ASPB News

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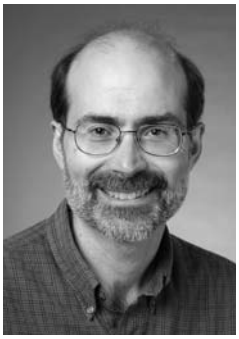
Energy and Plant Biology



Rick Amasino

The recent release of the report on the economics of climate change commissioned by the British government ([1]; often referred to as the Stern Review) underscores the urgency of addressing the issue of human-caused increasing atmospheric CO_2 concentration. Before the industrial revolution, CO_2 levels were 280 ppm; the current level is over 400 ppm. The Stern Review (and *many* other reviews) note that if we continue on our present course, the CO_2 equivalent levels (2) could approach 600 ppm by 2035 and that if CO_2 equivalent levels are not stabilized at the 450–550 ppm level, the consequences could be quite severe (for a review of those consequences, see the Stern Review or an apocalyptic 2003 report [3] prepared for the Pentagon). Furthermore, if we do not act now, the opportunity to stabilize at even 550 ppm is likely to "slip away" (1). Long-term stabilization will require that CO_2 emissions ultimately be reduced "to more than 80% below current levels" (1); such a reduction will require major changes in how we operate.

A major focus of the Stern Review is economics. (A concise and interesting perspective on climate change and economics was recently written by Joseph Stiglitz, an economist who won the Nobel prize in 2001 [4].) The Stern Review notes that the implementation of measures to achieve the reductions required for stabilization are a "major challenge," but, if we act quickly, stabilization can be achieved "at costs that are low in comparison to the risks of inaction." One of the reasons there has not been much progress to date is that "climate change is the greatest market failure the world has ever seen" (1). *Market failure* refers to the failure to pay the long-term costs of releasing CO_2. Indeed, with the exception of Boulder, Colorado, whose citizens recently approved a carbon tax (5), there are no costs in the United States for using the atmosphere as a waste dump for CO_2. The atmosphere is being used as a "commons" in the sense discussed by Hardin in the essay "The Tragedy of the Commons" (6). This market failure is not surprising: Markets are driven solely by economic factors, and unless markets are required to incorporate long-term global costs, they will not do so. There are signs of change; for example, in a case now before the Supreme Court, 12 states are suing the Environmental Protection Agency for not regulating CO_2 emissions (7).

Plants are, of course, a carbon-neutral source of energy that could make a contribution to atmospheric stabilization. But we need to be realistic with respect to the contributions that certain plant-based approaches can provide. For example, if the entire U.S. crop of corn grain was converted into ethanol, it would meet approximately 15 percent of our current transportation fuel needs (8). And despite Willie Nelson's enthusiasm (9), our entire vegetable oil crop would provide much less fuel than corn grain. Clearly, if the United States had not retreated from policies that mandated and encouraged conservation, we

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

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Deadline for May/June 2007
ASPB News: April 5, 2007

Correction for *ASPB News* 33(6): 4

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Terrence Delaney (09)

ASPB Officers & Staff

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Copy deadline is the 5th day of the preceding even-numbered month (for example, December 5 for January/February publication). Submit copy by e-mail whenever possible; submit all other copy by mail, ***not by fax.***

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	B0904-5-ASPB	5 g	$31.00
	B0904-25-ASPB	25 g	$119.00
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	C0109-25-ASPB	25 g	$219.00
Cefotaxime	C0111-1-ASPB	1 g	$29.00
	C0111-5-ASPB	5 g	$87.00
	C0111-25-ASPB	25 g	$393.00
Chloramphenicol	C0113-25-ASPB	25 g	$26.00
	C0113-100-ASPB	100 g	$64.00
Kanamycin	K0126-1-ASPB	1 g	$8.00
	K0126-5-ASPB	5 g	$28.00
	K0126-10-ASPB	10 g	$51.00
	K0126-25-ASPB	25 g	$94.00
MUG	MUG200-ASPB	200 mg	$22.00
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	S0188-25-ASPB	25 g	$92.00
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	T0916-500-ASPB	500 mg	$159.00
	T0916-1-ASPB	1 g	$269.00
Ticarcillin/Clavulanate	T0190-2-ASPB	2 g	$38.00
	T0190-10-ASPB	10 g	$159.00
	T0190-25-ASPB	25 g	$379.00
Vancomycin	V0155-1-ASPB	1 g	$59.00
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President's Letter
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might currently be saving more fuel than that which could be produced with existing technologies from our current total corn and vegetable oil outputs.

As ASPB members know, the most abundant source of plant-derived energy is where most of the fixed carbon is deposited—the cell wall. A recent report from the Department of Energy, "Breaking the Biological Barriers to Cellulosic Ethanol" (8), provides a quantitative assessment of the significant contribution that cell wall biomass could make to our energy budget. A key issue discussed in the report is whether efficient technologies can be developed to convert cell wall material into fuels. Progress is likely to result from a combination of plant breeding, plant and microbial metabolic engineering, and chemical engineering. On the plant side of the equation, for example, a promising approach is the development of ways to modify cell wall composition to create a "feedstock" that is more readily converted into fuels. Of course, stabilization of CO_2 levels will require progress on multiple fronts. When there are breakthroughs in the conversion of cell wall biomass to fuels, a combination of conservation and increased utilization of other renewable energy sources, such as wind, photovoltaics, and solar heating, to name but a few, will also be required.

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REFERENCES

1. The Stern Review can be obtained at http://www.sternreview.org.uk. The Executive Summary of the Stern Review provides a concise overview: http://www.hm-treasury.gov.uk/media/8AC/F7/Executive_Summary.pdf.
2. *CO_2 equivalent level* refers to the radiative effects of a certain level of CO_2; for example, the effects of other heat-trapping atmospheric gases such as methane can be expressed as CO_2 equivalents.
3. Article on the report at http://observer.guardian.co.uk/international/story/0,6903,1153513,00.html; actual report at http://www.environmentaldefense.org/documents/3566_AbruptClimateChange.pdf.
4. Joseph Stiglitz. (2006). A new agenda for global warming. *The Economists' Voice* 3(7): Article 3. http://www.bepress.com/ev/vol3/iss7/art3/. (The Nobel prize in economics is formally the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.)
5. Katie Kelley. (2006). City approves "carbon tax" in effort to reduce gas emissions. *New York Times,* November 18. http://www.nytimes.com/2006/11/18/us/18carbon.html?th&emc=th.
6. Garrett Hardin. (1968). The tragedy of the commons. *Science* 162: 1243–1248. DOI: 10.1126/science.162.3859.1243; http://www.sciencemag.org/cgi/content/full/162/3859/1243.
7. Juliet Eilperin. (2006). High court to hear greenhouse gas case. *Washington Post,* June 27, A05. http://www.washingtonpost.com/wp-dyn/content/article/2006/06/26/AR2006062600399.html.

   Global warming goes to court (Editorial). (2006). *New York Times,* November 28. http://www.nytimes.com/2006/11/28/opinion/28tue1.html?th&emc=th.
8. Breaking the biological barriers to cellulosic ethanol. http://genomicsgtl.energy.gov/biofuels/b2bworkshop.shtml.
9. Willie Nelson's Biodeisel website: http://www.wnbiodiesel.com/.

Note added in proof: The Intergovernmental Panel on Climate Change released an important report on Friday, February 2, 2007. "Climate Change 2007: The Physical Science Basis" is available at http://www.ipcc.ch/SPM2feb07.pdf.

Future ASPB Meetings

2007: Chicago, Illinois

July 7–11
Hilton Chicago

ASPB will hold its 2007 annual meeting in conjunction with the Botanical Society of America (BSA), the American Bryological and Lichenological Society (ABLS), the American Fern Society (AFS), the American Society of Plant Taxonomists (ASPT), and the Phytochemical Society of North America (PSNA). Visit www.aspb.org/pb-2007 for more information.

Plant Biology 2008

Mérida, Mexico
June 27–July 2

Plant Biology 2009

Honolulu, Hawaii
July 18–22

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

ASPB and Open Access Publishing

The Internet has revolutionized scholarly publishing, and ASPB—like many of its sibling publishers, large and small—is working hard to determine how best to embrace the benefits of Internet publishing while avoiding its pitfalls. We feel that ASPB's unique position as publisher of two very highly regarded journals obliges the Society to innovate. But at the same time, we also have a responsibility to ensure that ASPB remains a vibrant organization long into the future. In light of these twin obligations, ASPB enthusiastically supports a revolutionary member-linked Open Access initiative in *Plant Physiology* but opposes federal efforts to pass laws that seek to impose a one-size-fits-all approach to Open Access publishing. We feel that such laws are unnecessary and unwarranted, and we are concerned that they might financially harm scholarly publishers (including ASPB), impeding their ability to innovate.

As a membership organization, it is also our responsibility to keep ASPB members and the plant biology community at large informed about our activities and our concerns regarding new publishing models. To that end, we have assembled at **www.aspb.org/openaccess/initiative.cfm** a list of links to editorials, newsletter articles, and letters that ASPB has either developed or, together with other scholarly publishers, signed on to. In addition, we have included links to two freely accessible articles on the promises and perils of Open Access publishing recently published by two prominent sibling societies: the American Society for Cell Biology and the American Society for Investigative Pathology.

We welcome your comments and questions, whether regarding Open Access in general, ASPB's current Open Access initiatives, or its legislative stance. Please feel free to send any thoughts or feedback to the attention of Nancy Winchester, director of publications, at nancyw@aspb.org so that she may pass it along to us.

Richard Amasino, President
Michael Thomashow, Past President
Rob McClung, President-Elect
January 2007

Attention: International Members Attending Plant Biology & Botany 2007

Dear ASPB International Member:

I'd like to take a moment of your time to let you know that at ASPB's request, the U.S. Department of State has added ASPB's 2007 annual meeting, Plant Biology & Botany 2007, to its register of approved international scientific meetings. This means that information regarding Plant Biology & Botany 2007 has been sent to U.S. consular offices worldwide, which should help expedite visa processing for individuals planning to attend the meeting. Even so, it is still important for you to begin your visa application process 4 to 5 months in advance of your planned travel date—i.e., no later than February—if you intend to join us in Chicago, July 7–11.

With registration and abstract submission opening in January 2007, you have extra time to obtain a letter of invitation from ASPB and take advantage of early-bird pricing at http://www.aspb.org/pb-2007. Many countries require a letter from ASPB as part of the visa application. To obtain a letter, just visit http://www.aspb.org/meetings/letterform.cfm. To find out more about abstract submission, go to http://www.aspb.org/pb-2007/abstracts/.

To obtain the latest information on visa-processing times at your location, you may wish to visit this new feature on the U.S. Department of State's website: http://travel.his.com/visa/tempvisitors_wait.php. Scroll to the bottom of the page, select your city from the drop-down menu, and hit the "get wait times" button. The system will instantly tell you the current wait time for visa processing at that location. Please note, though, that this wait time does not include additional time that you need to allow for setting up an interview with a consular official or completing the application process.

You can find additional tips from ASPB's Visa Information web pages (http://www.aspb.org/meetings/visainfo.cfm). Check these pages regularly for updated information and advice.

ASPB has been working hard to make it easier for plant scientists from outside the United States to attend our meetings. I hope you will consider responding to our efforts by making your own plans to attend the meeting in Chicago, and I look forward to meeting each of you there.

Best regards,
Crispin Taylor, Executive Director

ASPB Members Elected 2006 Fellows of AAAS

Congratulations to 14 ASPB members who were elected 2006 Fellows of the American Association for the Advancement of Science. They will be recognized for their distinguished accomplishments February 17, 2007, at the Fellows Forum during AAAS's annual meeting in San Francisco.

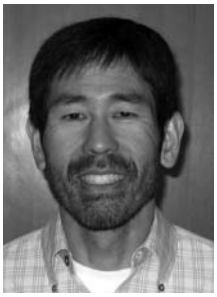
Biological Sciences

Shou-wei Ding
University of California, Riverside

Viral Pathogenesis and Host Defense

Pamela J. Green
Delaware Biotechnology Institute

Post-Transcriptional Mechanisms



John J. Harada
University of California, Davis

Molecular Functions Affecting Embryo and Seed Development

Kenneth Keegstra
Michigan State University

Plant Cell Wall Biosynthesis

Donald T. Krizek
U.S. Department of Agriculture

Distinguished Contributions to Plant Physiology in Photoperiod Research and the Direction of Programs in Sustainable Agriculture

Julian I. Schroeder
University of California, San Diego

Ion Channel Classes and Transport

Shauna Somerville
Stanford University

Plant–Pathogen Penetration Resistance

Elizabeth Van Volkenburgh
University of Washington

Physiological Mechanisms Driving Light-Stimulated Leaf Expansion

Daniel F. Voytas
Iowa State University

Plant Genomics and Transposable Elements

Clifford F. Weil
Purdue University

Transposable Element Interactions with Host Cell DNA Repair Machinery

Eleanore T. Wurtzel
Lehman College, The City University of New York

Provitamin A Biosynthesis in Cereal Crops

Martin Yanofsky
University of California, San Diego

Genetic Control of Flower and Fruit Development

Agriculture, Food, and Renewable Resources

Molly Jahn
University of Wisconsin–Madison

Breeding New Vegetable Varieties for Use Around the World, and for Gene Discovery in Crop Plants with a Focus on Economically Important Plant Traits

Pamela C. Ronald
University of California, Davis

Plant Innate Immunity, Creative Methods for Sharing Biotechnology with Developing Countries

Welcome, Newest Members!

ASPB is pleased to honor the following individuals as joining ASPB in 2006. We hope that you continue to benefit from your membership for many years. Contact us at info@aspb.org if you have any questions.

Mark G.M. Aarts
Kroot Aasamaa
Synan F. Abu Qamar
Manu Agarwal
Chul-Hyun Ahn
Ufuk Celikkol Akcay
Md. Liakat Ali
Darya Alizadeh
Michael Allen
Karina E. Alleva
Leticia Almanza-Sanchez
Ana P. Alonso
Carine Ameline
Gisele M. Andrade
Bloechl Andreas
Arunkanth Ankala
Edna Antony
Hiromi Arai
Jason M. Argyris
Pascal Arnoux
Yukari Asakura
Melani A. Atmodjo
Michele E. Auldridge
Eva Axelsson
Md. Abul Kalam Azad
Arun K. Azhagiri
Joshua J. Baecker
Douglas Baker
Siva Balasubramanian
Emilia Balsemao-Pires
Anjan K. Banerjee
William B. Barbazuk
Valentin Barca
Rachel Barnes
Pierluigi Barone
Jennifer K. Barry
Laura E. Bartley
Chhandak Basu
Nicholas Baumberger
Nonnatus S. Bautista
Julianna M. Beaulieu
Benjamin J. Becerra, Jr.
Peter Bendel
Vagner A. Benedito
Robert J. Bensen
Catherine Bergounioux
Stephanie M. Bernard
Nirit Bernstein
Emily R. Beynon
Neela S. Bhave
Meredith L. Biedrzycki
Damla Bilgin
Pavla Binarova
Frances Bligh
Kristine L. Blum
Marie-Beatrice Bogeat-Triboulot
Marietta P. Boisdore
Yung-tsi Bolon
Marie Boudsocq
Laurie E. Boyden
Bryan W. Brendley
Kathryn Brown
Marcia M.O. Buanafina
Jozef J. Bujarski, Jr.
Urska Bukovnik
Vincent Bulone
Mark M. Burrell, Jr.
Robin Butler
Ramesh Buyyarapu
Caitlin S. Byrt
Lance Cadle-Davidson
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Cecilia C. Candelario
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Ratnesh Chaturvedi
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Kuang-Yu Chen
Ming Chen
Tingsu Chen
Xuemei Chen
Zhongying Chen
Zong-Ming (Max) Cheng
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Su-Fen Chiang
Hyojin Cho
Misuk Cho
Yong Eui Choi
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Cory A. Christensen
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Takehiro Masumura
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Plant Biology & Botany

2007 JOINT CONGRESS

JULY 7 THROUGH JULY 11, 2007 • HILTON CHICAGO, CHICAGO, ILLINOIS

Special Plenary Speaker

Judge John E. Jones III

Plenary Address, Sunday, July 8, 7:30 pm, Hilton Chicago

In 2005 Judge John E. Jones III presided over the landmark case *Kitzmiller v. Dover School District,* after which he held that it was unconstitutional to teach Intelligent Design within a public school science curriculum. He will address attendees of the 2007 meeting immediately following opening addresses by the presidents of ASPB and the Botanical Society of America.

Judge Jones began his service as a U.S. district judge on August 2, 2002. He is the 21st judge to sit in the Middle District of Pennsylvania. He was appointed to his current position by President George W. Bush in February 2002 and was unanimously confirmed by the U.S. Senate on July 30, 2002.

In November 1994, Pennsylvania Governor-Elect Tom Ridge named Judge Jones as a cochair of his transition team. Subsequently, in May 1995, Governor Ridge nominated Judge Jones to fill a vacancy on the Pennsylvania Liquor Control Board, which is the largest state liquor monopoly in the United States. After Judge Jones's unanimous confirmation by the Pennsylvania State Senate, Governor Ridge appointed him chairman of the board. Judge Jones served as chairman of the Pennsylvania Liquor Control Board for a total of seven years and two months, until he assumed his current duties. During his tenure on the Liquor Control Board, Judge Jones implemented substantial changes in liquor licensing procedures designed to both streamline and shorten the process, including use of the Internet to apply for and renew liquor licenses. He managed a workforce of more than 4,000 people and administered a budget in excess of $1 billion. Judge Jones also gained national attention in the area of alcohol education, with particular emphasis on underage drinking at college campuses and drunk driving. In November 2000, his contributions were recognized when he received the Government Leadership Award from the National Commission Against Drunk Driving in Washington, DC. At the time of his appointment to the bench, he was a board member, and president-elect, of the National Alcohol Beverage Control Association.

Judge Jones has received the Distinguished Alumnus Award from the Dickinson School of Law, as well as an honorary doctorate in law and public policy from Dickinson College. In May 2006 he was named by *Time* as one of the 100 most influential people in the world. Judge Jones has also received a Rave Award for Policy from *Wired.* In 2006 he was the recipient of the first John Marshall Judicial Independence Award, which will be presented annually by the Pennsylvania Bar Association.

He has presided over several noteworthy and high-profile cases. In 2003 he struck down portions of Shippensburg University's speech code on the basis that it violated the First Amendment's free speech guarantee. In that same year he ruled, in a decision later affirmed by the U.S. Supreme Court, that the U.S. Department of Agriculture's statute assessing milk producers in order to fund advertising, including the Milk Mustache/got milk® campaign, did not infringe the free speech rights of the producers.

In 2005 Judge Jones presided over the landmark case *Kitzmiller v. Dover School District.*

http://www.aspb.org/pb-2007

Outside the Ivory Tower

Joining the "Real World"

I still remember the first time I set foot into the office building on Theobald's Road, the London home of Elsevier's life science review journals. A sign at the entrance said "Couriers please use back entrance for deliveries" and while moving slowly through the impressive entry hall, I kept wondering if I would be directed to the back entrance. The reason for my concern was that I did not naturally blend in with the smartly dressed crowd entering the building. With my cycling outfit, complete with helmet and backpack, I could easily be mistaken for one of the many cycle couriers operating in London. As a matter of fact, I was looking for Elsevier's post room to hand deliver my written test for the editor's position of *Trends in Plant Science.* At the same time I just couldn't take my eyes off the glass structure opening up before me. Sunlight was streaming in through the glass roof, and eight floors of open-plan offices seemed to be suspended in mid-air. Glass footbridges spanning the hall at every floor reminded me of a scene from *Star Wars.*

The Path Ahead

It had all started two years earlier when I made the decision to leave the bench and actively consider alternative science careers. Until this point I had followed what seemed to be a pretty straight line, with bachelor's and master's degrees in biology and a PhD in molecular biology and plant science. Life at the bench seemed to suit me, so I moved from Germany to England for postdocs in plant science and animal cell biology. About one year into the second postdoc, I started to consider other options for the future. The next step in the natural progression did not seem quite so natural to me. I had been fortunate enough to work in excellent research groups, my publication record was nothing to be ashamed of, and I very much enjoyed working at the bench. Nevertheless I couldn't quite see myself running a research group. So what alternatives were actually open to me besides running gels and preparing DNA?

Decision Time

My second postdoc position was at University College London (UCL), then one of the few places in the United Kingdom featuring a useful career advice center. I took a crash course on transferable skills, and with newfound confidence in my abilities I started browsing the job pages in the local papers. A part-time position for native German speakers caught my eye. Only one week and a short test later I was working a few hours a week translating medical and agricultural patent applications from German into English. This seemed to be a step in the right direction. I was using my scientific expertise but also had a first taste of working outside academia. However, most importantly, this helped me with further networking, and I soon had a second part-time position in publishing. The rest, as they say, is history. My postdoc position came to an end, and when the editor's position for *Trends in Plant Science* was advertised I felt it had my name written all over it. The timing was perfect: The office was only 10 minutes away from my current location at UCL, and by now I had a real taste for working in publishing. As a student I had been a keen reader of *TiBS (Trends in Biochemical Sciences),* and the thought of possibly running a *Trends* journal was a dream come true.

Key Skills

Needless to say, the job interview went well (not turning up in cycling shorts certainly helped), and I am now looking back on six years of being at the helm of *Trends in Plant Science.* Within two years, I was fortunate enough to be offered a promotion to managing editor and currently manage 12 *Trends* editors, somewhat ironic considering that I had not been able to see myself leading a research group. My core job is still the running of *Trends in Plant Science;* however, I am also overseeing the recruitment, mentoring, and training of new editors as well as setting the business objectives for more senior editors. It has been an amazing journey, and although it might all sound like a natural path taken, I did have to overcome several obstacles.. To mention but one, I had to work hard to polish my English language skills, and I doubt that I will ever be finished learning on that front. If I had to nominate the three key skills that helped me succeed in publishing, they would be organizational skills, the ability to multitask, and diplomacy. My organizational skills have enabled me to make the most of opportunities and to take on new responsibilities when I thought I couldn't possibly squeeze in any more tasks. Multitasking is simply the only way to survive the relentless schedule of a monthly publication, and diplomacy is very helpful for people management and when dealing with authors, referees, or other external contacts.

New Adventures Ahead

Some things have not changed since my first day on Theobald's Road. I still enter the building in cycling shorts, weather permitting. My first look is still up to the glass roof every time I walk across the entry hall. Six years of searching for the latest trends, travelling to dozens of conferences, and meeting many hundreds of scientists have not dampened my enthusiasm for the job in any way. On the contrary, these are the highlights of the editor's life.

I have described my path away from the bench into an exciting new career in publishing. When asked if I have ever looked back, I have always replied "not for a second," and I still stand by that statement. This was the right move for me. I love my job, and I still have to pinch myself sometimes to believe that I am not just dreaming. However, this type of job is not for everyone. Working in publishing is relentless, the schedule can be punishing, and the deadlines very stressful. The ability to multitask and prioritize is vital, and good stress manage-

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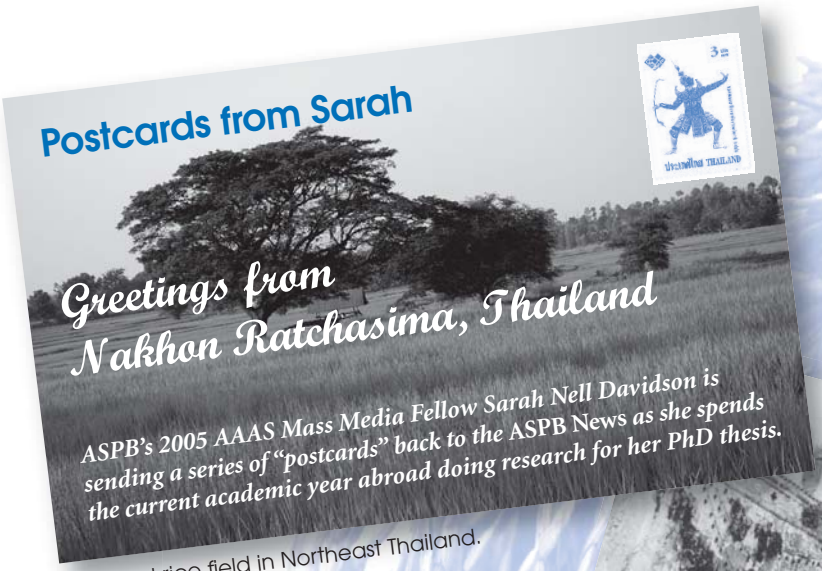

A typical rice field in Northeast Thailand.

"Dr. Jim" and his graduate students take a break from their experiments to pose for a photo.

The city gate of Khorat, home of Suranaree University of Technology.

The Challenges of Research in Paradise

Heavily touristed as Thailand is, few travelers step off the bus between Bangkok and Laos long enough to experience Thailand's largest region, the agricultural northeast. These 19 provinces, collectively known as Issan, are dominated by flat verdant rice fields where poor farmers struggle to carve out a living in Thailand's forgotten backyard. The city of Nakhon Ratchasima—more commonly known as Khorat—is the gateway to Issan and home of Suranaree University of Technology (SUT). It is also the place that for the past 12 years ASPB member James Ketudat Cairns has called home.

Cairns, or "Dr. Jim," as his students refer to him, begins his day around 5 a.m. with a run through the campus forest. Donning a cap he received after winning the Fun Run during Plant Biology 2005 in Seattle, he sets off early to avoid the oppressive sun, which inevitably rises before he reaches his morning finish line. Cairns grew up in rural eastern Oregon and headed south for a PhD in biology at the University of California San Diego, where he developed as a protein biochemist within a mammalian system. After finishing, he moved to Thailand with his wife Mariena Ketudat Cairns, who owed the Thai government four years of scholarship service. The couple landed in Khorat, and Jim switched fields to study the biochemistry of plants and is now an associate professor in the Department of Biochemistry at SUT, while his wife is a member of the Department of Biotechnology faculty on the same campus.

In a country where scientists are promoted and monetarily rewarded for pursuing administrative positions and where little research and infrastructure investment trickles out of Bangkok, maintaining a competitive research group is a huge challenge, especially for a non-Thai "outsider." Fortunately, Jim was able to find support and encouragement from accomplished Thai researchers such as Professor Jisnuson Svasti, with whom he collaborates on much of his work.

Besides being faced with a new language (in which he is now fluent) and different educational and political systems, Jim has found more subtle challenges in the laboratory. For example, his department received funding from an international development program to get an HPLC-mass spectrometer. But by the time the funds squeezed through the bureaucratic red tape, the specified model was so out-of-date that they could not get the software to run it. And without the equipment and license to use radioactive isotopes, even something as "vanilla" as a Southern Blot can be a challenge. "You can't order a chemical and get it the next day," Jim points out. "If you are lucky, it takes three weeks; if you are unlucky, you wait three months."

In "the middle of nowhere, Thailand," you have to be especially stubborn to move your research program along and stay competitive internationally. "You have to be motivated enough to get past the hardships," Jim says matter-of-factly. "Molecular biology and biochemistry are moving so fast that with our limited resources, by the time we get up to speed on something, it is often considered trivial."

"As a foreigner, I have to work extra hard, because I want to be a part of the international community," Jim says. He joined ASPB initially because he wanted access to the journals, and at the time the SUT library did not subscribe. But his membership with the Society also helps him feel connected internationally despite his relative isolation.

In spite of the hardships, Jim's group is making significant progress characterizing the structure and function of their favorite proteins, the 35 b-glucosidases in rice. And in a recent ranking of universities by the Office of Higher Education Commission, SUT ranked third in research functions among universities in Thailand.

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A Plea for a Wider Ethical Responsibility

The several *ASPB News* contributions by Dina Mandoli have constructively helped define the ethical responsibilities between scientists. I suggest that there now is a serious need for an extension of our concerns to a wider range of ethical responsibilities.

Historically, ethical responsibilities were limited to ethical relations between people, with such moral values as defined in the Golden Rule and in the Ten Commandments. George Marsh (1864) expanded our ethical awareness to include a concern for all living things. Aldo Leopold (1949) expanded ethical concerns still further with his Land Ethic—that is, an ethical responsibility to our environment, including living things, the soils, Earth's resources, and whole environmental communities. Potter (1988) then defined an even wider range of ethical responsibilities, espousing Global Bioethics—an ethical responsibility for the integrity of our planet. This increasing span of ethical responsibilities has evolved as the world has become increasingly crowded, with consequent greater awareness of our global environmental impacts.

Long ago, Dobzhansky (1958) interpreted the fossil record of animal extinctions as evidence that the evolutionary system involves a "Fatal Flaw." That is, evolution leads to the formation of species that are adapted specifically to a given environment, but when the environment changes, an inability to adapt to the changes can be fatal to the species. Changes in environment bring out the Fatal Flaw. Over geologic time, environmental changes have brought about the demise of millions of species. And, of course, environmental changes have led to the collapse of human empires as well (Diamond, 2005).

Readers of the *ASPB News* know that our environment—our local environment, our regional environment, our Earth environment—is changing in major ways. Note the serious changes occurring with population expansion; urbanization; climate change; depletion of our major energy sources; deterioration of our major natural resources, including soils, oceans, and forests; the pollution of air; the limitations on potable water; and the copious spread of hazardous waste. Now, as population pressure combines with competition for limited resources, major social damage and upheaval occur (e.g., genocide, war). Face it: Our environment is changing dramatically. Our own impact will increasingly challenge both our environment and our social structure.

I suggest that our concentration of ethical concerns toward anthropocentric and economic issues is increasing the likelihood that Dobzhansky's concept of the Fatal Flaw may come to bear. For our culture to survive the ongoing changes, it seems that our ethical responsibility will have to broaden considerably. Our political system is not able to focus on our environmental problems. Our university system teaches concerns about ethics but mostly social/anthropocentric concerns. It is my fear that our focus on short-term economic gains and our scientific focus on highly reductionist analyses and technologies do not sufficiently address our drift toward drastic environmental changes, changes that may outrun our abilities to adapt to them.

Can we claim that our science and our technologies will allow us to adapt to the collective changes that we are imposing on our environment? This is my plea for a wider ethical responsibility toward stewardship of our rapidly changing planet. It is possible that Global Bioethics may be the most important concern in contemporary human history.

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LET US HEAR FROM YOU!

The *ASPB News* welcomes comments on topics covered in the newsletter and on other points of interest to the profession. Letters are published as space permits and may be edited for clarity and length. Submissions may not necessarily be published; receipt is not acknowledged. Mail letters to Editor, *ASPB News,* 15501 Monona Drive, Rockville, MD 20855-2768 USA; e-mail nancyw@aspb.org.

Announcing the 8th Annual ASPB Education Booth Exhibitor Competition in Chicago!

Dear ASPB Member,

Grants are available to ASPB members in the Education Exhibit Competition. Have you developed new ways of carrying out hands-on science in your teaching laboratory or classroom? Have you developed effective outreach tools you'd like to share?

The Education Committee cordially invites you to share your activity with the ASPB membership by hosting an interactive exhibit or demonstration at the Education Booth at the annual ASPB meeting this summer in Chicago. The annual meeting will be held July 7–11, 2007.

The Education Committee is looking for new ideas and technology being used in the classroom or in outreach efforts and, as an incentive, is offering a cash grant of $500 and registration costs for up to three presenters. Your proposal should be no longer than four double-spaced pages. It should include a title and the address and contact information of the presenter(s). Please address the following questions in your proposal:

1. State clearly the rationale behind the exhibit. Highlight the use of new techniques, pedagogies, or technology. How is this presentation exciting and new?
2. Provide a clear, detailed summary of how the exhibit will function (a diagram or picture would be helpful). In particular, it will be important to illustrate how the visitors can interact with the exhibit.
3. Indicate the equipment that will be required for the exhibit, including computers, Internet connection, DVD player, monitor, and the like. Indicate what you will provide and what you would need ASPB to provide. We will make every effort to meet your needs.

Note that awardees are expected to spend some time hosting their exhibit and interacting with members at the booth each day. You're welcome to choose the times most convenient for you.

We can't think of a better opportunity to showcase your new approaches or new technology for the plant biology classroom. We hope that you will consider submitting a proposal and will join us at the booth for these exciting exhibits!

Your proposal should be addressed to Education Committee member Jeffrey Coker (jcoker@elon.edu) and submitted as an e-mail attachment (Microsoft Word) by no later than March 21, 2007. Winners will be notified by April 16, 2007.

An article in the November/December 2006 issue of the *ASPB News* highlighted Education Booth exhibits from last year's meeting in Boston. The article may be found at http://www.aspb.org/newsletter/novdec06/26ed2.cfm.

Kind Regards
The American Society of Plant Biologists

Plant Biology & Botany
2007 JOINT CONGRESS

JULY 7 THROUGH JULY 11, 2007
HILTON CHICAGO, CHICAGO, ILLINOIS

Postcards from Sarah
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Jim seems most at ease when mentoring his students. In addition to teaching biochemistry to the medical and agriculture undergraduate students, Jim currently oversees five graduate students. As a part of his international approach to teaching and research, he encourages all of his students to seek out research experiences abroad during their PhD tenure, and so far all have done so. Two of his students have presented their work at annual ASPB meetings, and most are actively involved in collaborations with researchers in the United States or Australia.

But according to Jim's former student and now colleague Rodjana Opassiri, graduating students will face additional hardship. "The government tries to recruit students to do a PhD, but they don't have a plan regarding who is going to hire them," she said. Referring to his most recent graduate's fate, Jim said, with half a smile, "If your requirements are working as a researcher and living outside Bangkok, you have to move to Taiwan."

Sarah Nell Davidson
snd2@cornell.edu

Membership Corner

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

Name: Barbara Hass-Jacobus

Title: Visiting Assistant Professor

Place of Work or School: Indiana University–Purdue University–Columbus (IUPUC)

Research Area: Plant Genetics

Member since: 2002

1. **Why has being a member of ASPB been important?**
   ASPB provides access to the plant community at large and up-to-date news on the latest in plant research through its various publications and services. This has been especially important to me during the past few months as I begin my new job at IUPUC, where I am one of only two full-time biologists and the only plant scientist.
2. **Was someone instrumental in getting you to join ASPB?**
   My postdoc mentor, Dr. Scott Jackson at Purdue University, encouraged me to become a member when I joined his lab.
3. **What would you tell colleagues to encourage them to join?**
   ASPB provides easy access to a plethora of plant science research and education resources, as well as numerous networking opportunities, travel awards, grants, and the Job Bank.
4. **Have you enhanced your career using ASPB job postings or through networking at an ASPB function?**
   I did apply for and was offered a job that was posted through ASPB.
5. **Have you had any success at finding candidates as a result of a job posting at the meeting or on our online Job Bank?**
   I have not done any hiring through ASPB.
6. **Do you read print journals? If so, where do you usually read them?**
   These days I read print journals only if the article is not available online or if I am browsing for journal club or teaching material. In the latter case, print journals are still easier to leaf through than electronic publications when I don't have a particular article in mind. Even if the article is available online, though, I will always print it out for an in-depth read.
7. **What do you think is the next "big thing" in plant biology?**
   A lot of money has been spent up to this point developing some key model systems, such as Arabidopsis, and collecting more high-throughput data than we know what to do with at this time. I think the next "big thing" will be the application of what we have learned from model systems to other species and the development of new methods to mine the massive repository of data that has been collected but not yet tapped to its fullest potential for new discoveries.
8. **What person, living or deceased, do you most admire?**
   Collectively, my parents, who have inspired and supported my career in plant biology. My mom is a teacher and school librarian for a small rural school district and was my inspiration for wanting to enter academia. I am continually amazed by her ability to assimilate new knowledge in a short amount of time, create new curricula designed to introduce the students in our rural community to the latest in technology and information science, and keep an up-to-date reference library complete with the latest technology her district can afford. She is also my first stop for those little bits of information I can't seem to find. She is like a bloodhound at tracking down information. My dad was never able to attend college despite a strong desire to do so, but he knows more than most people I know who hold PhDs. He has been a farmer all his life, and his knowledge of agriculture and all things mechanical surpasses anything I could hope to achieve in my lifetime. I am constantly learning from him to this day. The problem-solving and mechanical skills he taught me when I was growing up are not things that are taught in any plant biology curriculum, yet I feel those skills have played a large role in my success. It was my life as a farm kid that enticed me into the field of plant biology. During my childhood, my parents were caught up in the economic devastation felt by farmers across the United States over the past few decades and saw many of their dreams fall apart, largely due to circumstances beyond their control. Yet through their struggles, they taught me the importance of family, community, education, and perseverance.
9. **What are you reading these days?**
   The biology textbooks that I am using in the courses I teach. I figure if I require the students to read the material, I should read it, too. When I do have a spare moment for "fun" reading, which is sadly lacking these days, I've been reading Terry Pratchett novels.
10. **What are your hobbies?**
    Gardening and raising houseplants, rubber stamping, counted cross-stitch, and music.
11. **What is your most treasured possession?**
    I wouldn't use the term "possession," but my family is what I treasure most.
12. **What do you still have left to learn?**
    Everything. The more I learn, the more I find I have yet to learn. I tell my students that having a PhD doesn't necessarily mean I know more than they do, it just means I can be wrong with authority! I will always consider myself a student.

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: Sizolwenkosi Mlotshwa
Title: Postdoctoral Fellow
Place of Work or School: University of South Carolina
Research Area: Plant Molecular Genetics and Small RNA Pathways
Member since: 2003

1. **Why has being a member of ASPB been important?**
   Apart from being home to leading journals in plant research, ASPB hosts a highly interactive community of diverse plant researchers and offers endless opportunities for scientific networking and development. I think the ASPB website is the most comprehensive source of career development tools and opportunities for established and emerging plant researchers and educators. The Job Bank is a very helpful community resource, and the Education Forum is very enlightening. I appreciate ASPB support for K–12 education and for undergraduate fellowships and travel awards. This is a priceless investment of membership contributions to secure the future of plant research.

2. **Was someone instrumental in getting you to join ASPB?**
   Not anyone in particular, at least not to my recollection. As an emerging researcher in plant sciences, I believe my career benefited immensely from daily visits to the ASPB website to keep abreast of cutting-edge developments and trends in plant research. In the process I discovered tremendous benefits of ASPB membership.

3. **What would you tell colleagues to encourage them to join?**
   ASPB's programs are worthy of support for their focus on the career development of young people. In addition, ASPB offers excellent membership benefits that include, but are not limited to, discounts on chemicals, reagents, posters, and literature; a personal member website; annual meeting opportunities; undergrad and grad student awards to attend national meetings; discounts on registration fees for ASPB meetings; a free résumé posting to the Job Bank; and opportunities to network with fellow researchers. Once a member, you will find even more worthy reasons to always remain one.

4. **Have you enhanced your career using ASPB job postings or through networking at an ASPB function?**
   I was once recruited for a position that I first saw in the ASPB job postings.

5. **Have you had any success at finding candidates as a result of a job posting at the meeting or on our online Job Bank?**
   I have yet to use this service for recruitment. But I find the ASPB online Job Bank to be the most resourceful and timely job service for the scientific community, so it will be my first recruitment stop as soon as I get the opportunity to start my own research group. I highly recommend it to any job recruiters engaged in plant research.

6. **Do you read print journals? If so, where do you usually read them?**
   I do read print journals, from the library. Still remains a refreshing experience.

7. **What do you think is the next "big thing" in plant biology?**
   Molecular pharming. I cannot wait to see plants being used on a large scale as biofactories for vaccines and other medicinal products that would be more affordable to low-income families.

8. **What person, living or deceased, do you most admire?**
   Bill Gates, for filling the leadership vacuum in the fight against HIV/AIDS. Isn't this the greatest crisis facing humanity in our lifetime?

9. **What are you reading these days?**
   Besides *The Chronicle of Higher Education* and the latest literature on microRNA biology? *The Alchemist* by the Brazilian-born author Paulo Coelho (for the third time, I think). If you long for a brief vacation away from yourself, get hold of this book. I am also reading *Environmental Costs and Benefits of Transgenic Plants* by J.H.H. Wesseler (Ed.).

10. **What are your hobbies?**
    Playing musical instruments. I sometimes daydream that one day I will be my favorite jazz guitarist, ahead of Jonathan Butler and Lee Ritenour. I would also like to see myself doing more volunteer work in science outreach programs.

11. **What is your most treasured possession?**
    Good health.

12. **What do you still have left to learn?**
    A whole lot indeed—obviously, so much remains out of sight. I don't think it would hurt to uncover more reasons for this brief transit through planet Earth. Is there any extraterrestrial life out there? I wish this question could be answered in my lifetime. In the meantime, I might try to learn a new language. What about Dutch…om het even welke gewillige Nederlandse privé-leraren uit daar? Or my own Ndebele/Zulu mother language: Ukhona ofisa ukungifundisa isi Dutch?

The Bioethics Imperative XXVII

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

(continued from the November/December 2006 issue of the ASPB News)

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

Conclusion

"What is being done to resolve the challenges presented by current compliance practices? All institutions of higher learning in this country are hamstrung and are seeking relief from the consequences of the current state of affairs regarding FEC [faculty effort certification] interpretation, which strike at the core of who we are as scholars. Some [University of Washington] administrators are members of the Council on Governmental Relations (COGR, an association of research universities), the Association of American Medical Colleges (AAMC), and the Association of American Universities (AAU) Committee on Effort Reporting, which are all actively seeking remedies to these problems with the government, though this is expected to be a long-term process with no quick-fix in sight."(1)

Society is a better place because of the research conceived, conducted, and disseminated in higher education institutions. The federal government and the taxpayer are critical partners in our ability to advance knowledge, and thus they have a right to require documentation of our accountability. Can we—administrators, government agencies, and universities and faculty—find an easier, less convoluted way to document and account for faculty effort?

I write "The Bioethics Imperative" (TBI) in an attempt to raise difficult questions, to seek answers that are sometimes elusive, and ultimately to open discussion in order to foster clarity and relief from the unnamed tensions that face academia. One ASPB member told me that after reading TBI XXIII he was scared. Wait until he reads TBI XXIV and XXV! "I'm not scared, Yoda," says a young ASPB member. You will be. May the force be with us.

P.S. Did you know that, technically, if you buy a pencil on one grant you cannot use it to work on another grant?

Next time: Hybrids: when a case involves more than one type of allegation.

Dina Mandoli
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I thank Brent Stewart (chair of the Faculty Council on Research, University of Washington) for permission to quote from the FCR report on FECs and two administrators at UW who provided detailed input and depth to the issues and who wish to remain anonymous.

Reference

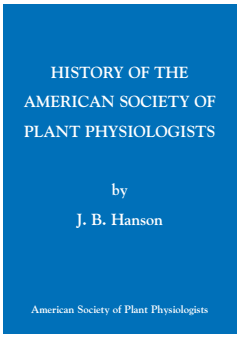
1. University of Washington, FCR Report to the Faculty Senate Regarding Faculty Effort Certification, January 19, 2006.

Women in Plant Biology
continued from page 11

ment is a must. I know that some editors, even after years in the business, still lose sleep over their work. This is very hard to sustain over a long period of time and can eventually lead to a breakdown.

To present a realistic picture of the publishing industry: This part of the business world is very competitive but also constantly evolving. Since my move into publishing, I have seen many changes, including several mergers and the introduction of new technologies. Many job descriptions have changed in the process, and positions that seemed permanent suddenly disappeared. At the same time new positions were created, offering new opportunities and challenges. The take-home message is to keep one's ear to the ground, to monitor developments closely, and to try to always stay one step ahead of the game.

Susanne Brink
Editor, *Trends in Plant Science*
plants@elsevier.com



Amasino, Stacey Cite Plant Bioenergy Research Opportunities in Agriculture

In a letter sent October 11 to Department of Agriculture Undersecretary for Research, Education, and Economics **Gale Buchanan,** ASPB President **Rick Amasino** and Committee on Public Affairs Chair **Gary Stacey** outlined plant bioenergy research areas that could reduce dependence on foreign oil. Stacey and Committee on Public Affairs staff met with the undersecretary in his office November 20 to discuss recommendations in the letter.

Buchanan responded that he is confident funding will be made available to address many of these issues during the coming months and years as ways are sought to address the president's energy initiative.

In the October 11 letter, Amasino and Stacey noted that the president's Advanced Energy Initiative (AEI) and the American Competitiveness Initiative (ACI) are visionary research initiatives that will boost domestic bioenergy production and the national economy.

Following are portions of the letter:

As you know, the Department of Agriculture is collaborating with the Department of Energy and National Science Foundation in a number of important research programs that address the goals of the AEI and ACI. We urge you to seek inclusion of USDA research agencies in the AEI and ACI in future fiscal year budgets. Inclusion of Department of Agriculture research agencies in the AEI and ACI would further contribute to the success of The President's efforts to overcome the nation's addiction to foreign oil….

USDA–NRI plant research programs on gene expression and genetic diversity; environmental stress; plant biochemistry; plant growth and development; plant genomics; biobased products and bioenergy production research; and other key areas provide valuable knowledge that plant breeders and growers will need to sustain increased bioenergy crop production. As we commented at the Stakeholders' Workshop on Plant and Pest Biology, a five year-doubling of support for these

Undersecretary Gale Buchanan

research programs is needed. The basic knowledge gained from these NRI research programs is urgently needed to help transition to a bioenergy-based economy.

Increased support for research supported by USDA–CSREES and USDA–ARS is also needed in the following areas.

1. Carry out long-term sustainability studies on plants that are being considered for energy crops. What is needed are studies at many geographical locations for many years in which the productivity of stands of perennials (e.g., switch grass, Miscanthus) and annuals (corn, sorghum) are harvested at various levels (e.g., 0% of biomass, 100% of biomass) and subsequent biomass productivity is measured. This would be a very big experiment because there are many combinations of location, species, cropping level, inputs, etc.
2. Expand collections of species that can be used for biofuels. There are relatively few accessions of potentially important bioenergy species such as switch grass and Miscanthus in the GRIN system.
3. Improve the breeding systems for perennial C4 grasses. Most of the species such as switch grass that are likely to be used as dedicated energy crops are self incompatible and, therefore, not amenable to development of true breeding lines for hybrid seed production. Basic studies on the mechanisms of self incompatibility in the grasses would be very useful for future breeding programs.
4. Identification of useful species. Are there additional plant species that could be useful as bioenergy crops?
5. Identification of herbicides that can be used during establishment of various energy crops.
6. Identification of pests and pathogens that are likely to be problems for potential energy crops. Survey for genetic diversity in natural resistance to such pests and pathogens. Develop pesticide management practices.
7. Determine optimal methods for long-term storage of harvested energy crops.
8. Evaluate fire management practices (i.e., how should energy crops be planted to minimize the danger of large fires). Are there risks associated with certain crops or with certain cropping practices?

We appreciate your keen understanding of major contributions photosynthesis research can make to bioenergy production. There are a number of specific research targets that would contribute to enhanced net photosynthetic production of feedstock crops.

- ***Responsiveness to elevated CO_2.*** CO_2 is increasing in the atmosphere and will continue to do so attaining levels 1.5 times current levels by the middle of this century. In principle, CO_2 should "fertilize" photosynthesis in C3 plants both by stimulating the rate of primary carboxylation and by suppressing photorespiration. But the stimulation is often substantially less than expected from theory. Moreover, what is already understood about photosynthesis suggests a variety of refinements that would increase the expected CO_2 enhancement. Research aimed at understanding the determinants and improving the responsiveness of feedstock crops should be strongly supported.
- ***Staying green (delayed senescence).*** Net photosynthetic production is dictated by efficiency of photosynthesis, the amount of light that is intercepted per day, and number days that the crop intercepts

light. Research aimed at delaying leaf senescence and the dismantling of the photosynthetic apparatus in the Fall has significant potential for improving seasonal biomass production of biofuel crops.

- ***Refining photoprotection.*** Plants, nearly on a daily basis, experience for a portion of the day more light than they are able to utilize in photosynthesis. For this reason, sophisticated photoprotective mechanisms have evolved that prevent damage to photosynthetic apparatus. However, these photoprotective mechanisms compete with photosynthetic efficiency. Although the trade-off between efficiency and photoprotection is clear, from an agricultural perspective, it is less apparent how well the dynamic range of the trade-off is suited for agricultural environments and productivity goals. In fact it seems clear that forfeiture of photosynthetic efficiency may under some circumstances exceed that required to prevent photodamage thus reducing net photosynthetic productivity more than necessary. It is likely that net photosynthetic production could be improved by more than 15% by research aimed at refining the control of photoprotection processes.
- ***Reducing photorespiratory losses.*** In C3 plants, photorespiration competes with photosynthesis and lowers net photosynthetic production by about 20%. Explaining why the suppression of photorespiration occurs continues to be an important goal of photosynthesis research. Newly emergent research tools and approaches clearly justify revisiting this high priority goal of photosynthesis research.
- ***Improving water use efficiency.*** Plants are forced to give up a great deal of water to take in a small amount of CO_2; the ratio of water molecules lost to CO_2 taken up into the leaf can be as much as 1000 to 1 under agricultural conditions. This makes net photosynthetic production very dependent on water and very susceptible to drought. However, water use efficiency, generally defined as the amount of biomass produced per unit of water used, varies among agricultural plants and even among cultivars of the same species (e.g., soybean). Research focused on discovering the genetic and physiological determinants of water use efficiency should be a high-priority goal for biofuel feedstock research.
- ***Photosynthetic electron transfer.*** Further understanding is needed of the basic photochemical processes involved in photosynthetic electron transfer. The objective would be to elucidate the primary photochemical processes involved in water oxidation. A more fundamental understanding of these processes could provide useful insights into developing synthetic mimics that could produce hydrogen from water with oxygen as a by-product.
- ***Characterization of carbon-partitioning mechanisms in plants.*** The objective would be to design metabolic engineering strategies to enhance carbohydrate storage for biofuel production. For example, researchers are discussing ways to reduce non-fermentable fiber, and a promising way to do this is to modify carbon partitioning mechanisms.

Metabolic Engineering

To transition to a plant-based energy economy, more investment is needed in plant research on metabolic engineering. In order to attempt to modify existing crop plants (or other plants that would then serve as new energy crops) in a way that will enhance their properties for use as either fuels or as specialty chemical feedstocks, we must understand the metabolism of those plants, and we must be able to predictably and accurately modify the metabolism in those plants. There is a rapidly growing and significant body of literature that demonstrates that production of specific individual compounds in plants is not predictable with current knowledge. Further knowledge will be needed in metabolic engineering to change large subsets of metabolism as may be required for alterations in biomass production.

Competing with All Imported Petroleum Market Sectors

We recommend collaborations between the Department of Agriculture and the Department of Energy in identifying ways to derive energy from a broad variety of plants for ethanol, cellulosic ethanol, and biodiesel. Both Departments have relationships with plant scientists who could share their knowledge on ways to exploit energy sources in plant cellulose in switch grass, Miscanthus, trees, wood chips, crop residues, and other sources of biomass.

Along with corn and sorghum, there are future ethanol production opportunities research could offer with sweet potato, sugarcane, and other crops. For sugarcane, research would be needed to increase drought and cold stress tolerance. Gains in production in biodiesel from soybean and other regionally grown oil seed crops could result from accelerated bioenergy research. In addition to production of biofuels, increased support for plant bioenergy research could lead to advances in production of high-value biochemical products, such as superior quality nylon and polyurethane that have historically been derived from petroleum.

We recognize that a substantial investment of new funds is needed for the Department of Agriculture to pursue bioenergy-related plant research recommendations presented in this letter. It is essential to continue strong support for existing research programs. New funds are needed to undertake these research initiatives.

Investment of new funds in these recommended areas would result in huge benefits for the nation and its citizens. With advances in plant bioenergy research leading to production gains in home-grown ethanol, cellulosic ethanol, biodiesel, and biochemical products, American farmers won't need to concede a single segment of the nation's energy supply market to foreign oil. This transition to home-grown biofuels will boost regional and local economies; help lower and stabilize fuel prices just as food-related plant research has helped stabilize the cost of food; reduce the national trade deficit; enhance national security; and dramatically reduce emissions of stored carbon dioxide.

Congressman Rogers Visits Thomashow, Keegstra, Colleagues at PRL

Congressman Michael Rogers (R-MI), a strong advocate of alternative energy, including bioenergy, visited with plant scientists at the Michigan State University–Department of Energy Plant Research Laboratory (PRL) in Lansing on October 25. ASPB Immediate Past President **Michael Thomashow** and ASPB Past President **Kenneth Keegstra** hosted the visit.

Congressman Rogers and his legislative aide, **John Simpson,** talked with Thomashow, Keegstra, and 10 plant scientist colleagues at the lab and centralized genomics facility for nearly an hour.

"We did an informal tour and had a small demonstration on plant genomics. We discussed the importance of fundamental research in plant biology and its relevance to practical applications, mainly the production of cellulosic ethanol," Keegstra said.

Keegstra noted that Congressman Rogers demonstrated keen interest in bioenergy research opportunities, especially with regard to cellulosic ethanol. Thomashow explained the importance of basic work on plant responses to stress. He noted the relevance of this research in many areas, including cellulosic ethanol production.

Congressman Rogers is a member of the Energy and Commerce Committee, including the Subcommittee on Energy and Air Quality. The Energy and Commerce Committee and Science Committee have authorizing jurisdiction over the Department of Energy.

Congressman Michael Rogers (R-MI) (center) and his legislative aide, John Simpson (left), were hosted by Kenneth Keegstra (right), Michael Thomashow, and their colleagues in a tour of the MSU–DOE Plant Research Lab on October 25. Congressman Rogers, a member of the Energy and Commerce Committee, is a strong supporter of bioenergy research, including plant research leading to cellulosic ethanol. Rogers supports research leading to increased production of home-grown biofuels to help boost the economy and reduce the nation's dependence on foreign oil.

The supply and delivery of energy is a major area of legislative oversight for the Energy and Commerce Committee. MSU is in Congressman Rogers's district.

ASPB Public Affairs staff worked with Congressman Rogers's office and the PRL in scheduling the visit. ASPB Public Affairs staff also met with Congressman Rogers and John Simpson in the Capitol Building September 13 on plant-related bioenergy research opportunities.

Keegstra and Thomashow said they greatly appreciated the congressman's friendly interactions with them and his strong interest in plant research pathways to bioenergy.

Democrats Announce Continuing Resolution Through FY2007

Democrats in Congress announced December 11 that they plan to enact a continuing resolution to fund federal government spending for the duration of fiscal year 2007. Just days earlier, Congress had passed a stopgap continuing resolution running through February 15. The incoming chairmen of the House and Senate Appropriations Committees said they would simply extend the measure rather than attempting to pass the remaining FY2007 appropriations bills.

Incoming Appropriations Committee chairs **Congressman David Obey** (D-WI) and **Senator Robert Byrd** (D-WV) said they would make "limited adjustments" in the continuing resolution to address important policy priorities. They said the extended version would have none of the earmarks contained in the remaining FY2007 spending bills. The Democrats said they were placing a moratorium on all earmarks until reforms are put in place. Only two FY2007 spending bills for Defense and Homeland Security measures have been signed into law. That leaves about $463 billion in unfinished agency budgets that will be funded under the continuing resolution. If the terms of the continuing resolution are the same as they are for the current short-term continuing resolution, programs would be funded at the lowest of the appropriations bills passed in the House or Senate or in FY2006.

Unless the "limited adjustments" planned include increased support for science, this rarely used, nearly year-long continuing resolution is expected to result in reduced spending for science and other domestic programs in FY2007 compared to what the appropriations bills would have provided.

Important Dates in 2007

February 14
Abstract deadline to be considered for a minisymposium

February 15
Award and officer nominations deadline

February 23
Mid-Atlantic Section Meeting
University of Maryland
College Park
http://www.aspb.org/sections/washington/meetings.cfm

February 24
Executive Committee Meeting
ASPB Headquarters
Rockville, Maryland

March 3–5
Southern Section Annual Meeting
Mobile, Alabama
http://www.ss-aspb.org/meetings07.html

March 15
Early-bird registration cutoff for Plant Biology & Botany 2007

April 4
Abstract deadline for Plant Biology & Botany 2007 program book

May 18
Officer election closes

June 1–2
Northeast Section Annual Meeting
SUNY
Syracuse, New York

June 15
Pre-registration cutoff for Plant Biology & Botany 2007

July 6 & 10
Executive Committee Meeting
Chicago, Illinois

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

DOE Supports Studies of Lignocellulose, Phenotypic Screening

Plant scientists were encouraged through the ASPB website and ASPB Campus Contacts mailing in November and December to read the Department of Energy (DOE) solicitation DE-PS02-07ER07-12 titled "New Analytical and Imaging Technologies for Lignocellulosic Material Degradation and for Multiplexed Screening for Plant Phenotypes."

The Office of Biological and Environmental Research (BER) of the Office of Science, U.S. Department of Energy (DOE), announced its interest in receiving applications for research that supports the Genomics: GTL research program (www.genomicsGTL.energy.gov). In the first part of this solicitation, applications were solicited for the development of technologies for studying lignocellulosic systems, real-time characterization of such systems in the course of processing, and other innovative techniques that could facilitate lignocellulosic material degradation. The second part solicited the development of improved methods leading to high-throughput, sensitive, and selective phenotypic screening of plant feedstocks.

The deadline for required preapplications was 4:30 p.m. EST, January 4, 2007.

ASPB posted the notice on its website shortly after the announcement and sent the notice to ASPB Campus Contacts.

We appreciate the help of Dr. Sharlene Weatherwax of DOE–BER in providing this information.

Bement, Olsen, Collins Participate in PGRP Awardee Meeting

National Science Foundation Director **Arden Bement,** Deputy Director **Kathie Olsen,** and Biological Sciences Directorate head **James Collins** participated with plant scientists at the annual plant genome awardee meeting held September 7–8 at the National Science Foundation. The Plant Genome Research Program (PGRP) is within the Biological Infrastructure Division (**Machi Dilworth,** Director).

ASPB President-Elect **Rob McClung,** Committee on Public Affairs Chair **Gary Stacey,** Committee on Public Affairs member **Rob Last,** and a number of ASPB members interacted with NSF officials attending the program, including the reception.

The meeting offered the opportunity for new awardees to give presentations on their research projects and exchange information with past awardees. Hot topics sessions addressed novel mechanisms of genetic regulation, training and outreach for tribal colleges, and advances in comparative and ecological genomics.

Fiscal year 2006 Plant Genome Research awardees include **Philip Benfey, Volker Brendel, Robin Buell, Jerry Cohen, Alan Collmer, Douglas Cook, Ralph Dean, Richard Dixon, Anne Fennell, Sarah Hake, Jiming Jiang, Robert Last, Rob McClung, Richard McCombie, Susan McCouch, Todd Mockler, Thomas Okita, Jocelyn Rose, Ronald Sederoff, Andrew Settles, Jay Thelen, Clifford Weil, Susan Wessler, Richard Wilson,** and **Nevin Young.**

More information on their plant genome research can be found at http://www.nsf.gov/bio/pubs/awards/pgr.htm. Plant genome program directors are **Jane Silverthorne** (jsilvert@nsf.gov; cooperative agreements), **Diana Jofuku Okamuro** (dokamuro@nsf.gov; training and outreach activities, CAREER), **Anita Klein** (aklein@nsf.gov; research supplements, developing country collaborations in Plant Genome Research activities), and **Anne Lamblin** (alamblin@nsf.gov; databases and bioinformatics).

NSF Assistant Director, Directorate for Biological Sciences, James Collins (right) confers with University of Missouri Professor Gary Stacey, chair of the ASPB Committee on Public Affairs, at the PGRP awardees reception. Awardees were delighted to meet with Dr. Collins, Dr. Bement, and Dr. Olsen, who joined them at the reception.

NSF Director Arden Bement (left) and NSF Deputy Director Kathie Olsen (right, back to camera) converse with ASPB member Gloria Coruzzi of New York University at the PGRP awardees reception. Jane Silverthorne, PGRP Director, oversees reception activities in background.

NSF Deputy Director Kathie Olsen, ASPB President-Elect Rob McClung of Dartmouth College (center) and Dennis Stevenson of the New York Botanical Garden participated in the reception at the PGRP annual awardees meeting September 7.

USDA–NRI, ARS, BARD Research Boosts Nutrients in Wheat-Based Foods

Funding from the U.S. Department of Agriculture–National Research Initiative (USDA–NRI) and the United States–Israel Binational Agricultural Research and Development Fund (BARD) has enabled researchers at the University of California, Davis, and the University of Haifa in Israel to clone a gene from wild wheat that increases the protein, zinc, and iron content in the grain. The cloned gene offers a potential solution to nutritional deficiencies affecting hundreds of millions of people around the world.

"As a major crop across the globe, providing 20 percent of all calories consumed by humans, any improvement in the nutritional value of wheat would have substantial health benefits for much of the world's population," said USDA Undersecretary for Research, Education, and Economics Gale Buchanan.

Jorge Dubcovsky at UC Davis and Tzion Fahima at the University of Haifa designated the cloned gene GPC-B1 for its effect on grain protein content. GPC-B1 accelerates grain maturity and increases grain protein and micronutrient content by 10% to 15% in the wheat varieties studied so far.

To prove that all these effects were produced by this gene, the researchers created genetically modified wheat lines with reduced levels of the GPC gene. These lines were developed by ASPB member **Ann E. Blechl** of the USDA's Agricultural Research Service (ARS) in Albany, California. The grains from the genetically modified plants matured several weeks later than the control plants and showed 30% less grain protein, zinc, and iron, confirming that the GPC gene was responsible for the changes. Blechl used a technique called RNA interference to lower the gene's expression levels in wheat plants.

The researchers also found that all commercial pasta and bread wheat varieties analyzed so far have a nonfunctional copy of the GPC gene, suggesting that the gene was lost during the domestication of wheat. Reintroducing the functional gene into commercial wheat varieties could increase their nutritional value.

Today, nearly all Americans eat enough protein for good health, but more than 36 million of us don't get enough zinc, and more than 15 million are short on iron. The wheat research, by enriching the nutrients in one of the world's leading crops, holds the potential to improve Americans' health and the health of millions of the world's malnourished people.

The project received partial funding from the USDA's Cooperative State Research, Education and Extension Service's National Research Initiative. Results from the study were reported in the November 24, 2006, issue of *Science.*

Guerinot's Discovery on How Seed Storage of Iron Could Benefit Human Health and Crop Production

Findings address worldwide iron deficiency and malnutrition

Biologists have learned where and how some plant seeds store iron, a valuable discovery for scientists working to improve the iron content of plants. Their research helps address the worldwide problem of iron deficiency and malnutrition in humans.

A team led by ASPB member **Mary Lou Guerinot,** a biologist at Dartmouth College in New Hampshire, found that iron is stored in the developing vascular system of the seed of Arabidopsis, a model plant used in research. In particular, iron is stored in the vacuole, a plant cell's central storage site. The researchers also learned that this localization depends on a protein called VIT1, known to transport iron into the vacuole.

"Iron deficiency is the most common human nutritional disorder in the world today, afflicting more than 3 billion people worldwide," said Guerinot. "Most of these people rely on plants for their dietary iron, but plants are not high in iron, and the limited availability of iron in the soil can limit plant growth. Our study suggests that iron storage in the vacuole is a promising and, before now, largely unexplored target for increasing the iron content of seeds. Such

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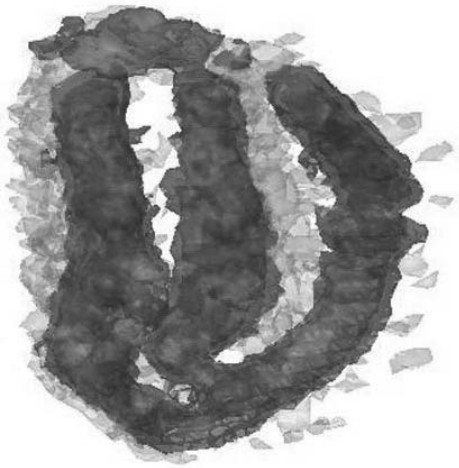


This image shows where iron (dark) and manganese (light) are found in a seed. Photo credit: Dartmouth College.

NCSB Soybean Genome Mapping Facility Opens

Senator Christopher Bond (R-MO), **Congressman Kenny Hulshof** (R-MO), and then-**Senator Jim Talent** (R-MO) joined with ASPB members at the University of Missouri (MU) and the Missouri Soybean Association (MSA) October 2 in a ceremony marking the opening of the Soybean Genome Mapping Facility. The facility is an expansion of the National Center for Soybean Biotechnology (NCSB) at MU in Columbia.

Renovations were supported by Senator Bond and his colleagues and by the MU College of Agriculture, Food and Natural Resources for the crop genomics laboratories in the Agriculture Building. Directors of the NCSB are ASPB members **Henry Nguyen, Gary Stacey** (chair of the ASPB Committee on Public Affairs), and **David Sleper.**

MU–Columbia was recently designated by Congress as the site for the NCSB. Its foundation was the Center for Soybean Genomics and Biotechnology, previously formed at MU in support of interdisciplinary research on the genomic structure and function of soybean genes. The ultimate goal of the NCSB is to provide innovative molecular approaches that can be applied toward soybean improvement.

The NCSB is a collaborative program among scientists at MU, the U.S. Department of Agriculture's Agricultural Research Service Plant Genetics Unit in Columbia, and the Donald Danforth Plant Science Center in St. Louis. The NCSB aims to foster research partnerships with institutions in the midwestern and southern states, where soybeans are a major crop.

The opening of the Soybean Genome Mapping Facility at the National Center for Soybean Biotechnology at the University of Missouri, Columbia, was celebrated with a ceremony October 2 in which Senator Christopher Bond (R-MO) did the ribbon cutting, together with Senator Jim Talent (R-MO) and Congressman Kenny Hulshof (R-MO). Left to right: Prof. David Sleper (associate director, National Center for Soybean Biotechnology), Dale Ludwig (CEO, Missouri Soybean Association), Brady Deaton (chancellor, MU), Senator Talent, Prof. Henry Nguyen (director, NCSB), Senator Bond, Congressman Hulshof, Elson Floyd (president, MU), Prof. Gary Stacey (associate director, NCSB and ASPB Committee on Public Affairs chair), and Tom Payne (vice chancellor and dean, College of Agriculture, Food and Natural Resources).

Congressman Kenny Hulshof (R-MO; second from left) was recognized for his support of plant research at the October 2 ceremony marking the opening of the Soybean Genome Mapping Facility at MU. Congratulating him from left are Professors Gary Stacey, Henry Nguyen, and David Sleper.

Senator Christopher Bond (R-MO) (second from right), who has championed support for plant science in Congress together with Senator Talent and Congressman Hulshof, was honored October 2 at the MU National Center for Soybean Biotechnology. Senator Bond is accepting congratulations from (from left) Professors Gary Stacey, Henry Nguyen, and David Sleper.

Chory's USDA–NRI Research on Plant Steroids Will Lead to Improved Crops


Joanne Chory

Plant steroids play an essential role in plant growth and development and provide stress protection. Scientists at the Salk Institute for Biological Studies in La Jolla, California, and the Howard Hughes Medical Institute, Chevy Chase, Maryland, are unlocking the mysteries of plant steroids and plant growth. Their research, funded by USDA, could lead to new plant varieties with desirable growth traits, USDA's Cooperative State Research, Education and Extension Service (CSREES) said in a news release November 9.

ASPB member **Joanne Chory** and colleagues identified a new protein that stops the growth process in plants when there is an absence of brassinosteroids, a type of plant steroid. These steroids induce a signaling mechanism in plant cells that flips a proverbial switch causing the plant to grow and develop properly.

For a signal to be transmitted to a plant cell, brassinosteroids attach to a receptor on the plasma membrane of the cell like a lock-and-key mechanism. The brassinosteroid receptor on the plasma membrane is called BRI1. Once BRI1 is activated by brassinosteroid binding, it interacts with BAK, a co-receptor that continues the reception chain.

In the absence of brassinosteroids, BRI1 kinase binds with the newly identified protein, BKI1, instead of BAK, shutting down the receptor and stopping the signal. This stunts growth and produces mutant dwarf plants.

During testing, the researchers found that reintroducing brassinosteroids into the system causes BRI1 to bind to the brassinosteroid, and BKI1 rapidly dissociates from the plasma membrane. The reception chain continues from there, and normal growth resumes.

BKI1-like genes are present in many plant species, including economically important crops such as rice, maize, and soybean. Over- or underexpression of BKI1 in these species will provide a valuable tool to control the strength of brassinosteroid signaling in plant cells and will allow the creation of novel plant varieties with desirable traits.

This research was published in the August 25, 2006, issue of *Science* in the article titled "Brassinosteroids Regulate Dissociation of BKI1, a Negative Regulator of BRI1 Signaling, from the Plasma Membrane."

CSREES funded this research project through the National Research Initiative (NRI) Genetic Processes and Mechanisms of Agricultural Plants Program. The NRI is the largest peer-reviewed, competitive grants program in CSREES. It supports research, education, and extension grants that address key problems of national, regional, and multistate importance in sustaining all components of agriculture.

Guerinot's Discovery
continued from page 23

nutrient-rich seeds would benefit both human health and agricultural productivity."

The findings were published online in the November 2, 2006, edition of *ScienceExpress,* the advance publication site for the journal *Science.*

The researchers combined traditional mutant analysis (turning on and off the VIT1 protein) with a powerful x-ray imaging technique to create a map of where iron is localized in the seed. Guerinot was surprised by the finding, because most studies on iron storage focus on another protein called ferritin.

"This project is a wonderful example of the power of using new combinations of tools—in this case, genetics and high-resolution three-dimensional x-ray fluorescence imaging—to understand gene function," said **Jane Silverthorne,** a program director in the National Science Foundation's Division of Biological Infrastructure, which funded the research. "The discovery that iron localizes in specific parts of a seed opens the possibility of developing seed crops such as grains and beans with increased content of this important nutrient."

The findings reveal how essential it is to look beyond ferritin to understand how plants store iron. The researchers say the stored iron in the vacuole is a key source of iron for developing seedlings. Seedlings that do not express the VIT1 protein grow poorly when iron is limited.

In addition to funding from the National Science Foundation, the study also was supported by the National Institutes of Health. The imaging was carried out at the Department of Energy's National Synchrotron Light Source at Brookhaven National Laboratory.

Other authors of the paper include **Sun A. Kim** and **Tracy Punshon,** both of Dartmouth; **Antonio Lanzirotti** of the University of Chicago; **Liangtao Li** and **Jerry Kaplan** of the University of Utah School of Medicine; **José Alonso** of North Carolina State University; and **Joseph Ecker** of the Salk Institute for Biological Studies. Guerinot is past president of ASPB.

ASPB's Presence at the NABT Convention in Albuquerque

"Whose exhibit booth is that?" was the question asked by many National Association of Biology Teachers (NABT) convention attendees and exhibitors. It was ours! **Paul** and **Coe Williams** had worked their magic with plants once again! Our booth was the hit of the exhibit hall with middle school life science teachers, high school biology teachers, and college/university professors wanting to partake in the activities and handouts provided by the Williamses and ASPB.

This was the first time ASPB sponsored an exhibit booth at NABT's annual convention. This year the convention was held in Albuquerque, New Mexico, from October 11 through 14. Education Committee member **Jane Ellis** and Paul and Coe Williams organized and worked in the booth during the convention. Paul and Coe had teachers making such things as lilliput gardens and magnifying lenses. They handed out instructions for these projects and for new fast plant and bottle biology activities.

Coe Williams (facing camera), Paul Williams, and Education Committee member Jane Ellis staff the popular ASPB Education Booth at the NABT Annual Convention.

Janice Haldeman, biology professor emeritus from Erskine College, was a major contributor to the booth. She has published many inquiry-based, hands-on articles on plants for biology teachers. Some of these articles and others developed with Jane Ellis were given out to teachers, along with Ziploc® bags containing materials for teachers to use in performing the experiments.

Other handouts that were teacher favorites included the "How Many Plants Does It Take to Make a Hamburger?" article and bookmarks. Our material printed in Spanish was greatly appreciated. We would like to thank all those responsible for helping make this exhibit possible.

Jane Ellis
Presbyterian College
jellis@mail.presby.edu

Rabson Donation Supports Education Foundation Programs

Executive Director **Crispin Taylor** and Education Foundation Chair **Jim Siedow** would like to express their gratitude to **Robert** and **Eileen Rabson** for their generous donation of stock. The donation directly benefits ASPB's Education Foundation, which advocates public understanding of plant science and its benefits to human welfare.

"We wanted to set an example and encourage others to do the same," said Eileen Rabson. "It's important that people support these programs."

Bob Rabson is former head of the Energy Biosciences program at the Department of Energy. Bob and Eileen's philanthropic work also includes creating and endowing the Barbara McClintock Award at Cornell University. The annual award, worth $2,000, is given to a graduate student "with the best potential and greatest background merit" in the plant sciences.

For information on how to make a stock or other donation to the Education Foundation, go to www.aspb.org/education/foundation.

John B. "Jack" Hanson

Jack Hanson's major contributions to plant biology were in the areas of the herbicidal effect of the synthetic auxin 2,4-D, the properties of plant mitochondria, and the energetics of ion uptake and calcium signaling by roots, as well as in the training of countless graduate students and postdocs in whom he instilled a love of plant physiology research and teaching. He died October 23, 2006.

Jack's Formative Years in the West

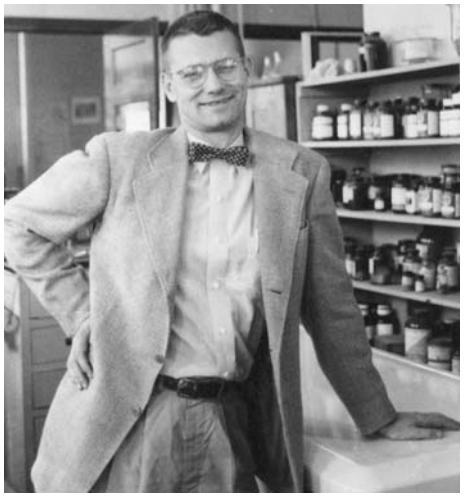
Jack was born March 24, 1918, in Denver, the first child of immigrant parents who settled in the tiny town of Hereford on the western windswept plains of Colorado. His coming of age during the Depression in poor farming country left its mark: He believed in hard work and loved cowboy songs of the West. After finishing high school in 1935, he enrolled at the University of Colorado at Boulder, having been awarded a full academic scholarship and helped by a $50 loan from a well-to-do rancher. The Depression came, the money ran out, and Jack had to interrupt his studies after one year.

In 1940 he joined the U.S. Army, barely passing the physical because he was so scrawny. In 1943 he married Becky Hanson, his lifelong companion, just before being shipped overseas. He saw action in North Africa and Sicily and was cited for bravery.

Like many of his contemporaries, he used the GI Bill to continue his studies and reentered the University of Colorado in 1945 as a sophomore at age 26. Life was tough, and he and Becky did menial jobs to make ends meet. A significant event at this time was his purchase of a guitar. Finally Jack could start strumming the cowboy songs he so loved. Subsequently he obtained his master's and PhD degrees with Orlin Biddulph at the State College of Washington (now WSU) in Pullman on ion uptake by roots and then in 1952–1953 did postdoc work with James Bonner at Caltech with an NRC postdoctoral fellowship.

At the Department of Agronomy of the University of Illinois

A year of research at Caltech, one of the few places in the country where plant biology



Jack Hanson as a young professor in the laboratory in Davenport Hall.

was considered to be "hot," landed him a job in the Department of Agronomy at the University of Illinois (at Urbana–Champaign [UIUC], as it is now called). The head of that department was unusually forward looking and wanted to hire a few faculty not just "to grow (crop) plants" but to study "how plants grow." In 1953, Jack was 35 and already had a family, and this was his first real job. The West still tugged at his heartstrings, but he stayed in Urbana. His guitar kept him company and was his link to his youth in the West. That same year, Richard "Dick" Hageman was hired to study how crops grow. Jack and Dick were given one very large lab to share in Davenport Hall. The first order of business was to clean out the lab, paint the walls and the benches, build a plant growth chamber, and get ready for research. (Start-up funds? You must be kidding!)

But what to work on? How *do* plants grow, and what determines their growth? In 1953 Millerd and Bonner had isolated active plant mitochondria for the first time, and the biochemistry and activities of mitochondria remained a major research strand in Jack's lab for many years. The problems of isolating mitochondria active in oxidative phosphorylation from various plant organs (roots, shoots, scutellum) bedeviled many a graduate student. Jack gained a strong reputation in understanding how ion uptake is coupled with oxidative phosphorylation, and his lab produced several mitochondriacs. In 1980, Jack and David Day, who had come from Australia to work with Jack, wrote the chapter on plant mitochondria for the eight-volume *The Biochemistry of Plants,* published by Academic Press.

Auxin and its role in plant growth was, of course, *the* hot topic at Caltech when Jack was there as a postdoc. That nucleic acids may play a role in auxin action was being hinted at in the late 1950s and early 1960s, and this became a major subject in Jack's lab. Being in an agronomy department, he focused on the herbicide 2,4-D, a synthetic auxin. He showed that 2,4-D had a differential effect on meristematic and more mature tissues and that it induced RNA accumulation and the machinery for RNA synthesis, major contributions from this research strand. Jack also had an interest in cell growth (without 2,4-D), and I worked with him on changes in organelles during cell elongation.

Department of Botany at UIUC and Research on Calcium Signaling

In 1967 Jack moved across the street to become the head of the Department of Botany, later renamed Plant Biology, where his infectious enthusiasm and measured approach brought renewal. He remained head until 1975. As faculty retired, he hired new faculty, including Charles Arntzen, John Boyer, Fred Meins, Larry Vanderhoef, and Carol Shearer, the first female faculty member in the Botany Department. In 10 years, Jack built an excellent plant biochemistry and physiology group while keeping traditional botany disciplines strong.

His research interest turned more toward the energetics of ion uptake by roots and specifically the role of calcium. Because of his work on mitochondria and his familiarity with the Mitchell hypothesis, Jack was one of the first to understand and work on the role of an electron motive force in the uptake of ions by roots. Jack's lab found that physical stress or mild injury of a root dramatically decreased its capacity for ion uptake caused by the collapse of the proton pump. The roots became leaky as a result of the opening of ion channels. However, upon incubation,

continued on next page

the roots recovered. Shock, they found, caused a rapid influx of calcium. How all these events are linked in the cell became the focus of Jack's work.

In 1980 he published a widely used review on plant mineral nutrition with David Clarkson in the *Annual Review of Plant Physiology.* In his 32 years at UIUC, Jack trained 27 PhD students and 17 postdocs; his lab also hosted nine visiting professors.

Recognition by and Service to ASPP

Jack was highly committed to plant physiology, the discipline he loved, and to serving it. He served ASPP in different capacities, including as president-elect in 1972–1973 and as president in 1973–1974. In 1980 he received the Charles Reid Barnes Life Membership Award and in 1989 the Adolph E. Gude Award with an unusual citation: "for contributing time, expertise, and wisdom to ASPP." While serving as president, Jack noticed that the (more sensible) practices at headquarters did not conform to the bylaws. What to do? Jack, being a practical man, decided to rewrite the bylaws and shepherd their adoption through the appropriate committees and the membership. When the Society found itself without an executive director in 1985, Jack took up the challenge, and immediately after his retirement from UIUC, he moved to Gaithersburg, Maryland, for six months to become the interim executive director. While there, he realized the gap in our knowledge about the history of ASPP and took it upon himself to document this history, helped enormously by his wife Becky. The resulting 277-page book was published by ASPP in 1989. He interviewed numerous people and was able to document the entire history starting in 1923–1924. Going to Washington DC for 6 months on behalf of the ASPP came easily to the Hansons, because they were no strangers to the Capital. Earlier in Jack's career, he had made time to spend a year there, working for the Atomic Energy Commission, which was then undergoing its transformation to the Energy Research and Development Administration, later becoming the Department of Energy.

Boundless Love for Teaching and Research

When asked what Jack contributed to their careers, his numerous former associates are quite unanimous: his love of science, his enthusiasm for the next experiment, his focus on asking the right question, his love of teaching (always by example), and his setting of clear standards. You always knew when you measured up and when you didn't. All, especially those from abroad, remembered fondly being made part of the Hanson family and experiencing the warm hospitality Jack, Becky, and their three daughters provided.

Jack was an active collector of antique clocks, and his house was full of them. In retirement he continued to tinker with his clocks, and he also continued his singing "career." For 15 years he and Becky led sing-alongs at the Urbana County nursing home. He composed songs as well—one of them for Dick Hageman's retirement on the subject of nitrogen—and published two books of children's songs.

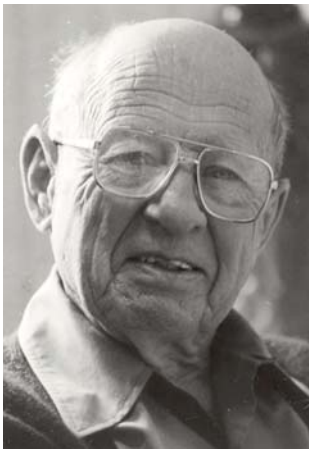
Jack was an optimist who worked hard and was persistent. He had to be, considering the conditions where he started in Colorado. Those of us who worked with him remember the parties organized by Becky. Invariably Jack could be convinced to take out his guitar and sing "Old Dan Tucker," "I Wish I Was Single Again," and other melancholy cowboy ballads. Jack represents plant biology in a different age: more gentle, less competitive, but not less demanding of excellence. We remember him fondly.

The Hanson family has set up a fund to help students from disadvantaged rural backgrounds, as Jack was. If you want to contribute, send a check to the UIUC Foundation (1305 West Green Street, Urbana, IL 61801-2962) and mark it John B. Hanson Memorial Fund.

Maarten J. Chrispeels
La Jolla, California

Jack Myers

Jack Edgar Myers, whose career featured the unusual combination of serving science education and research and serving children as science editor of *Highlights* magazine, died of cancer on December 28 in his Austin, Texas, apartment at Westminster Manor. He was 93.


Jack Myers

Myers, named to the prestigious National Academy of Sciences in 1975, earned numerous other honors for contributing to the understanding of photosynthesis, phototrophic growth, and the physiology of algae, including the Charles F. Kettering Award from the American Society of Plant Physiologists. In the presentation of the Kettering Award, Myers's wide influence on the field was emphasized, along with recognition that his "career shows in an exemplary manner how wide- ranging scientific achievement can be combined with humanism, modesty, and wisdom." In 1998, the American Society of Gravitational and Space Biology awarded Myers its highest honor, the Founders Award, for his seminal work providing the foundation for practical applications of algae as a source of food in the closed environments needed for space exploration.

Following his appointment to the University of Texas faculty in 1941, he spent 58 years there, taking emeritus status in 1980 but continuing to occupy his lab and actively conduct research until 1999. He authored more than 100 papers for scientific journals and publications.

Myers called himself lucky for being able to "work as a scientist . . . there was always another challenge, because there was always another question."

That approach and a devotion to the scientific process guided Myers's work at Highlights for Children, Inc., an educational publishing company founded 60 years ago by his parents, Garry Cleveland Myers and Caroline Clark Myers. Writing for children, Jack Myers later recalled, was "a challenge I hadn't counted on, but my Pop was of a mind that, 'You can do this. You're a scientist, aren't you?'"

His duties as science editor began in 1958. In search of authors, he sought out scientists "who have a great insight into their subjects. The limitation is that it is hard to find people who will write in the language that kids will find sufficiently easy to be interesting." In a typical reaction to a submitted piece, he once wrote, "I think the author was trying to teach about a tidal marsh—not tell a story and make it an exciting place. . . . If we're going to have a 'muddy adventure,' something has to happen. And we really can't have an adventure if we must catalog all the kinds of things that can happen in a marsh."

Highlights magazine editor Christine French Clark noted that "Uncle Jack," as everyone at the magazine office called him, had everyone's "great respect as a scientist and an editor and a writer who speaks to kids in a very honest, forthright way.

As part of his *Highlights* job, Myers responded to as many as 400 letters a year from young readers who asked him virtually everything from the difference between frogs and toads to why human skin wrinkles in water. His answers often were disarming. When a child asked why "every dog I know goes around and around in circles before lying down," Myers answered, "I have heard the idea that the circling . . . is a behavior inherited from wild ancestors. That sounds reasonable enough, though I cannot be sure it is the best explanation. If you find a better explanation, please let me know."

For Myers, science was "the search for understanding of our world. All the fun and excitement is in the search. That's where the action is." He decried the teaching of science "as a collection of facts. . . .When it becomes a bunch of facts, it is a sterile and rather unexciting subject. But the real fact is that science is an open-ended endeavor and never deals in certainty. Kids do not get much exposure to how we know. I think it makes science a lot more fun, and it does a lot more useful service for *Highlights* to treat the question: How do you find something out?"

Jack Myers was born on July 10, 1913, in Boyd's Mills, Pennsylvania, one of three children. He recalled having been a "mediocre student" until ninth grade, when he was "fired up" by his teachers of English, mathematics, and general science, the last having had, in Myers's words, "a remarkable ability to stimulate real interest in science among his students."

Myers attended Juniata College in Huntingdon, Pennsylvania, for his undergraduate work, which included a major in chemistry. He earned a master's degree in 1935 from Montana State University and then chose the University of Minnesota for his doctoral work, concentrating on plant photosynthesis and achieving his degree status in 1939.

He had chosen Minnesota in part because Evelyn De Turck, a friend from undergraduate days, had taken a job in Minneapolis, with plans to do graduate studies at the university. "By 1937," said Myers, "we decided to get married. We pooled our incomes. Mine was $66 a month, and hers was $33. Depression days! You could do it then on that amount of money." They had four daughters, and Jack was devoted to his wife and children. Mrs. Myers died in 1997.

In 1960, when his younger brother, Garry Cleveland Myers, Jr., and his wife Mary died in a plane crash, Jack, Evelyn, and their daughters expanded their family to include five additional children. Garry Myers, Jr., had been the senior business executive of Highlights for Children, Inc., from 1949 until his death. As a result of this tragedy, Jack Myers stepped into a leadership role on the Highlights corporate board of directors. He served as a mentor to his nephews, including Garry Cleveland Myers III, a long-time executive who was CEO of Highlights for Children from 1981 until his death in 2005, and Kent L. Brown, Jr., who started in the editorial offices in 1971 and is now editor-in-chief, as well as to his grandnephew, Kent S. Johnson, who is the current CEO of the company. Myers's influence extended to four generations of the entire Myers family: He combined a great sense of humor, personal ethics, wisdom, humility, and soft-spoken thoughtfulness to lead through inter-generational transitions, always nurturing a strong commitment to family unity and to stewardship of the Highlights corporation.

In 1939 Myers was awarded a National Research Council postdoctoral fellowship and joined the staff of the Smithsonian Institution in Washington, DC, to concentrate on his studies in photosynthesis.

The University of Texas recruited him in 1941 as an assistant professor of zoology. Promotions followed, to associate professor in 1946 and professor in 1948. In 1956, his title expanded to professor of botany and zoology. During his years at the University of Texas, he earned honors for teaching and, in 1959, won a Guggenheim Fellowship.

In 1993, the College of Natural Sciences at the University of Texas named Myers to its Hall of Honor. A colleague wrote, "Jack Myers has been, and continues to be, a true hands-on research scientist—a molecular biologist 50 years before this discipline became a recognizable field of research. He is the consummate faculty member in the best sense of the word, and one who has a pure interest in the learning enjoyed by others as well as by himself." In 2006, Norman Hackerman, chemistry professor emeritus and former president of the University of Texas at Austin, described Myers "as a pure scientist, very interested in understanding nature better—and he was a good guy besides."

Along with his academic papers and the countless articles he wrote for *Highlights,* Myers published a number of books that focused on young readers and the scientific process, including *Can Birds Get Lost? What Makes Popcorn Pop?* and *What Happened to the Mammoths?*

In the 1990s, Myers devoted considerable time to training, inspiring, and mentoring young science and nature writers with an interest in writing for children. Much of that work was done at the annual conferences of

continued on next page

the Highlights Foundation Writers Workshop held in Chautauqua, New York.

Myers is survived by his four daughters and their husbands: Shirley and Fred Wendlandt of Mullin, Texas; Jacquelyn and Jim Leonard of Lakeway, Texas; Linda and Allan Anderson of Ashland, Oregon; and Kathleen and Steve Holland of Spicewood, Texas, as well as by 10 grandchildren and seven great-grandchildren. He also is survived by four of his brother's five children and their spouses: Tom Myers of Austin; Fred and Jennifer Myers of Austin; Patricia and John Mikelson of Columbus, Ohio; and Marie Jolene Rich of Portland, Maine, as well as by their six children and six grandchildren.

In lieu of flowers, contributions in the memory of Jack Myers may be sent to the Jack Myers Scholarship Fund, Highlights Foundation, 814 Court Street, Honesdale, PA 18431 or to Hospice Austin, 4107 Spicewood Springs Road, Suite 100, Austin, TX 78759.

Donald N. Duvick

Donald N. Duvick, 81, of Johnston, Iowa, died Tuesday, May 23, 2006, at Mercy Hospice in Johnston after a brief illness. Donald was born in Sandwich, Illinois, on December 18, 1924, the eldest son of Florence (Appel) and Nelson Duvick. He grew up on a dairy farm and attended Sandy Bluff Elementary School and the Sandwich Schools. After serving in the U.S. Army in World War II in the European theater, he received a BS in agriculture from the University of Illinois in 1948 and earned a PhD in botany and genetics from Washington University (St. Louis) in 1951.

In 1950 he married Selma Nelson, of Palmerton, Pennsylvania, with whom he had two sons, Daniel and Jonathan, and a daughter, Randa.

In 1951, Don began his career with Pioneer Hi-Bred International Inc. He held a number of positions at Pioneer, including geneticist/corn breeder, director of plant breeding, and finally senior vice president for research, the position he held on his retirement in 1990.

After retirement, he was appointed affiliate professor of plant breeding at Iowa State University, a position he held until his death. Don was active in global agriculture affairs, particularly in the areas of plant breeding methods, germplasm conservation, and intellectual property. He also continued to carry out field research that significantly advanced a genetic understanding of the role that plant breeders have played in improving the productivity of corn during the history of corn hybrid agriculture from the 1930s to today.

Don was a member of the National Academy of Sciences and a distinguished fellow of the Iowa Academy of Science. He was a fellow of the American Association for the Advancement of Science, the American Society of Agronomy, and the Crop Science Society of America. In 2006 he received the President's Award from the Crop Science Society and was posthumously recognized by a special issue of the journal *MAYDICA*.

Throughout his career, he held numerous offices in scientific societies, including as president of the Crop Science Society, the American Society of Agronomy, and the National Council of Plant Breeders. He also served as trustee for the International Rice Research Institute in the Philippines and for the International Maize and Wheat Improvement Center in Mexico. He served on a number of advisory boards through the years, including the National Research Council, the National Germplasm Resources Board, and the McKnight Foundation's Collaborative Crop Research Program. He published widely on plant genetic resources, hybrid improvement, and plant breeding.

Don's public service also included membership in and service on the board of the Nature Conservancy of Iowa (1982–2005), from whom he received a Distinguished Service Award. He served on the committee of World War II veterans that was responsible for the creation of the World War II memorial on the grounds of the Iowa capitol. Don was active in the Johnston Historical Society and served his church, the Urbandale United Church of Christ, in a number of capacities over the years, including more than 50 years in the choir. He had many interests, including vocal and instrumental music, conservation, prairie restoration, field botany, history, literature, and gardening.

Don is survived by his wife Selma, sons Daniel (and wife Susan) of rural Madrid, Iowa, and Jonathan (and wife Carol Hendrick) of Des Moines; daughter Randa (and husband David Grosnick) of Valparaiso, Indiana; and grandchildren Alex and Makenzie Duvick. His brothers Jack (and wife Darlene) of Tipton, Indiana; Edward of Sandwich, Illinois; and Richard (and wife Donna) of Worthington, Ohio, also survive.

This article was contributed by Jon Duvick and Stephen Smith.

Plant Biology & Botany

2007 JOINT CONGRESS

American Fern Society
American Society of Plant Biologists
American Society of Plant Taxonomists
Botanical Society of America

For more information contact the
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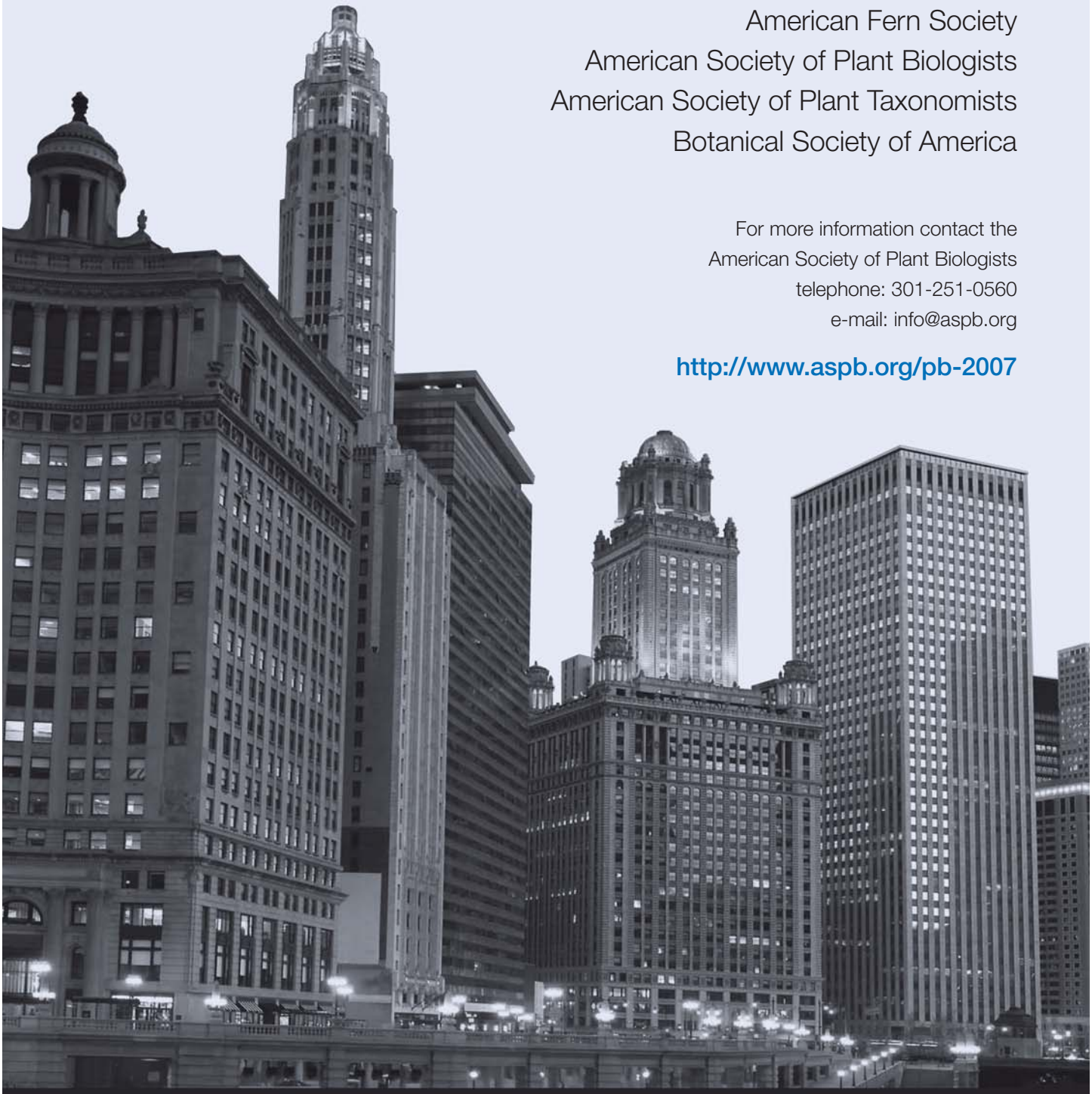
http://www.aspb.org/pb-2007



JULY 7 THROUGH JULY 11, 2007

HILTON CHICAGO, CHICAGO, ILLINOIS

ASPB Headquarters

For your convenience, keep this listing of extension numbers and e-mail addresses handy when you contact ASPB headquarters so that you can reach the person best able to assist you.

● Our office telephone number is 301-251-0560

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