organization with a dual mission to create and maintain a trusted archive of important scholarly journals and to provide access to these journals as widely as possible. JSTOR offers researchers the ability to retrieve high-resolution, scanned images of journal issues and pages as they were originally designed, printed, and illustrated. The journals archived in JSTOR span many disciplines.

Originally conceived as a project at The Andrew W. Mellon Foundation, JSTOR began as an effort to ease the increasing problems faced by libraries seeking to provide adequate shelf space for the long runs of backfiles of scholarly journals. JSTOR is not a current issues database. Because of JSTOR's archival mission, there is a gap, typically from one to five years, between the most recently published journal issue and the back issues available in JSTOR. *The Plant Cell* will be released in the JSTOR archive after a three-year embargo. *Plant Physiology* is being scanned now and will be available in the JSTOR Biological Sciences collection by the end of the year.

ASPB Members Dangl, Dixon, Dooner, Estelle, Zhang Elected to National Academy of Sciences


Jeffery Dangl


Richard Dixon


Hugo Dooner


Mark Estelle
Photo courtesy Indiana University


Qifa Zhang

The National Academy of Sciences (NAS) announced May 1 that newly elected members include ASPB members Jeff Dangl, Richard Dixon, Hugo Dooner, and Mark Estelle. ASPB member Qifa Zhang is a newly elected foreign associate. This is a significant representation of ASPB members and plant science in this class of 72 members and 18 foreign associates, who were elected from across all science disciplines in recognition of their distinguished and continuing achievements in original research.

Jeffery Dangl

When Jeff Dangl heard of his election to NAS, his reaction was first very excited and then more modest. "It's a humbling experience. I was of course elated and very happy. Hearing that Mark Estelle, Hugo Dooner, and Rick Dixon had also been elected made it clear that the profile of plant sciences is being raised by the current NAS members. That is also very important."

Dangl earned his BA, MS, and PhD from Stanford University, double majoring in biology and English. He earned his MS in biological sciences and his PhD in genetics in 1986.

Dangl spent the first part of his career in Germany as an NSF plant molecular biology doctoral fellow at the Max-Planck-Institüt für Züchtungsforschung in Cologne from 1986 to 1989. He then was a group leader (assistant professor equivalent) at the Max-Delbrück Laboratorium, also in Cologne. Since 1995, Dangl has served as professor at the University of North Carolina, Chapel Hill, and has been John N. Couch Professor since 2000.

Dangl's current research topics focus on *Arabidopsis* as a model to identify and isolate loci necessary for disease resistance responses and molecular mechanisms of disease resistance and plant cell death. Dangl also researches *Pseudomonas syringae* Type III effectors, bacterial and plant genomics, and ancient immune systems.

Dangl thanked the whole *Arabidopsis* genetics and genomics community, "which has been hugely influential since its beginnings in the 1980s and continues to be, as an excellent community to nurture plant biologists."

Richard Dixon

Upon hearing news of his election to NAS from Bob Goldberg, Richard Dixon, director of the Plant Biology Division at the Samuel Roberts Noble Foundation, was simply stunned. "It took several seconds for it to sink in!" After talking to Ron Phillips, Jan Zeevaart, Gene Nestor, Bernie Phinney, Rick Amasino, Sue Wessler, Jim Van Etten, Bill Ogren, and Maarten Chrispeels, Dixon was finally able to believe the good news. "It was certainly a moment I will never forget."

Originally from England, Dixon earned his undergraduate degree in biochemistry from the University of Oxford in 1973 and his MA and PhD, also from Oxford, in 1976. Dixon has been with the Samuel Roberts Noble Foundation since 1988 and has served as senior vice president since 2006. Dixon's research concerns plant natural product biosynthesis. His research centers on understanding how plants produce certain natural compounds and using metabolic engineering to modify the production of such compounds to improve plant performance and, in many cases, benefit human and animal health.

Dixon has been recognized with many rewards and honors. His most recent recognitions include Pioneers in Genomics Lecturer from the University of Illinois in 2006, Loomis Lecturer from Iowa State University in 2005, and the Dermot Coyne Distinguished Lectureship from the University of Nebraska in 2004. Dixon was also named a "Top Principal Investigator" in *Science* in 2004 and was elected fellow of the American Association for the Advancement of Science in 2003.

In his career, Dixon has served on a number of committees and editorial boards, most

recently for the Technical Advisory Committee for the Oklahoma Center for the Advancement of Science and Technology.

After having some time to process his election to NAS, Dixon said, "On reflecting a few minutes later, I recalled a conversation I had with Chris Lamb, now director of the John Innes Centre, when I was on sabbatical in his lab at the Salk Institute in 1987. Chris had pointed out that the Noble Foundation was looking for a director for a new venture in plant biology—I particularly remember his saying that this had the potential to become an internationally recognized center, and would I perhaps consider making the move from London to Ardmore, Oklahoma. I thought this might be an interesting challenge, but, at the time, I could not conceive of how things have turned out.

"Chris was clearly an early inspiration. I must also acknowledge immense debts to John Snodgrass, the Noble Foundation president who hired me and set the Plant Biology Division on its way; to Mike Cawley, the current president, who has helped nurture an excellent environment for science in Ardmore; to the Noble Foundation's board of trustees for their continuing financial support that has helped provide continuity to my programs and to those of my colleagues; and, of course, to the long list of just fabulous postdocs, technical staff, and students who have done the experimental work that underlies this honor."

Hugo Dooner

Hugo Dooner of Rutgers University received news of his election to NAS early in the morning from Sue Wessler. "She told me to sit down, but of course, I did just the opposite. I stood up and talked excitedly with her and other members of Section 62 (Plant, Soil, and Microbial Science) who wanted to pass on their congratulations to me for this great honor. I was surprised at how emotional one can become when communicating exceptionally good news." Dooner was so excited that after calling his wife, he e-mailed his grown children in California at 6:00 a.m.

Dooner received his BS in biology from the University of Notre Dame in 1965 and his PhD in genetics from the University of Wisconsin in 1971. He has taught at Rutgers University since 1994 and has been professor II in the Department of Plant Biology and Plant Pathology since 2003. He has served on the *Maydica* editorial board since 1987 and has been chairman of the Maize Genetics Nomenclature Committee since 2002, along with contributing to a number of publications.

Dooner thanked a number of people who helped him in attaining this coveted position in his career. "I have learned from everyone that I have been associated with, but from none more than Jerry Kermicle and Oliver Nelson, my PhD and postdoctoral advisers at Wisconsin, who mentored me during my formative years as a scientist and provided me with a strong foundation in genetics. I would like to credit my coworkers Ed Ralston and Jonathan Jones at AGS–DNAP in California, from whom I learned a great deal of molecular biology as we worked jointly on maize transposons to learn about their properties and to develop them as genetic tools in maize and dicots. And more recently at Rutgers, I would like to acknowledge Huihua Fu, who brought haplotype-specific bacterial artificial chromosome cloning to my lab, a technology that has enabled us to combine genetics and genomics experiments to learn about the recombination behavior and huge structural variability of the maize genome. I could name many others who have helped me along the way, but the people above are those who have had the strongest influence on changes in research direction that I have made during my career."

Mark Estelle

The news of Mark Estelle's election to the National Academy of Sciences was delayed because of Starbucks. "Jeff Palmer informed me as I was walking down the hall to my lab. Elliot Meyerowitz had tried to call me, but I was sitting in Starbucks reading a thesis. I was very excited and a bit overwhelmed by the news."

Originally from Canada, Estelle earned his BSc with honors in genetics from the University of Alberta, Edmonton, in 1978. He also earned his PhD in genetics from the University of Alberta in 1983.

Estelle has been teaching at Indiana University, Bloomington, since 1986. He has been a full professor and the Carlos O. Miller Chair of Plant Developmental Biology in the Department of Biology at Indiana University since 2002. He has been honored with a number of fellowships, grants, and awards, including the Senior Class Award for Teaching Excellence from Indiana University in 1995 and the Kumho International Science Award in Plant Molecular Biology in 2006. He was elected fellow of the American Association for the Advancement of Science in 2003. Throughout his career, he has contributed to a number of publications, including *Nature, The Plant Cell,* and *Plant Physiology*.

Estelle is grateful to many people for this honorable election, but, he said, "I would particularly like to thank my colleague Carlos Miller for his support."

Qifa Zhang

Qifa Zhang was born in Hubei Province, China, in 1953. Zhang earned his BS in agronomy in 1976 from the Huazhong Agricultural College, China, and his PhD in genetics in 1985 from the University of California, Davis.

Zhang is currently professor at Huazhong Agricultural University, Dean of the College of Life Science and Technology, and director of the National Key Laboratory of Crop Genetic Improvement. He has focused his research on and provided leadership in the genomics and biotechnology of rice in China. His research achievements include the genetic analysis, identification, mapping, and functional characterization of genes for agronomically important traits of rice, including yield, grain quality, male sterility and hybrid fertility, plant architecture, phenology, nutrition efficiency, drought resistance, and disease and insect resistances; the characterization of the genetic basis of heterosis in hybrid rice; the establishment of technologi-

continued on next page

Jan Leach Appointed University Distinguished Professor at Colorado State University

Colorado State University President Larry Edward Penley today bestowed the title of University Distinguished Professor—the highest recognition awarded for outstanding accomplishments in research and scholarship—on four professors at the annual Celebrate Colorado State luncheon. Among them was ASPB member Jan Leach. "These fine individuals join a very small, prestigious group of University Distinguished Professors because of outstanding accomplishments in their respective fields," Penley said. A maximum of 12 current faculty members at the university hold the rank of University Distinguished Professor, which is a permanent designation that carries into retirement.


Jan Leach

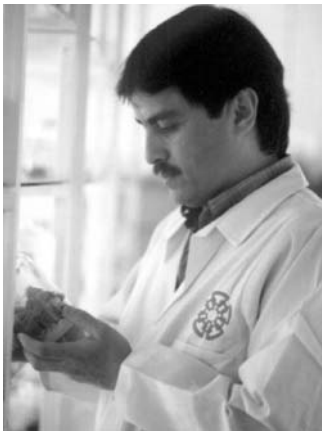
Leach is an authority on the molecular biology of plant–pathogen interaction. She is a fellow of the American Association for the Advancement of Science (AAAS) and chairs the AAAS agriculture section, and she is president of the American Phytopathological Society. She is a member of the American Society for Microbiology Committee on Agriculture and Food Microbiology and a fellow of the American Academy of Microbiology. She served as president of the International Society of Molecular Plant–Microbe Interactions from 1999 to 2001. She also served as an advisory board member for the U.S. Rice Genome Sequencing Project from 2000 to 2004.

Plant Scientist Herrera-Estrella Awarded Trieste Science Prize

On April 26, 2007, Luis Rafael Herrera-Estrella, professor of plant genetic engineering at the Center for Research and Advanced Studies in Irapuato, Mexico, was awarded the Trieste Science Prize, along with Goverdhan Mehta of India.

Herrera-Estrella's research focuses on "pioneering plant-biotechnology techniques used in the commercial production of genetically modified plants."

These scientists' achievements are even more noteworthy because of the difficulties in conducting research in developing countries. "Doing high quality science in developing countries is far more difficult than in developed countries," Herrera-Estrella told SciDev.Net. "Recognition from important awards such as the Trieste Science Prize is very important in making politicians aware that in spite of the difficulties, scientists in developing countries have the skills and expertise to produce first-class science."


Luis Rafael Herrera-Estrella

The Trieste Science Prize has been established to give international recognition and visibility to outstanding scientific achievements made by individual scientists from the developing countries. The prizes are awarded annually and rotate among the various fields of science. In 2007, prizes were awarded in the chemical sciences and agricultural sciences.

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cal platforms for functional genomic studies, including large T-DNA insertional mutant libraries, cDNA microarray, and full-length cDNA for large-scale gene discovery; and the improvement of hybrid rice by enhancing grain quality and disease and insect resistances using molecular markers and transgenic technologies.

Zhang has published more than 140 highly appraised research articles in international journals and delivered plenary speeches at many international scientific conferences. He has received numerous awards from the Chinese government, international agencies, and foundations. He was elected to the Chinese Academy of Sciences in 1999 and to the Third World Academy of Sciences in 2000.

The NAS news release is at http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=05012007.

Postcards from Sarah

ASPB's 2005 AAAS Mass Media Fellow Sarah Nell Davidson is sending a series of "postcards" back to the ASPB News *as she spends the current academic year abroad doing research for her PhD thesis.*

High tide in the Sundarbans.

Sundari trees in a sea of aerial roots.

Armed forest service workers protect visitors from possible encounters with Bengal tigers.

Greetings from the Sundarbans—The Largest Contiguous Tract of Mangrove Forest on Earth

Bangladesh is roughly the size of England and Wales combined. Yet as much water flows through Bangladesh as through all of Europe. The river system is the ebb and flow of Bangladeshi life, as nearly all of its 140 million people are dependent on this vast network of river systems in carving out their livelihood.

Where the Ganges, the mighty Meghna, and the Brahmaputra Rivers pour into the Bay of Bengal, an 80,000-square-kilometer delta is formed, fringed by the largest contiguous tract of mangrove forest on earth—the Sundarbans. Although the Sundarbans may be most famous for its man-eating Royal Bengal Tiger population, their likely namesake is an endemic tree, the Sundari tree *(Heritiera fomes)*—the real king of this estuarine jungle.

My companion, a self-described GIS (geographic information system) geek from Redlands, California, and I venture south from the capital city of Dhaka on a 30-hour trip through Bangladesh's river superhighways. Once we arrive in Mongla Port, the gateway to the Sundarbans, we are met by our guide, Bachchu, who's aboard a more modest boat equipped for four. It is from this boat and the small rowboat we have in tow that we set out in search of tigers, Sundari trees, and the more than 270 bird species that inhabit the 601,700 hectares of forest reserve. The following morning, we pick up our own armed Bungalow Bills—two guys from the local forest service—who offer us protection as we venture on foot into the home range of the Royal Bengal Tiger, which has been known to attack humans. Although a run-in with an actual tiger is not in our cards, we do spot fresh tracks among the mat of the Sundaris' aerial roots.

Like the Notre Dame cathedral, the Sundari tree, which slowly grows to 25 meters, relies on substantial buttresses for support in this brackish intertidal zone. Its aerial roots look like a sea of gnome's caps protruding through the forest floor. Prized for their hardwood and straight growth, these trees have been plucked from their forest home for centuries and used in the production of boats, electricity poles, furniture, and charcoal. The overexploitation of the Sundari tree and other cohabitants has resulted in a 25% decrease in the productivity of this forest over the past 25 years. Although restrictions are now in place to prevent overharvesting of the Sundari tree, in a country where forest workers are paid very little and corruption prevails at every rung of the ladder, a small cut from a poacher's bounty ensures a turn of the head.

A more serious threat to the Sundari tree originates upstream. Roughly 30% of Sundari trees have fallen victim to "top dying disease." As suggested by its name, symptoms appear at the top of the main stem and progress downward, resulting in leafless trees that meet an early end. Although the disease was first reported in the Sundarbans in the 1930s, it was rare and manageable until it became widespread in the 1990s.

Over the past two decades, various studies have sought to ascertain the cause of top dying. Although many locals adhere to the theory that it is caused by a virus, the chief conservator of forests in the Sundarban region, Shaikh Mizanur Rahman, explains that it is in fact caused by an increase in salinity and siltation. Whereas the western region of the Sundarbans has always been

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more saline (and its Sundari trees less abundant and dwarfed), the eastern portion has enjoyed a greater fresh water flow, creating the unique habitat that typifies this part of the region. The more abundant plant life in the eastern half supports many more herbivores, such as the spotted deer, which in turn support the tiger population; both of these species are rarely found in the western half. A major reduction in the amount of fresh water flowing into the eastern region, however, has thrown the system out of balance.

It isn't difficult to ascertain the cause of this decrease in fresh water flow. One has only to look 15 kilometers beyond Bangladesh's borders to the Farakka Dam, which chokes the Ganges in neighboring West Bengal, India, diverting much of it to the Hooghly River, bound for Calcutta. Rahman reckons that during the dry season, the amount of water flow that makes its way to Bangladesh after passing through the Farakka Dam has been reduced by 75%, altering the delicate balance of sweet and salty in the river's delta and causing major siltation problems as the trickle heads downstream.

Khan Alaluddin, a physicist at nearby Khulna Public College who studies the effect of increased salinization on the properties of Sundari wood, says that the normal level of salinity in the eastern region of the Sundarbans was about 3.5% to 4.0% on average. Areas of the west are up to 18.0%—a level that the Sundari tree cannot tolerate. As salinity increases in its eastern habitat, the Sundari tree loses its inherent ability to cope with its saline environment.

As our physiologists back at Cornell explained, it's all about water potential. "Pure water enters a cell easily, because water potential outside is higher than inside the cell. If the soil has a lot of salt, it lowers the potential, and there is less drive for water to move into the leaf cells," Bob Turgeon explained. Because gravity is also at work, it is hardest for leaves at the top of the tree to get water, which may be why the Sundari—the Sundarban's local giant—is having the hardest time coping.

Roger Spanswick continued my refresher course in plant–water relations. "With an increase in salinity, if the cells in the leaves do not adjust to this decrease in water potential, they will lose turgor, and the stomates will close. To avoid wilting, the cells must accumulate more solutes to make their osmotic potential more negative. Aside from avoidance of wilting, the maintenance of a positive turgor pressure is important as the physical driving force for cell expansion and hence leaf expansion growth"—thus the balding of the Sundari.

The Sundari tree experiencing high tide.

But as I am reminded by another of my home-based physiologists, Tom Owens, "One cannot neglect the direct or indirect effects of higher salt concentrations on a wide variety of processes other than water transport. High solute concentrations in general, and specific ions more commonly, can screw up metabolism and transport at many different levels." This metabolic mix-up might explain why in this new salty predicament, the Sundari tree is unable to fend off other diseases caused by viruses and fungi, resulting in a veritable field day for a plethora of pathogens.

Interestingly, Alaluddin's studies on wood composition show that the increase in salinity has caused a major shift in wood composition, from its natural hardwood state to that more typical of soft woods; percent cellulose decreases, and percent lignin increases. He estimates that a 10% increase in salinity results in a 1% increase in wood softness.

Chief Conservator Rahman says he doesn't subscribe to the widely accepted forecast that global climate change will cause ocean levels to rise significantly by the year 2050. "Some people say that due to greenhouse effect, the sea level will rise, and the Sundarbans will be under water," he begins. "This may not happen, because siltation rate is higher than the rate of rise of sea water. That we will have a higher level of water—that is not true." Fortunately, other local ecologists are more pragmatic. With the Ganges choked upstream, several rivers that contribute fresh water to the delta are already dead. An increase in sea level in the Bay of Bengal will exasperate the salt problem tremendously and may mean the end not only of the Sundari tree, but of the entire delicate ecosystem of the Sundarbans, tigers and all.

When I asked Rahman what the plan is to save the Sundari, his response was casual but for me bore much grimmer political undertones. "I am conservator of this forest," he begins. "This sudden change in the environmental ecosystem is beyond my control," he continues, blankly staring at a map of the Sundarbans before him. "If these trees are dying, we can take them out, because as a country we are short on wood." And most conveniently for wood harvesters, it is the tallest trees that are most severely affected. Rahman continues, "So what is happening, there will be some changes in vegetation patterns. Big Sundari trees are dying, and this area is now covered by a new species, Gewa *[Excoecaria agallocha]*—so more Gewa are coming in." Rahman seems strangely comfortable with this outcome.

Whether the Sundarbans will soon be renamed the Gewabans, or whether the Bay of Bengal will swallow up the forest in its entirety, this unique wonderland is in a critical state of threat. Bangladesh may not have the resources or political will to save the Sundarbans, but the people of Bangladesh are proud to be its primary stewards. Fortunately, an increasing number of nongovernmental organizations in the area are making the welfare of the Sundarbans their mission. For, as one tourism poster reminds them, "It is our Taj Mahal, it is our Everest."

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A Day in the Life of a Plant Sciences Journal Editor

by Jennifer Henry
Editor, Functional Plant Biology; *jennifer.henry@csiro.au*

When I first started this job, I had afternoon tea with my great aunt. They had only just discovered photosynthesis when she was at school. She probably wasn't even given the opportunity to study science. So, despite my spending about half an hour describing what I do, by the end of the afternoon tea, I think she thought that I wrote a gardening column for a homemaking magazine. She spent the next hour giving me little tips to put into my column ("Collect the cold water from the kitchen tap while you are waiting to fill the kettle with hot water, and use it to feed your pot plants all around the house."). I sent her a sample copy of the journal, which I hoped would clarify things, but she then bemoaned, "Oh, Jennifer, when are you going to write an article for your magazine?"

The general public does not tend to know how peer-reviewed journals work. When I try to explain my role as a journal editor, people are surprised that there is enough new information to publish one issue a month. I then tell them that there were, at last count, 136 journals in ISI's Plant Sciences category. That absolutely floors them. "Don't they already know most things about plants?"

Maybe these anecdotes tell more about the people with whom I choose to spend my leisure time than about the general level of understanding out there of how journals work. Well, I am here to tell you, the fully versed plant scientist, about what I do for a living and why it thrills me every day to come to work!

A Typical Day

In the morning, I assess new manuscripts that have been submitted overnight and consult a member of the editorial board about the quality, novelty, and importance of the work. If the manuscript clears that hurdle (around 40% don't), together we select potential reviewers. I also find reviewers from our internal database by matching keywords or by searching the literature through ISI to see who has recently published in that area.

These reviewers are invited via our online system. My editorial assistant and I then chase reviewers who have not yet responded to earlier invitations and invite more reviewers. This is all in an attempt to have the manuscript out to two reviewers within one to two weeks of submission. It is a saving grace that reviewers are also authors, so they know how frustrating it is to have to wait endlessly for a verdict on a manuscript!

I then spend a fair chunk of the day reading reviews and seeking the occasional adjudication from an editorial board member when the reviews are in stark contrast. I also send verdict letters to authors. I make a point of sending the reviewers a copy of my verdict and attaching the other review, so they can benchmark themselves against another opinion. There are also author inquiries to deal with, such as "Is this abstract in the scope of your journal?" to "What's happening with my manuscript?" and "Can you please send a PDF reprint to these authors on my behalf?"

In the afternoon, I get into "special projects." These involve marketing or strategy, such as a review paper, planning a themed special issue, or writing columns such as these. I also plan the annual editorial advisory committee meeting and follow up on actions arising from the previous meeting. In the late afternoon, I check for any new manuscripts that have been submitted that day and try to get them out to an editorial board member for perusal. Although it may sound like I am very good at handballing tasks off my desk into the laps of others, I am trying to speed up the handling time on all submissions so that the author gets an answer as soon as possible. One of the many things I love about running this journal from Australia is that I have so many editorial board members in the northern hemisphere (mostly Europe and the United States). If I get my requests for reviewer suggestions out to them before I leave at the end of the day, I often have a response back overnight. I feel that someone is working on the journal 24 hours a day.

A few times a year, I visit a relevant institution or department to give a seminar on journal publishing. Students often like to hear how the peer review process works from a perspective other than that of their supervisor (who may well have his or her own biases). So, to answer questions proposed for writers of this column:

What preparation and talents do you need?
You need to be passionate about where the commas go! Our tearoom discussions are a hoot—full of anecdotes about lousy spelling or punctuation that we have seen on signs or in newspapers over the weekend. You need the scientific background, but also the sharp eye to spot flaws.

How do I contribute to science?
I hope that I help facilitate the dissemination of information: research findings between labs, ideas for future research between groups, and suggestions for improving experimental design and analysis between.

I think it is fair to say that an editor is primarily a judge, not of the quality of the science per se, but of the suitability of the manuscript for publication in the journal to which it has been submitted. Is the message of the article novel? Will the time we invest in adding value to this article reward us, as the publisher? Possible rewards include citations, subscriptions, and incoming manuscripts to keep on publishing! Therefore, an editor in the current era needs to combine scientific knowledge with a business head.

CALL FOR PROPOSALS

WSSA Undergraduate Research Award—2008

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

AWARD

Up to $1000 for support of undergraduate research to be conducted over a minimum of one quarter/semester during 2008. This award may be used to defray the cost of research supplies or as a stipend. support of a faculty sponsor is required. Awards will be made to the student, to be administered by the faculty sponsor's department.

APPLICANT

The applicant is an Undergraduate student with a strong interest in weed science. Students majoring in all related disciplines may apply.

TO APPLY

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

FACULTY SPONSOR

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

HOW TO APPLY

The completed proposal, academic transcripts, cover letter and faculty letter of support should be forwarded to: Dr. John Jachetta, Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46268-1054; Phone: (317) 337-4686, Fax (317) 337-4649, e-mail: jjjachetta@dow.com. Proposals should be received no later than November 16, 2006. Funding decisions will be made by January 25, 2008 and presented at the 2008 WSSA National Meeting General Session.

Future ASPB Meetings

Plant Biology 2008
Mérida, Mexico
June 27–July 2

Joint Annual Meeting of the American Society of Plant Biologists and the Sociedad Mexicana De Bioquímica Rama: Bioquímica y Biología Molecular de Plantas

Plant Biology 2009
Honolulu, Hawaii
July 18–22

Plant Biology 2010
Montreal, Canada
July 30–August 5

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

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

The Bioethics Imperative XXX

Snowballs! Cases Made Worse by Subsequent Actions

(continued from the May/June 2007 issue of the ASPB News)

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

In a conversation in Washington, DC, in January 2007, James Kroll, head administrator for the National Science Foundation (NSF) Office of Inspector General (OIG), used the term "snowball" for cases that became worse once the OIG began to investigate an allegation. He was kind enough to relay to me some examples of this type of case. In this column I present the final two cases. The first two were presented in the May/June 2007 column; *ASPB News,* vol. 34, no. 3, p. 10.

Case 3. An allegation of plagiarism was made against a small business owned by the wife of a university professor. The primary responsibility of the professor, Dr. Noh Werk, was research in his specialty area. Dr. Werk had received a Phase I Small Business Innovative Research (SBIR) grant for $100,000 and had begun a Phase II SBIR grant with another $100,000. Analysis of the Phase I final report showed that the entire 15-page report was copied from the thesis of one of Dr. Werk's graduate students.

Investigation revealed that although the original Phase I proposal listed the former graduate student as the main researcher, the student had left the local area just as the grant was awarded and so could not possibly have fulfilled this role. Dr. Werk convinced his wife (president of the small business) to become the PI with the understanding that he would do the work. No work had ever been completed under the Phase I award, and the Phase II award was made on the basis of the fraudulent Phase I final report.

Interviews with Dr. Werk and his wife indicated that the wife was mostly a pawn in the affair—she knew little about the fraudulent efforts. Dr. Werk was submitting all the paperwork and forging her signature. When confronted, she admitted what little she knew.

This case was settled with a civil U.S. attorney. Dr. Werk agreed to pay back the $200,000. At settlement, a local judge found him guilty of filing false statements with the government, fined him an additional $15,000, and gave him a five-year suspended jail sentence. Dr. Werk also lost his position at the university.

Case 4. A university informed the NSF OIG that it had completed an investigation into alleged misrepresentations in an NSF renewal proposal submitted by a researcher. The university alleged that the proposal falsely implied that the data in one figure were gathered from the experimental system that was the focus of the proposal, that the proposal falsely claimed that two different compounds could be used to establish conditions necessary for particular experiments, and that a procedure used to prepare samples from the experimental system did not work as claimed in the proposal.

Following the university's investigation, the researcher withdrew the renewal proposal from review at NSF. Shortly thereafter, he submitted a revised renewal proposal, and NSF provided a large, multiyear award based on its contents.

The NSF OIG reviewed the results of the university's investigation and the researcher's revised proposal and decided to initiate its own independent investigation into the allegations. (Note: NSF awarded the funds because at that point there was only an allegation of wrongdoing, i.e., one is innocent until proven guilty.) The NSF review determined that the researcher's failure to identify the actual experimental system used to gather the data in the figure was misleading. The text of the proposal falsely implied that the experimental system used was the one the researcher described as the focus of his proposed research.

The researcher claimed that his renewal proposal statements about the two compounds were based on oral conversations with his graduate student. He included these statements in his proposal, even though he seriously doubted the student's experimental and recordkeeping abilities and had not reviewed the data before including them.

Although the revised renewal proposal claimed that the sample preparation procedure was suitable for the proposed experiments and that the procedure worked "routinely," the NSF OIG learned that the investigator's laboratory could rarely, if ever, gather usable data from these samples. The proposal also failed to describe the laboratory's actual abilities to prepare the samples.

The researcher's annual reports for his first NSF award claimed, as progress, preliminary data that he had collected with a collaborator two years before his receipt of any NSF research funds. In these progress reports, he also failed to acknowledge his collaborator. Further review showed that the researcher's renewal proposal did not state that his laboratory was unable to conduct the proposed research in the experimental system emphasized in his original proposal. He told the NSF OIG that he had not discussed his inability to conduct the proposed research because of NSF's proposal page limitation. Yet in place of discussions about actual progress, the researcher continued to repeat descriptions of experimental results conducted long before he received NSF support.

The NSF OIG concluded that the researcher intentionally misrepresented his laboratory's progress and its ability to conduct certain experiments to ensure continued support from NSF. The OIG also concluded that these actions constituted misconduct in science.

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Membership Corner

ASPB members share a common goal of promoting the growth, development, and outreach of plant biology as a pure and applied science. This column features some of the dedicated and innovative members of ASPB who believe that membership in our Society is crucial to the future of plant biology. If you are interested in contributing to this feature, please contact ASPB Membership at info@aspb.org.

Name: Paul Lichtman
Title: Advisor, AgriScience Research Program
Place of Work or School: Uniondale High School
Research Area: Precollege Science Research: Plant Science and Environmental Science
Member since: 2005

1. **Why has being a member of ASPB been important?**
   It provides a professional connection from motivated high school students engaged in high-level plant science to professionals in the field.
2. **Was someone instrumental in getting you to join ASPB?**
   Dr. Crispin Taylor.
3. **What would you tell colleagues to encourage them to join?**
   That it's time for precollege students to become more informed, and in the plant sciences, ASPB is the best answer.
4. **Have you enhanced your career using ASPB job postings or through networking at an ASPB function?**
   No.
5. **Have you had any success at finding candidates as a result of a job posting at the meeting or on our online Job Bank?**
   N/A
6. **Do you read print journals? If so, where do you usually read them?**
   I order them through our county library retrieval service.
7. **What do you think is the next "big thing" in plant biology?**
   N/A (at least for me at this point)
8. **What person, living or deceased, do you most admire?**
   George Washington Carver—with so little, he accomplished so much. His humility is legendary.
9. **What are you reading these days?**
   New texts on agriscience, horticultural biology, and plant sciences.
10. **What are your hobbies?**
    White water rafting.
11. **What is your most treasured possession?**
    A walking stick made from a tree from Mt. Desert Island, Acadia National Park, Maine.
12. **What do you still have left to learn?**
    So much, so little space, so little time.

Bioethics
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On the basis of these findings, the researcher received a letter of reprimand concluding that he had committed misconduct in science. For a period of three years, he was required to submit a certification that any proposal or report submission was free of misconduct and to obtain assurance from a knowledgeable university official who had reviewed his research records that the submission was accurate and complete. NSF reduced the annual increment of the researcher's award to $65,000 or to an amount commensurate with the program officer's evaluation of his research capabilities and reduced the duration of any award to the researcher to two years or a length of time commensurate with the program officer's evaluation of the researcher's research capabilities.

Three years later, the NSF OIG determined that the researcher had failed to comply with the restrictions specified in the letter of reprimand; he had not been supplying certifications and assurances with his submissions to the agency. Therefore, the agency extended his period of certification and assurance for another three years.

These four cases presented in this column and the prior issue's column are remarkable because they imply that the NSF OIG uncovers only a fraction of the problems that must be ongoing in the public sector and because they indicate that people have an immense capacity to compound their own problems. Whether this blindness is just rationalization (e.g., "I'll never be caught") or reflects true ignorance about ethical behavior is not clear.

Next time: Does gender matter?

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Nothing Green Can Stay

One sunny morning in March, we loaded up our skis and drove into Rocky Mountain National Park on the western side of the Continental Divide, where the Colorado River runs down from its source into the Kawuneeche Valley. At this time of year, the deep snow softens and begins to melt in the warm afternoon sun, each night hardening again to a thick crust. The next day, this hard crust remains until late morning, creating an ideal surface for "crust skiing"; there is no better place on earth for crust skiing than in the long, flat, open meadows of the Kawuneeche Valley. The morning is indelibly etched in our memories. We sailed along on our skate-skis for miles, up and down the valley, against the impressive backdrop of the Never Summer range, the warm sun on our shoulders, the only other souls encountered a family of three coyotes that briefly raced alongside us.

But what we remember most about that morning are the trees. The surrounding mountainsides were thickly forested with evergreens: a variety of fir, spruce, and dense stands of lodgepole pine. They might have been just normal trees in a normal forest, but on this day they seemed unusually, intensely green. At least, that is how we will remember them. It seems unlikely we will ever see them again as they were that day. Just a few miles down the road the drama begins. For more than 100 miles from here, down through Grand Lake and up through the Willow Creek Pass, through North Park and up to the summit of the Cameron Pass, every sweeping vista that stretches out to the distant mountainsides across the valleys and lakes in this entire area now appears to hold mostly dead trees. We are at the height of a massive pine beetle epidemic; according to the Forest Service, in Colorado in 2006 alone nearly 5 million lodgepole pines covering some 650,000 acres were lost. The pine beetles are the worst epidemic in this area at the moment, but spruce beetles are also on the move and are threatening large areas of spruce–fir forests.

In many ways, these beetle outbreaks are a "normal" occurrence. The beetles and the evergeens have coexisted for eons, and epidemics have been documented in the past. However, the current situation might be exacerbated by climate change. Both summers and winters have been warmer over the past few decades compared to historical norms, and the area is experiencing a long-term drought. As a result, the trees are less resistant, and the beetles are not dying off in the winter. They are moving to higher elevations than ever before and attacking many more younger, healthier trees than expected. Of course, death and decay are critical processes that are essential for the long-term health of any ecosystem. Dead trees create vital habitat for myriad other organisms and cycle nutrients and organic matter back to the soil. Perhaps the epidemic will end, and young trees eventually will grow to fill the gaps.

Nevertheless, it is heartrending to see the death of so many trees on such a large scale. The Bowen gulch in this area is exceptional for its dense stands of lodgepole pine and isolated tracts of old-growth spruce—some of the largest spruce trees to be found at this elevation. It is likely that they, too, will succumb within the next few years, if they are not already gone. So on this fine spring day, sun sparkling on white snow, we stop and admire these few remaining splendidly green trees and commit them to our memories.

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Nothing Gold Can Stay

Nature's first green is gold,
Her hardest hue to hold.
Her early leaf's a flower;
But only so an hour.
Then leaf subsides to leaf.
So Eden sank to grief,
So dawn goes down to day.
Nothing gold can stay.

—Robert Frost

Congressmen Hill, Bilbray, Gordon Champion NSF Biology Research

ASPB, Roger Innes Urged Support


Congressman Baron Hill


Congressman Brian Bilbray


Chairman Bart Gordon


ASPB Member Roger Innes

Congressmen Baron Hill (D-IN) and Brian Bilbray (R-CA) and Committee on Science and Technology Chairman Bart Gordon (D-TN) championed support for biological research sponsored by the National Science Foundation in the NSF Authorization Act of 2007 (H.R. 1867) and accompanying House Report 110-114.

The bill authorizes $6.50 billion to be appropriated to the foundation for fiscal year 2008, $6.98 billion for fiscal year 2009, and $7.50 billion for fiscal year 2010. Key language calling for support for biological research sought by Hill, Bilbray, and Gordon was included in the House report accompanying the bill. Following is the report language provision:

"VIII. Committee Views
"Section 3. Authorization of Appropriations
"Research and Related Activities—The Committee supports the proposed increases for the math and physical sciences, computer sciences, and engineering directorates in the fiscal year 2008 request for research and related activities (R&RA). But the Committee also believes it is important to maintain adequate growth over the long term for all fields supported by NSF. Competitiveness depends on advances in biological sciences, physical sciences, mathematics, computer sciences, geosciences, engineering, and the social sciences, as well as the interplay between these fields. The Committee expects future R&RA budgets to include adequate growth for the fields, including social and biological sciences, that saw smaller increases in the FY 2008 request."(from H. R. 110-114)

ASPB Committee on Public Affairs member Roger Innes of Indiana University met with Congressman Hill and his staff on concerns in the biology community with increases in the fiscal year 2008 budget request for NSF that were below the 7.7% average increase across all research disciplines. The increase requested in the 2008 budget for the Biological Sciences Directorate is 4.1%. Social, Behavioral, and Economic Sciences are also below the average increase, at 3.9%, in the 2008 budget request. The language accompanying the authorization calls for future budget increases to include adequate growth for the social and biological sciences in addition to the physical sciences, mathematics, computer sciences, geosciences, and engineering, as well as interdisciplinary research.

Congressman Hill and his office recognized the need Innes mentioned to include biology in the planned 10-year doubling of basic research supported by the committee and NSF and talked with Chairman Gordon's committee staff on the need for the legislative language quoted previously. Congressman Bilbray joined with Congressmen Hill and Gordon in supporting the needed report language. They received bipartisan support for the language from their colleagues on the committee. ASPB staff worked with each of the three offices in support of the language.

Congressmen Hill and Bilbray and Chairman Gordon championed support for biological research with this report language. Increased support for NSF-sponsored biology research would help address the needs of many key biology-based industries in the nation. For example, an April 2005 report of the Departments of Energy and Agriculture found that advances in plant-based bioenergy research would help displace one-third of the foreign oil used in the transportation sector with home-grown and processed biofuels. As a result, $100 billion of the $300 billion a year now spent in the United States for foreign petroleum (in part to nations unfriendly to the United States and its allies) would be spent instead in the United States for domestically produced biofuels. Redirecting $100 billion in consumer energy spending to domestically produced biofuels would help revitalize rural and regional economies in the United States while reducing the nation's trade deficit, strengthening national and world security, and reducing emissions of stored greenhouse gases.

The Committee on Science and Technology approved the report language supporting biology sought by Hill, Bilbray, and Gordon in House Report 110-114 on April 30. The bill with accompanying report was passed by the House May 2. The bill and report can be found at http://thomas.loc.gov/cgi-bin/bdquery/z?d110:h.r.01867.

Stacey Urges 7.7% Boost for NSF in Testimony to House Appropriations Subcommittee

ASPB Committee on Public Affairs Chair Gary Stacey of the University of Missouri testified April 24 on behalf of a 7.7% increase for NSF Research and Related Activities, including for the Biological Sciences Directorate. His testimony was presented in the Capitol before the House Appropriations Subcommittee on Commerce, Justice and Related Agencies chaired by Alan Mollohan (D-WV). Stacey also responded to questions from Chairman Mollohan on completion of his testimony. Following are portions of Stacey's testimony on behalf of ASPB:

Gary Stacey

"Research funding for plant science, in particular, continues to provide important innovations that have led, for example, to the development of a thriving plant biotechnology industry. Innovations have favorably impacted farm production and profits. Research on plants will be crucial to achieving the nation's goals for bio-renewable energy.

"The NSF Directorate for Biological Sciences is the major source of support for fundamental, nonmedical biology research conducted at universities across the nation. The overall grant approval rates within the NSF Directorate for Biological Sciences stands at 21%, which is below the 23% for all NSF directorates. There are individual biology panels with funding rates as low as 8%.

"This funding environment is having a negative impact on the career development of young scientists. In part, tenure decisions at Tier 1 research institutions require that faculty obtain external research funding within the first three years of their appointment. With current funding levels, this has become a very difficult task. Besides the negative impact on the lives of these faculty and their families, the nation is also losing some of its brightest and most creative talent as they fail to develop their research careers.

"There is ample evidence that the federal research investment leads to the creation of jobs and of new industry. It is not an accident that the major areas of development of the semiconductor and biotechnology industry are found close to major universities. High technology industry requires a highly educated workforce and the innovation that federally funded university researchers generate.

"It is clear that continuing the investment of federal funding of research is essential for keeping America competitive in the worldwide innovation race and for generating the new jobs and industries that will grow the workforce."

Amasino Recommends Fiscal Year 2009 Priorities for Biology to White House OSTP

In a May 4 letter to Dr. John Marburger, director of the White House Office of Science and Technology Policy (OSTP), ASPB President Rick Amasino recommended areas of biology as priorities for the 2009 budget. Each year, OSTP circulates, together with the Office of Management and Budget, a research priorities memo to heads of federal research agencies. ASPB Public Affairs staff met May 25 with OSTP Deputy Chief of Staff Dan Byers and OSTP Senior Policy Analyst for the Life Sciences Jane Silverthorne to discuss the research priorities addressed in Amasino's letter. OSTP was collecting information in April and May for consideration for its memo. Following are portions of Amasino's letter to Marburger:

"As you recommended in the memorandum for heads of executive departments and agencies for fiscal year 2008, priority needs to be given to the American Competitiveness Initiative (ACI), energy security, homeland security, understanding complex biological systems, environmental research, advanced networking, high-end computing, and nanotechnology research. . . .

"Biological science, particularly plant science, offers tremendous opportunities in bioenergy research. The Advanced Energy Initiative within the Department of Energy recommended by the president and you

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offers a historic opportunity to reduce dependence on foreign oil. Consumer spending on transportation fuels that goes to U.S.-based bioenergy producers instead of foreign oil suppliers will reap significant benefits for local and regional economies, the nation's balance of trade, the environment, and national security. Increased federal revenues that will result from this shift to domestic energy production can be expected to exceed by a large multiple the amount of the current and projected federal investment in bioenergy research. Cellulose is the most abundant biological material on earth. Cellulosic ethanol plant feedstocks could be selected, designed, and grown on marginal land not used for food crops. Bioenergy research will produce in a cost-effective and sustainable manner ethanol, cellulosic ethanol, biobutanol, biodiesel, and other new biofuels and biochemical products.

"We are encouraged to see the Department of Agriculture proposal for the bioenergy and biobased products research initiative. USDA-supported bioenergy research would complement the Department of Energy bioenergy research initiative.

"Sunlight is the ultimate energy source for the earth. Harnessing even a fraction of this sunlight would provide us sufficient energy for years to come. Plants do this naturally through photosynthesis, an area of research that has garnered support from the DOE Office of Basic Energy Sciences Energy Biosciences program. The burning of fossil fuels releases stored carbon dioxide into the atmosphere, contributing to global warming. Photosynthesis has the ability to recapture carbon dioxide and thus make a carbon-neutral contribution to our energy needs.

"Understanding plant growth and development at a systems level feeds into increasing biomass, as does understanding basic mechanisms of abiotic and biotic stress tolerance. Understanding how cell walls are synthesized and their composition determined not only is fundamental to our knowledge of basic plant biology, but also is a central issue in biomass production and conversion. The same can be said of understanding how plants synthesize and regulate the production of lipids and oils, as well as many other plant constituents and processes.

"During the past decade, there have been significant advances in the mechanistic understanding of how the component elements of terrestrial ecosystems are responding to elements of global change. These include changes in atmospheric carbon dioxide levels, precipitation amount and seasonal distribution, and daily and seasonal temperature cycles. As the primary producers of terrestrial ecosystems, the response of plants to multiple and interactive effects of global change drive the overall ecosystem response. This mechanistic research involving state-of-the-art physiological, biochemical, molecular, and genomic approaches has been almost exclusively conducted on individual plants exposed to global change scenarios under controlled environment conditions. Over the same period, there have been tremendous strides made in the phenomenological characterization of the response of terrestrial ecosystems to interactive effects of global change. Again, this research effort has centered on plants as the drivers of the central ecosystem processes of carbon, nitrogen, and water cycling. Plants also support the major biotic and trophic interactions within ecosystems, and there has been intense interest in characterizing the response of these interactions to global change.

"The emergent research frontier where breakthroughs are most needed is in bridging mechanism and phenomenology to understand the systems biology of a functioning ecosystem under realistic global change treatments. Large-scale manipulative field experiments are critical to advancing these goals. The increasing accessibility of high-throughput genomic, metabolomic, and proteomic tools, when applied to realistic field experiments, will provide the next generation of ecosystem models with greater predictive power. In addition, the discovery of keystone molecular processes that govern the response of ecosystems to global change will extend the general nature of observations made at a limited number of experimental sites. For example, in an ongoing DOE Biological and Environmental Research Program on Ecosystem Research–sponsored study, the application of genomic tools to a field manipulation of atmospheric CO_2 in a soybean agroecosystem revealed the elevated CO_2-dependent downregulation of key genes for hormonal signaling increased the vulnerability to insect pests.

"Applying systems biology in large manipulative field experiments provides the inputs for scaling to the ecosystem-level process that culminates in an overarching framework of mathematical modeling and informatics. The expected result from exploring mechanisms within a functioning ecosystem is more reliable scientific data and models concerning the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels. Results from mechanistically based research conducted under realistic global change conditions will provide one type of important input to help determine recommended safe levels of greenhouse gases in the atmosphere.

"Continued priority on understanding complex biological systems will make possible transformational research advances that will spur technological innovation. This will lead to improved economic competitiveness and job growth. As you noted in last year's guidance, access to new biotechnological tools and increasing amounts of genetic sequence data will open new avenues for research into the functional implications of gene expression. The Plant Genome Research Program and 2010 Project sponsored by the National Science Foundation continue to provide valuable genetic data needed for plant systems biology research.

"Maintaining availability of fresh water supplies is a major challenge of this century. Increased understanding of water efficiency in plant photosynthesis could lead to development of more water efficient plants. This would result in better utilization of existing fresh water supplies. As you noted in the fiscal year 2007 memorandum, U.S. and global supplies of fresh water continue to be critical to human health and economic prosperity."

House Appropriations Increases DOE Office of Science 2008 Budget by 19%

The House Appropriations Committee on June 6 recommended $4.5 billion for the Office of Science for fiscal year 2008, an increase of 18.9%, or $716.8 million, over the current fiscal year.

The committee said in its report that it "is generally pleased with the Department's budget request for the Office of Science in fiscal year 2008. This request for a 15.8% increase is the major incremental increase planned within the overall 10-year doubling of funding for these activities in DOE. A critical element of this increase is the support it will provide for 3,500 more research personnel, including graduate students. This addresses a major concern for the future of the United States economy, namely the availability of highly educated scientists and engineers to support the technical innovations that drive economic growth."

For the Office of Basic Energy Sciences, the Appropriations Committee recommended an increase of 20%, or $248.2 million, over the current fiscal year, which would bring funding for basic energy sciences to $1.5 billion, the same as the budget request. The committee recommendation includes $284.0 million for chemical sciences, geosciences, and energy biosciences.

The House Appropriations Committee recommended $581.9 million, an increase of 20%, or $98.4 million, over this fiscal year for the Office of Biological and Environmental Research (BER). The committee noted that this area of the Office of Science encompasses two distinct research efforts: using biology to address energy production and environmental remediation and combining climate and ecosystem modeling, field research, and radiation monitoring as part of the Climate Change Research Program. Funding is provided in separate subaccounts for these two efforts, and this practice should be used in future fiscal years, the committee said.

The committee recommendation for BER's Biological Research is $423.8 million, an increase of $30.0 million above the budget request. "The increase is provided for the Life Sciences component of Biological Research and is to be used to expand research efforts to develop new strategies for biofuels and sequestration of carbon, both important in addressing climate change. All of the added funds must be awarded competitively in solicitations that include all sources—universities, the private sector, and government laboratories—on an equal basis," the committee said in its report.

"The Committee applauds the use of genomics to address multiple areas associated with energy production including hydrogen and ethanol. The competitive selection of the Genomes to Life Bioenergy Research Centers is a major progressive step, and the Committee hopes that the Department will not confine its research in this area to just a few major centers but will complement these centers with an extensive program of competitive research grants to university, government laboratory and for-profit and not-for-profit private sector researchers," the committee said.

The committee recommendation for climate change research was $158.1 million, an increase of $20.0 million above the budget request.

USDA, DOE Announce $18 Million Bioenergy Research Solicitation

The Department of Agriculture (USDA) and Department of Energy (DOE) have announced a solicitation in which they will provide up to $18 million for fiscal year 2007 to support research and development of biobased products, biofuels, bioenergy, and related processes.

Maximum award amounts will not exceed $1 million. Eligible applicants include state and federal research agencies, national laboratories, private-sector groups, and nonprofit organizations. Consortia of two or more groups are also encouraged to apply. The closing date for preapplications is July 11, 2007, and preapplications must be submitted electronically through Grants.gov at www.grants.gov. Prospective grantees whose preapplications are selected for further processing must submit final applications within 45 days of the notification.

Following is information from a USDA news release issued June 11:

"USDA and DOE are issuing these grant solicitations for several types of projects aimed at increasing the availability of alternative and renewable fuels, which will help further President Bush's bold energy initiatives, including Twenty in Ten. The Twenty in Ten Initiative promotes greater energy security through increased efficiency and diversification of energy sources. USDA will provide up to $14 million and DOE will provide up to $4 million (FY'07).

"'Making these funds available represents this Administration's ongoing commitment to promoting clean energy technologies to help diversify our nation's energy mix in an

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DOE, USDA Award 11 Grants for Biomass Genomics Research

The U.S. Department of Energy's Office of Science, Office of Biological and Environmental Research (OBER), and the U.S. Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service (CSREES), National Research Initiative (NRI), have jointly selected 11 projects for awards totaling $8.3 million for biobased fuels research. These awards continue a commitment begun in 2006 to conduct fundamental research in biomass genomics that will provide the scientific foundation to facilitate and accelerate the use of woody plant tissue for bioenergy and biofuel.

A number of ASPB members received grants awarded from this plant feedstocks genomics program. ASPB continues to be a strong supporter of this program, part of the departments' bioenergy research initiatives.

Link to the June 7, 2007, press release at http://www.csrees.usda.gov/newsroom/news/2007news/doe_biofuels.html and to award winners and grant descriptions at http://genomicsgtl.energy.gov/research/DOEUSDA/index.shtml.

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environmentally sensitive way,' Energy Secretary Samuel Bodman said. 'I am hopeful that these projects will play a critical role in furthering our knowledge of how we can cost-effectively produce more homegrown, biobased products to help reduce our reliance on imported sources of energy.'

"'These grants are one of many steps we are taking to meet the President's goals of reducing petroleum dependency,' Agriculture Secretary Mike Johanns said from South Dakota, where he was addressing the Western Governors' Association. 'They will fund essential research that not only will lead to the creation of new, sustainable energy sources, but also will create new uses and markets for agricultural products.'

"The $18 million solicitation will fund projects in the following four categories (the share of overall funding is noted in parentheses): the development of technologies to convert cellulosic biomass into intermediaries for biobased fuels (45%), product diversification (30%), feedstock production (20%), and analysis for strategic guidance (5%).

"Johanns cited how research and development (R&D) efforts outlined in past grant awards could develop technology that supports the goals of the President's Twenty in Ten Initiative. In Indiana and Illinois, researchers from both the public and private sectors are working to improve dry mill fractionation. The goal is to increase ethanol production from corn and, as a by-product of that, to produce protein additives for cattle feed. It is anticipated that ethanol production estimates could increase significantly if this research is successful and implemented within the dry mill fractionation process. When this technology is implemented, energy savings annually are estimated at about 1,500 billion BTUs per dry mill. In addition, penetration at a level of 70% of the dry mills with this technology could produce an additional 1.2 billion gallons of ethanol from corn and an additional production of 130 million barrels of biodiesel.

"Reducing our reliance on imported sources of energy is one of President Bush's top priorities. In an effort to break our addiction to oil, the President's Farm Bill proposal includes $1.6 billion in new renewable energy funding for USDA. It seeks $500 million over 10 years to expand the Renewable Energy and Energy Efficiency Program, $500 million for bioenergy and biobased research, and $210 million to support $2.1 billion in loan guarantees for energy efficiency measures, with a significant focus on cellulosic ethanol. Since 2002, USDA has awarded $58.1 million in grants to 55 projects in 27 states and the District of Columbia under the Biomass Research and Development Initiative. Since the beginning of 2007, DOE has announced nearly $1 billion in funding for biofuels R&D."

Information on these grant solicitations was posted on the ASPB website and sent to ASPB Campus Contacts in mid-June. For more information, visit www.grants.gov, USDA/DOE Solicitation. For more information on President Bush's Twenty in Ten Initiative, visit http://www.whitehouse.gov/stateoftheunion/2007/initiatives/energy.html.

Biofuel Crops Curb Release of Stored Greenhouse Gases

Corn and soybeans may be the current go-to crops for producing ethanol and biodiesel, respectively. But two other crops—switchgrass and hybrid poplar—could steal the show in the future when it comes to curbing greenhouse gases, according to Agricultural Research Service (ARS) and collaborating scientists.

In a study published in the April issue of *Ecological Applications,* ARS scientist Paul Adler and colleagues compared the net production of carbon dioxide and two other greenhouse gases associated with producing biofuels from several different bioenergy crops.

In short, it takes energy to produce energy, notes Adler, who's in the ARS Pasture Systems and Watershed Management Research Unit, University Park, Pennsylvania. For example, operating a tractor to plow, plant, fertilize, and harvest requires gasoline or diesel fuel. This, in turn, releases carbon dioxide and other greenhouse gases tied to global climate change.

The good news? Bioenergy crops offset their greenhouse gas contributions in three key ways: by removing carbon dioxide from the air and storing it in crop roots and soil as organic carbon; by producing coproducts, like protein for animal feed, which saves on energy to make feed by other means; and by displacement, whereby replacing a fossil fuel with a biobased one "recycles" rather than adds more carbon dioxide to the atmosphere.

Together with ARS scientist Stephen Del Grosso of Fort Collins, Colorado, and William Parton of Colorado State University, Adler predicted a 40% reduction of greenhouse gas emissions if ethanol and biodiesel from corn–soybean rotations were used instead of gasoline and diesel. This reduction was about two times greater than using ethanol produced from corn grain alone. However, the team predicted that using switchgrass and hybrid poplar would produce nearly a threefold greater reduction in greenhouse gas emissions compared to corn–soybean rotations.

This research shows that biofuels do indeed have potential to remove greenhouse gases from the atmosphere while helping reduce U.S. reliance on foreign oil, according to Adler. This information was taken from an ARS news release issued June 8.

Barry Bruce One of "10 People Who Could Change the World," *Forbes* Reports

Bruce Explains His Research to Congressional Offices

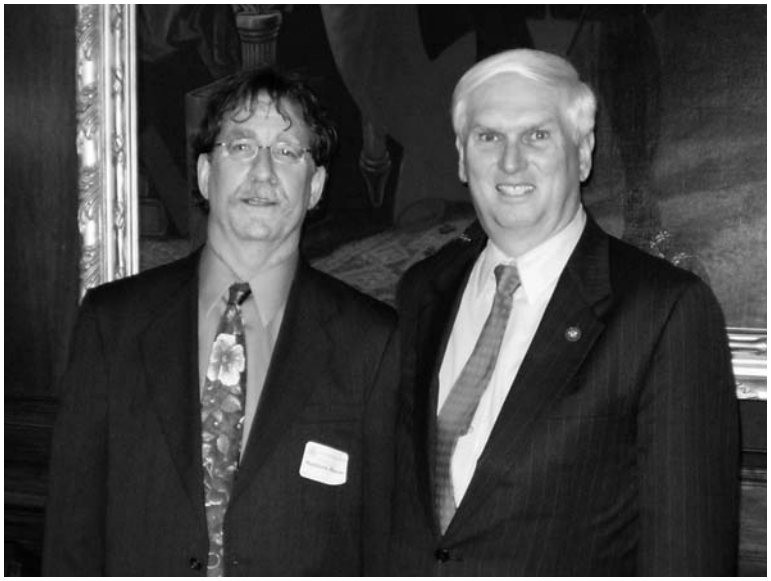
Business magazine *Forbes* reported May 24 that ASPB member Barry Bruce, of the University of Tennessee, has made a revolutionary discovery that distinguishes him as one of "10 people who could change the world."

Forbes reported, "Bruce and his colleagues poach particles from photosynthetic plants or bacteria and form them into so-called 'nanoclusters' on small assemblages of metallic platinum. These photosystems produce very high-energy electrons that can be siphoned off for direct electrical power or used to stimulate the production of hydrogen atoms, usable as fuel in anything from cars to homes.

"The system is far preferable to conventional photovoltaic solar power systems, because it doesn't require the complex manufacturing process of solar cells, which uses a number of toxic and limited materials. And since the photosynthetic particles are easily harvested—Bruce extracts them from garden-variety spinach using a standard kitchen food processor—it should be a lot cheaper," the *Forbes* article continued.

The article noted that this approach is also more sustainable than most other energy production systems. Forbes labeled Bruce a "revolutionary" for this discovery, in which he is "growing electricity."

The *Forbes* story is available at http://www.forbes.com/2007/05/23/innovation-world-changing-tech-cx_07rev_ee_0524worldchangers.html.



Congressman John Duncan (right) met with Barry Bruce in the Rayburn Room of the Capitol.

Bruce and ASPB Public Affairs staff visited April 19 with congressional offices in the Tennessee delegation. Bruce explained to congressional staff his research on growing electricity, which is supported by the National Science Foundation (NSF). He also discussed other research projects he is conducting. He urged support for research supported by the NSF, USDA, and DOE.

Bruce met with Congressman John Duncan (R-TN) and his staff; with Committee on Science and Technology Chairman Bart Gordon's (D-TN) committee staff and personal office science staff; with Senator Lamar Alexander's (R-TN) committee staff; and with Senator Bob Corker's (R-TN) personal office science staff. On April 18, Bruce and ASPB Public Affairs staff listened to presentations from NSF officials—Biological Sciences Directorate Assistant Director James Collins; USDA–CSREES Competitive Programs Deputy Administrator Anna Palmisano; and White House Office of Science and Technology Policy Senior Policy Analyst for the Life Sciences Jane Silverthorne—as part of the BESC/CoFARM biological and agricultural science society coalition program.

ASPB Members Wang, Torney Use Nanotechnology to Penetrate Plant Cell Walls

Iowa State University scientists have demonstrated the first use of nanotechnology to enter plant cells. A team of Iowa State plant scientists and materials chemists have successfully used nanotechnology to penetrate plant cell walls and simultaneously deliver a gene and a chemical that triggers its expression with controlled precision. Their breakthrough brings nanotechnology to plant biology and agricultural biotechnology, creating a powerful new tool for targeted delivery into plant cells, according to a news release May 16 from Iowa State University.

The research, "Mesoporous Silica Nanoparticles Deliver DNA and Chemicals into Plants," is a highlighted article in the May issue of *Nature Nanotechnology.* The scientists are Kan Wang, professor of agronomy and director of the Center for Plant Transformation, Plant Sciences Institute; Victor Lin, professor of chemistry and senior scientist, U.S. Department of Energy's Ames Laboratory; Brian Trewyn, assistant scientist in chemistry; and Francois Torney, formerly a postdoctoral scientist in the Center for Plant Transformation and now a scientist with Biogemma, Clermond-Ferrand, France.

Currently, scientists can successfully introduce a gene into a plant cell. In a separate process, chemicals are used to activate the gene's function. The process is imprecise, and the chemicals could be toxic to the plant.

"With the mesoporous nanoparticles, we can deliver two biogenic species at the same time," Wang said. "We can bring in a gene and induce it in a controlled manner at the same time and at the same location. That's never been done before."

The controlled release will improve the ability to study gene function in plants. And in the future, scientists could use the new technology to deliver imaging agents or chemicals inside cell walls, providing plant biologists with a window into intracellular events.

The Iowa State team, which has been working on the research in plants for less than three years, started with an Iowa State University proprietary technology developed previously by Lin's research group. It is a porous, silica nanoparticle system. Spherical in shape, the particles have arrays of independent porous channels. The channels form a honeycomb-like structure that can be filled with chemicals or molecules. "One gram of this kind of material can have a total surface area of a football field, making it possible to carry a large payload," Trewyn said.

Lin's nanoparticle has a unique capping strategy that seals the chemical goods inside. In previous studies, his group successfully demonstrated that the caps can be chemically activated to pop open and release the cargo of animal cells. This unique feature provides total control for timing the delivery. "The tremendous advantage is that you can deliver several things into a plant cell at the same time and release them whenever you want," Torney said.

"Until now, you were at nature's mercy when you delivered a gene into a cell," Lin said. "There's been no precise control as to whether the cells will actually incorporate the gene and express the consequent protein. With this technology, we may be able to control the whole sequence in the future."

And once you get inside the plant cell wall, it opens up "whole new possibilities," Wang said. "We really don't know what's going on inside the cell. We're on the outside looking in. This gets us inside where we can study the biology per se," Wang said.

The interdisciplinary research collaboration was funded and facilitated by Iowa State's Plant Sciences Institute. The institute sponsors Wang's work to develop a male-sterile, biopharmaceutical corn—the corn contains a therapeutic protein but does not produce pollen. The materials development and synthesis of the nanoparticles in Lin's laboratory was funded by the energy department and the National Science Foundation. Wang and Lin intend to continue their collaboration to further develop the technology and its applications in plants.

Important Dates in 2007

July 5–7
Laboratory Leadership Workshop, Chicago, Illinois
http://www.aspb.org/meetings/pb-2007/labmanagement.cfm

July 7–11
Plant Biology & Botany 2007 Joint Congress, Chicago, Illinois
http://www.aspb.org/meetings/pb-2007/index.cfm

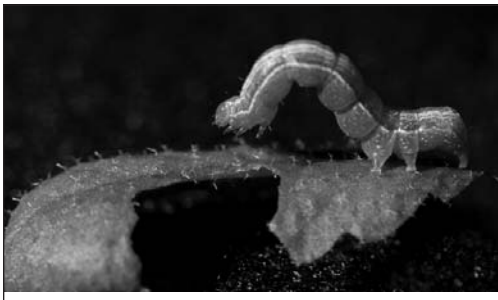
September
(date to be determined)
Mid-Atlantic Section Crab Feast, ASPB Headquarters, Rockville, Maryland
http://www.aspb.org/sections/ washington/meetings.cfm

Katie Engen

Katie Engen has joined the ASPB staff as the new Education Foundation assistant. She previously worked as a teacher and freelance writer.

A native of Pennsylvania, Katie was transplanted to Maryland as a child. She attended the University of Virginia, where she earned her master's degree in education. She also taught in Los Angeles, where she acquired various other teaching certifications. Since returning to Maryland in 1993, she has taught in public and private schools, developed school curricula, and created educational materials for school publishers and children's science and history magazines. In addition to her work at ASPB, she continues to teach and write.

Katie lives in Kensington, Md., with her husband and two daughters. The family spends countless hours practicing and playing a wide variety of sports.



CALL FOR PAPERS

Plant Physiology Focus Issue on Plant Interactions with Arthropod Herbivores

Plant Physiology is pleased to announce a Focus Issue on Plant Interactions with Arthropod Herbivores to be published in March 2008. The issue will be edited by Georg Jander and Gregg Howe. Submissions describing novel aspects of any interaction between plants and arthropod herbivores are welcome. Emphasis should be on molecular and biochemical aspects of the interaction, including recognition of herbivory, signaling pathways that regulate host plant defense, volatile signals, tritrophic interactions, plant defense chemistry, manipulation of plant defenses by herbivores, and natural variation in plant resistance to herbivores.

Authors interested in contributing should indicate this in the cover letter when submitting papers online at http://submit.plantphysiol.org/. Please select "Plant-Herbivore Interactions, March 2008" from the Focus Issue list in the online submission system. Articles published within 2 years before and after the Focus Issue will be considered for inclusion in an online Focus Collection of articles relevant to the focus topic.

Please contact Georg Jander (gj32@cornell.edu) or Gregg Howe (howeg@msu.edu) for additional information.

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

ASPB Undergraduate Fellowships

Fifteen students mentored by ASPB members were selected to receive ASPB Summer Undergraduate Research Fellowships (SURFs) for 2007. Each $3,000 fellowship will permit a student to devote full-time effort to his or her research project for a 10-week period this coming summer. The award also includes $500 to the mentor for lab supplies, a free student membership in ASPB until August 2008, and travel grant assistance to attend the 2008 ASPB Plant Biology meeting.

This is the seventh year of the SURF program. In previous years, the program supported eight students, but this summer funding was increased to support 15 students. There were 24 Category A (research and doctoral universities) applicants and 10 Category B (master's universities, baccalaureate colleges, and associate of arts colleges) applicants, for a total of 34 highly competitive projects. The reviewers were impressed by the high quality of all the applicants' projects and the commitment of the students and their mentors to their ongoing research.

The SURF program was once again cochaired by **Mark Brodl,** Trinity University, and **Jon Monroe,** James Madison University, and also cochairing this year was **Amy Clore,** New College of Florida. Mark Brodl and Jon Monroe, who started the program, expressed their appreciation to the ASPB Executive Committee for providing ASPB Good Works funds to support the fellowship program and to the reviewers, who contributed many hours in selecting the recipients. Complete project descriptions can be viewed on the ASPB website at http://www.aspb.org/education/undergrad/cfm.

The committee hopes that this award will enable these students to strengthen their interests and skills in plant biology research and to gain the satisfaction that comes from asking and answering difficult questions. ASPB mentors should check the APSB home page starting in December 2007 for the next SURF announcement. E-mail announcements of SURF opportunities are sent to all members.

Summer Undergraduate Research Fellowship 2007 Recipients

CATEGORY A

Research and Doctoral Universities

Christopher Aakre, Stanford University
Project: *Biological Function of the Tomato LRR–RLK in* Xanthomonas*–Host Interactions*
Mentor: Dr. Mary Beth Mudgett

I am incredibly excited to be working under the sponsorship of ASPB this coming summer. The SURF will allow me to focus in depth on a problem that particularly interests me—that is, how plant pathogens use effector proteins to colonize their hosts and promote disease. I am extremely grateful to my mentor, Dr. Mary Beth Mudgett, and to everyone else in the lab for their encouragement and support.

Robert Billmyre, University of Maryland, College Park
Project: *Auxin Transport in Charophytes: Examining the Roots of Land Plant Evolution*
Mentor: Dr. Heven Sze

I am excited to be able to continue my research this summer, thanks to the generous aid of ASPB. This award will enable me to devote my full energy to my research for the first time in my college experience, and for that I am extremely grateful. I would also like to thank Dr. Heven Sze and Dr. Todd Cooke, at the University of Maryland, for their help throughout my project.

Lihan Deng, University of Tennessee, Knoxville
Project: *Study of the Function of EPIP1 and EPIP2 Proteins*
Mentor: Dr. Elena Shpak

I thank ASPB for this honored award. This is a great acknowledgment for me and a wonderful opportunity to continue my research in plants, where my greatest interest lies. I can't wait to get started, and I am looking forward to the ASPB meeting to meet other plant biologists. I also thank my mentor, Dr. Elena Shpak, for her support and guidance.

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CATEGORY A Research and Doctoral Universities (continued from page 25)

Christine Falaschetti, Loyola University, Chicago
Project: *Regulation of Starch Synthesis in Wheat: The Unique Endosperm ADP-GlcPPase*
Mentor: Dr. Miguel Ballicora

I cannot begin to express how overjoyed I am at receiving such a prestigious honor from ASPB. I extend many thanks to ASPB for awarding me this very generous opportunity. Without the encouragement and guidance of my research mentor, Dr. Miguel Ballicora, and the very talented individuals in his lab, I would never have imagined this possible. The fellowship will allow me to expand my love of scientific research and narrow my focus for graduate school. Finally, I look forward to meeting and learning from students and professors who share similar interests in plant biology at the conference in Mérida next year.

Ashley Hipps, Cornell University
Project: *Determining the Molecular Mechanisms of Temperature Modulation of Defense Responses in* Arabidopsis thaliana *Through* int *Mutants*
Mentor: Dr. Jian Hua

I am very grateful to ASPB for granting me the SURF award, and I'm looking forward to an exciting summer of research. This is an excellent opportunity for me to become more involved in biological research at Cornell. I thank my mentor, Dr. Jian Hua, for her guidance and encouragement and Dr. Beth Krizek for first introducing me to plant research last summer.

Charles Mason, Pennsylvania State University
Project: *Heterologous Biosynthesis of Flavonoid Metabolites and Characterization of Induction Properties of a Transcription Factor in Fungal Challenged Maize Plants*
Mentor: Dr. Surinder Chopra

It is an honor to be one of the recipients of the 2007 ASPB SURFs. I plan on making the most of my learning experience this summer. I thank ASPB for the opportunity to expand my horizons on a subject I love to study. I also thank my mentor, Dr. Surinder Chopra, Farag Ibraheem of the Maize Genetics Lab, and the faculty members of the agroecology curriculum for their guidance and support in all of my endeavors.

Ryan Mayle, Michigan State University
Project: *cpDNA Mutations as a Genetic Indicator of Oxidative Damage in* Chlamydomonas reinhardtii *Under High Light Conditions*
Mentor: Dr. Barb Sears

I thank ASPB for this great opportunity. I really look forward to a fun and productive summer doing research. The fellowship is an awesome thing for me, and I am very grateful to ASPB for assisting me in my desire to explore the details of chloroplast genetics. I also thank my mentor, Dr. Barb Sears, for her support.

Amy Rymaszewski, University of Wisconsin–Milwaukee
Project: *Identification of Novel Signaling Components in the EMS1 Signal Transduction Pathway Using Activation Tagging*
Mentor: Dr. Dazhong Zhao

I was completely shocked that I was awarded a 2007 SURF. My first response was, "Holy Photosynthesis!" I thank ASPB for awarding me the fellowship. This is a wonderful opportunity to advance my career in plant genetics and have a greater understanding of a subject I am passionate about. The knowledge I will gain from this experience is something that will stay with me for a lifetime and benefit me greatly. I especially thank my professor Dr. "Dave" Zhao for helping me throughout this experience. He has been the most amazing mentor; Dave shares the knowledge he possesses and makes learning a fun experience.

Christian Santa Maria, University of California, Davis
Project: *Sister Chromatid Cohesion in Plants: Comparing Centromeres to Chromosome Arms*
Mentor: Dr. Simon Chan

I am deeply honored and thrilled to be a recipient of the ASPB SURF award. I express my most profound gratitude to ASPB for presenting me with this privilege and to my mentor, Dr. Simon Chan, for allowing me to work with him and his team. I also thank my parents, Davey and Glenda, and my two younger sisters, Christine and Abbey, for their constant love, guidance, and encouragement. I anticipate that this will be a valuable learning experience for me as I conduct relevant scientific research and advance my understanding of the field in preparation for graduate school. I am very excited about this summer, and I look forward to presenting our findings at next year's ASPB conference.

Amy Schroeder, Truman State University
Project: *Roles of Conserved Serine and Tyrosine Residues in the Active Site of Tyrosine Ammonia-Lyase*
Mentor: Dr. Joseph Jez

I am incredibly grateful to be awarded a SURF grant for summer 2007 from ASPB. I am looking forward to expanding my knowledge and experiences in plant biology while also continuing my research. I thank ASPB for awarding me with this fantastic opportunity. I also extend my thanks and appreciation to my mentor, Dr. Joseph Jez, and everyone involved with the Jez lab. They have guided me in countless ways to become a more experienced plant biologist.

Blaire J. Steinwand, Colorado State University
Project: *Sucrose Induced Expression of the PAP1 Gene in* Arabidopsis thaliana
Mentor: Dr. Dan Bush

It is an honor to be selected as a recipient of a SURF award for the summer of 2007. As an aspiring scientist, I am very excited about the opportunity to make progress in my research and further my understanding of the many aspects of plant biology over the course of the summer. I thank ASPB for this award and my mentor, Dr. Dan Bush, together with Bettina Deavours and others from the Bush lab, for all their support and teaching along the way.

continued on next page

CATEGORY B Master's Universities, Baccalaureate Colleges, and Associate of Arts Colleges (continued from page 27)

Roxana Godiwalla, University of Wisconsin–Whitewater
Project: *Effects of Calcium on the Growth of Various Mutant Plants*
Mentor: Dr. Catherine Chan

It is a great a honor and privilege to be awarded a SURF from ASPB! Being provided with such an opportunity, I can continue my growth as a student and researcher. It is with these great opportunities that individuals develop into more refined researchers. I look forward to the rewards and knowledge of continuing research this summer with my mentor. Special thanks to Dr. Catherine Chan and colleagues in the Chan lab.

Tazley Hotz, East Tennessee State University
Project: *Salicylic Acid–Methyl Transferase Required for Plant Innate Immunity*
Mentor: Dr. Dhirendra Kumar

I thank ASPB for awarding me a SURF for the summer of 2007. This is a wonderful opportunity for me and will be invaluable to my education and future pursuits. I also thank my mentor, Dr. Dhirendra Kumar, for giving me the chance to be a part of his lab. I am looking forward to continuing my research this summer and presenting my work at the 2008 conference.

Janelle Johnson, San Francisco State University
Project: *WAKL4 Cis-Acting Elements in Response to Environmental Minerals*
Mentor: Dr. Zheng-Hui He

Receiving the SURF from ASPB could not have come at a better time in my life. I have been working hard in school, so having this opportunity to focus on my research with Dr. Zheng-Hui He during the summer is priceless. I am very thankful for the chance to improve my research abilities as a molecular plant biologist. I would not be where I am if it was not for the encouragement of my family and professors, who believed in me.

Stacy Kowsz, Rochester Institute of Technology
Project: *Quorum Sensing Signal Mimics in Modern and Ancient Corn Types*
Mentor: Dr. Michael Savka

It is such an honor to receive a SURF from ASPB, which will allow me an excellent opportunity to plan and carry out research over the summer. I am looking forward to conducting the research project that I proposed, and I am very grateful for the funding provided by ASPB. I also thank my mentor, Dr. Michael Savka, for his efforts and guidance. I excitedly anticipate the summer, as well as the opportunity to attend the ASPB meeting during the summer of 2008.

Four Times the Fun at the ASPB Booth!

The ASPB Education Booth at the 2007 American Association for the Advancement of Science (AAAS) Family Science Days in San Francisco February 17–18 was an outstanding success. About 2,000 visitors enjoyed the booth over a very busy two days. The booth consisted of four dynamic stations, each attracting a slightly different subset of the audience.

At the first station, entire families drew close to watch the s*L*owlife video, created by Education Foundation board member Roger Hangarter of Indiana University. Parents and children alike were fascinated by this beautiful video, and many were eager to discuss the captivating plant movements caught on screen.

The Tic, Tac, Grow board game, designed by Education Foundation board member Peggy Lemaux of the University of California at Berkeley attracted droves of kids to the second section. Tic, Tac, Grow teaches K–7 educators and students about what plants look like and how important they are to the way we live. This fun, enlightening game was in constant use throughout both exhibit days. Visitors to this station also received plant science trading cards, designed by Barbara Alonso at Berkeley. Each of these five dynamically designed cards highlights an important concept about plant genetics.

The third station exhibited Peggy Lemaux's GMO Food Display. This station intrigued adults, especially parents. They had many thoughtful questions about food supply, development, health, and nutrition.

The ASPB handouts from the fourth station were a big hit with everyone. Kids snatched up the ASPB logo sunglasses and water bottles. After getting their freebies, kids and their parents tended to linger at the booth, asking questions and soaking up a lot of great information. Teachers happily gathered inspiring plant science posters and bookmarks for their classrooms and spent time learning to navigate the ASPB website so that they could obtain additional plant education materials later.

Plant science is great family fun! Xander Jones (far right) helps out at the Tic, Tac, Grow game board.

You're never too young to be a plant biologist!


Luke Edison Coker was born on December 11, 2006, to Beth and Jeffrey Coker. His timing was perfect for helping his dad plan the AAAS Family Science Days exhibit.

The Education Booth was so productive because of the hard work and enthusiasm of those who volunteered their time and expertise to meet with the booth's visitors. The engaging team of experts included Jim Tepperman, Jenne Stonaker, Tracy Powell, Xander Jones, Russell Scott, and Amber Kerr. Barbara Alonso helped with booth setup. ASPB members Rajnish Khanna and Katie Krolikowski, both of Mendel Biotechnology, staffed the booth nearly the entire time on both days. They were invaluable contributors—working every station, promoting plant education, and talking to families about local science opportunities for kids.

ASPB Education Committee member Jeffrey Coker of Elon University explained that coordinating the booth is a pleasure, because he gets to promote plant biology to a very diverse crowd. Jeffrey also spoke with several members of the press from the United States and Europe, who were quite impressed by ASPB's education and outreach efforts. Coker and Education Committee Chair Mary Williams expressed appreciation to the ASPB Executive Committee for providing Good Works funds to support the ASPB exhibit at AAAS Family Science Days.

Thanks to the knowledge and enthusiasm of these volunteers, the Society's initiative to promote plant science as an effective gateway to inquiry and learning within families and in the K–12 classroom was fruitfully disseminated to a new crop of interested learners.

Gilbert Gude

Gilbert Gude, philanthropist, environmentalist, and Republican legislator, died June 7, 2007 of congestive heart failure at Sibley Memorial Hospital in Washington, D.C. He was 84. Survivors include Mrs. Jane Callaghan Gude, their five children, and three grandchildren (1).

Mr. Gude (pronounced GOO-dee) is of special importance to ASPB because in 1981 he and his family donated their family property in Rockville, Md., to be converted to the Society's headquarters.

Gilbert Gude was born March 9, 1923. He was raised on the Rockville property, where his father ran a very successful nursery. He graduated from Woodrow Wilson High School in Washington, D.C. and he attended the University of Maryland. His schooling was interrupted from 1943 to 1946 by World War II, when he served with the U.S. Army Medical Department in the Pacific theater of operations.

After the war, Gude earned a bachelor's of science in horticulture from Cornell University in 1948. He worked with his father and siblings at the family nursery until he was appointed to the Maryland House of Delegates in 1955. He was re-elected to that office until 1958. In 1958, he was voted into the Maryland State Senate, where he served from 1962 until he was elected to Congress in 1967. He held office for five consecutive terms as Maryland's Republican representative until 1977 (2).

Gude's liberal Republican values spurred his many legislative activities. Within the city, Gude advocated for home rule in Washington, D.C. He also worked to initiate the building of the Washington metropolitan area's subway system.

Perhaps Gude was most proud of his success in saving the historical C&O Canal, which runs 185 miles from the heart of Washington D.C. to Cumberland, Md. His sponsorship halted the construction of a highway that would have paralleled and eventually eclipsed the 19th-century canal. His continued legislative efforts catalyzed the restoration of the canal as well as the creation of the Chesapeake & Ohio Canal National Park in 1971. Over the next several years, Gude led at least one extensive hiking, biking, canoeing, and horseback riding tour of the Potomac River valley he so enjoyed.

Gilbert Gude. Photograph by Margaret Thomas/The Washington Post.

Gude looked far beyond his hometown. His amendment to the Clean Air Act of 1970 required that auto emission tests be published annually. He also introduced standards to improve air quality in Washington, D.C. and to limit airport-based noise pollution. In 1971, he sponsored the Wild Free-Roaming Horse and Burro Act to protect wild mustangs that were being hunted for dog food in the West.

Gude was named congressional observer at the United Nations Conference on the Human Environment in Stockholm, Sweden, in 1972. He continued his political career until his surprising retirement from public duty in 1977. He claimed to want to lead a more balanced life, yet he maintained a phone line in his home so his past constituents could continue to reach him. From 1977 to 1985, Gude was the Library of Congress's director of congressional research.

Also during these years, the Gude family prepared to relocate from their Rockville property. In 1981, Gude completed his father's preliminary plans and donated the family's five acres with nursery, private home, and barn to the American Society of Plant Physiologists (3). (Years later, ASPP subsequently changed its name to the American Society of Plant Biologists.) The Society transformed the property into its national headquarters. For a more in-depth study of the Gude family's connections to ASPB, please consult the *History of the American Society of Plant Physiologists* by Jack Hanson. See also the online version of the book at http://www/aspb.org/aboutus/ history/cfm (download the Chapter 5 pdf and search on "Gude" or just jump to page 203).

The Gudes moved to a new home in Bethesda, Md. Gude remained busy after retiring from full-time work in 1986. He taught history and environment courses at Georgetown University, and he wrote three books: *Small Town Destiny: The Story of Five Small Towns Along the Potomac Valley; Where the Potomac Begins: A History of the North Branch Valley;* and *What Should Be the Level of U.S. Commitments for National Defense?* Mr. and Mrs. Gude both moved to an assisted living facility near Sibley Hospital several weeks ago.

Today, ASPB headquarters still resides on the skillfully landscaped Gude property. The commercial nursery is long gone, but the charming home provides an office for the Society's staff and meeting facilities for ASPB member committees. Clearly, the Society has benefited greatly from the generosity of Gilbert Gude and his family.

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