



NEWSLETTER

American Society of Plant Physiologists

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SIEDOW SEES "EXCITING, UNCERTAIN TIMES" FOR ASPP

Outgoing President Cites Urgent Need for Member Involvement

I would like to use my final president's letter to review the state of the American Society of Plant Physiologists as I prepare to leave the office of president. I have served on the executive committee of the Society for the past nine years, and I never cease to be amazed at the extent to which ASPP, which often gets rapped for being a stodgy outfit, is, more often than not, operating at the leading edge. When molecular biology began to make its presence felt in the scientific world, our members rapidly applied those tools to questions which had long resisted answer using classical physiological and biochemical approaches.

Further, the need to embrace this new field was recognized by people such as Joe Varner and Charlie Arntzen, among others, who pushed the Society to tackle the ambitious task of initiating a purely plant-based journal that would attract the best papers in the area of plant molecular biology. I need not dwell on how successful THE PLANT CELL has been in accomplishing that goal. Even with competition coming from journals that have copied our formula, the Society can take pride in the fact that in *Plant Physiology* and THE PLANT CELL, we publish the two

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Rosannah Taylor, center, a former student of the late Joe Varner, demonstrates tissue printing, a technique reinvented by Varner, at a workshop conducted at the 1995 ASPP annual meeting in Charlotte, North Carolina. (See obituary for Varner on page 5.)

Deadline for the
November/December 1995 issue
of the ASPP Newsletter
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best journals in the world covering the overall field of experimental plant biology. Through the efforts of editors Maarten Chrispeels and Brian Larkins, I have no doubt that both journals will continue to grow, evolve, and improve.

The future of our journals is bright but it is not without its caveats. I need not explain the extent to which the world of scientific publications is undergoing wholesale change due to the ongoing revolution in communications. ASPP needs to be attuned to the changes taking place in this environment. The leadership of Maarten Chrispeels in converting the Plant Gene Register section of *Plant Physiology* to an electronic format has already started us down this road. We are not a large enough organization to serve as a true beta test site for an electronic journal, but do we need to be in a position to act quickly as changes take place in this rapidly moving arena. Our publications staff has been monitoring these changes, but in order to help them keep abreast of the changes and to facilitate thinking about how the Society can best adapt as change is needed—and it *will* be needed—I have set up an ad hoc subcommittee on electronic publications. This subcommittee of the publications committee is charged with monitoring the field of electronic publications and making appropriate recommendations to the publications committee in that regard. Our journal situation is solid, but "the times they are a-changin'" as a famous poet of my era who couldn't sing a lick once said. It is imperative that in the future, as in the past, ASPP continue to change with those times.

I would also like to point out the many strides that our executive director, Ken Beam, has made in improving the administrative structure at ASPP headquarters. These advances include streamlining the organizing and running of the annual meeting and instituting a specific position at headquarters devoted to member services. Most important, while the number of headquarters staff has increased by only two in the two years Ken has been in his position, not only have services been enhanced, but also significant reductions have been achieved in the total administrative costs associated with running headquarters. These economies have allowed the Society over the past two years to fully pay off the debt we carried



Jim Siedow, 1994-1995 ASPP president, calls to order the 1995 ASPP annual meeting.

since we initiated both *THE PLANT CELL* and a series of editorial changes in *Plant Physiology*. This is quite an achievement and one that puts the Society on firm financial footing as we face the many challenges that lie ahead.

Let's focus briefly on another success story in the making. Throughout most of my years on the executive committee, we grappled with the question of how to position the ASPP in the arena of public affairs. Successful ad hoc efforts focusing on specific federal programs had been organized by some ASPP members, but the Society itself had no real program in public affairs. Beginning three years ago, through the leadership of two past presidents, Mary Helen Goldsmith and Ralph Quatrano, ASPP moved to establish a permanent staff position to organize and coordinate ASPP's efforts in public affairs, and two years ago Brian Hyps was hired as the first director of public affairs. ASPP's nascent public affairs efforts have been quite successful, and it is not hyperbole to state that ASPP presently wears a mantle of leadership in the area of public affairs among plant science societies.

A glance at the public affairs section of recent ASPP newsletters spells out our efforts in organizing a program that includes systematic e-mail updates on legislative events of importance to the society, strategic phone calls and letters from home-district society members to key

congressmen, congressional testimony by Society members on plant science-related funding legislation, and ASPP input on draft legislation. Through Brian's efforts, ASPP is becoming known among Congressional staff members on Capitol Hill. I will not say this allows us to single-handedly influence the NSF or USDA-NRI budgets, because I know that isn't true. However, to the extent that ASPP is beginning to be listened to and people on Capitol Hill trust what ASPP tells them, we can, over the long haul, expect to have a positive effect.

Brian has not done it alone. We have called upon and will continue to call upon ASPP members to aid in this endeavor. Any member reading this newsletter interested in playing a role in public affairs, please make either Brian Hyps (bhyps@aspp.org) or Ralph Quatrano (rsq@unc.edu) aware of that fact; there are plenty of things to do. On the other hand, membership in ASPP alone makes you a member of the public affairs committee of the whole, and I strongly urge you to pay close attention to and respond to requests that come from Brian, the committee on public affairs, or the soon-to-be-extant ASPP World Wide Web homepage.

Also seeing spectacular growth in the past year are the efforts of the education committee. Chaired by Susan Singer, this committee responded to the call last year by president Russell Jones to make education a more central feature of the Society's efforts. The wide-ranging series of events sponsored by the education committee at the 1995 annual meeting is a testament to how hard the committee worked this past year. The education-related workshops were a huge success, if attendance and audience enthusiasm are good indicators, and the education committee booth was always the focus of considerable activity throughout the meeting. In addition, I urge each of you to get in the habit of reading the education forum section of the newsletter, which has grown considerably over the past year. Every issue will contain articles that will be of interest to anyone who teaches. As with public affairs, I see our efforts in the education arena growing in the future, and if you have an interest in participating, please notify Carl Pike, the incoming chair of the education committee.

With ASPP's movement into areas outside of its traditional involvement, it was not lost on those of us who worry about the Society's finances that these new en-

ASPP Officers and Staff

1994-1995 Officers

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Bob Buchanan (510-642-3590)

President-Elect

Donald Ort (217-333-2093)

Immediate Past President

James N. Siedow (919-684-6573)

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Kenneth Keegstra (517-353-2270)

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Wendy F. Boss (919-515-3496)

Sectional Representatives

Midwestern

Daniel R. Bush (217-333-6109)

Northeastern

Subhash Minocha (603-862-3840)

Southern

William H. Outlaw Jr. (904-644-4020)

Washington, DC

Jerry D. Cohen (301-504-5632)

Western

Terri Lomax (503-737-5278)

Headquarters Office

15501 Monona Drive

Rockville, MD 20855-2768 USA

Phone: 301-251-0560 • Fax: 301-279-2996

Executive director, Kenneth M. Beam, ext. 15

(e-mail kenbeam@aspp.org)

Director of finance and administration,

Susan K. Chambers, ext. 11

(e-mail chambers@aspp.org)

Accountant, Thomas M. Dushney, ext. 10

(e-mail tdushney@aspp.org)

Member services coordinator,

Sharon Y. Kelly, ext. 29

(e-mail skelly@aspp.org)

Receptionist, Estella Coley, ext. 22

(e-mail estcoley@aspp.org)

Mail room clerk, Marian Osuji, ext. 12

(e-mail mosuji@aspp.org)

Public affairs director, Brian M. Hysp, ext. 14

(e-mail bhysp@aspp.org)

Publications director, Jody Carlson, ext. 17

(e-mail jcarlson@aspp.org)

Publications assistant, Sylvia Braxton, ext. 33

(e-mail sbraxton@aspp.org)

Managing editor, *Plant Physiology*,

Deborah I. Weiner, ext. 18

(e-mail dweiner@aspp.org)

Managing editor, THE PLANT CELL,

Judith E. Grollman, ext. 19

(e-mail grollman@aspp.org)

News and Reviews editor, THE PLANT CELL,

Rebecca Chasan, ext. 21

(e-mail rchasan@aspp.org)

Senior production editor, *Plant Physiology*,

W. Mark Leader, ext. 23

(e-mail mleader@aspp.org)

Production editor, *Plant Physiology*,

Lauren Ransome, ext. 30

(e-mail lransome@aspp.org)

Production editor, THE PLANT CELL,

Catherine A. Balogh, ext. 16

(e-mail balogh@aspp.org)

Manuscript manager, Annette Kessler, ext. 20

(e-mail akessler@aspp.org)

Manuscript assistant, Kimberly A. Davis, ext. 24

(e-mail kimdavis@aspp.org)

Manuscript assistant, Aphrodite Knoop, ext. 25

(e-mail aknoop@aspp.org)

deavors cost money and that we cannot expect our already overtaxed libraries to foot the bill through their subscription dollars for our efforts in public affairs or education. Recognizing that dilemma, a proposal for a fundraising arm of the Society, an ASPP education foundation, was developed last year approved by the executive committee at the 1994 annual meeting in Portland. In this year's ASPP election, ASPP members recognized the importance of the foundation to the future well-being of ASPP and overwhelmingly approved its. For that vote I sincerely thank you. It represents the kind of forward-looking attitude that will keep this Society vibrant.

The success of the ASPP education foundation will depend on the efforts and generosity of many people, among whom will be the members of ASPP. When your membership renewal form appears later this year, there will be a line allowing you to earmark a specific contribution to the ASPP education foundation. All those who contribute this year will be permanently recognized at ASPP headquarters as founding donors to the ASPP education foundation. Here at Duke, the development people tell me that successfully raising money from sources outside your organization requires a strong show of support from members within the organization. Therefore, when you receive your membership renewal form, I ask you please to give and give generously so we can get the foundation off to a robust start.

I want to end this message with one more pitch that will not be a new one to those of you who read this column regularly. We are currently witnessing nothing less than a revolution in the federal government, one that has the potential to dramatically affect the practice of science in this country as we have come to know it. There is no question that tight funding times for both federally supported research grants and federal research institutions will be with us for some years to come. How bad the situation will be and for how long will depend a lot on how good a job the scientific community does of getting across to Congress and the American public the importance of science (both basic and applied) to the future economic health and well-being of the country. I am con-

vinced that science can get its fair share of the pie, even in times of severe budget cutting, but only if we, and by "we" I mean every member of this Society, recognize the need to make public outreach and education an integral part of our professional life, as important as making a transgenic construct or running an enzyme assay in the lab.

We can neither hold to the arrogant position that federal support of science is some sort of protected birthright nor expect that others will carry the ball for us in making the case to Congress and the public. We all must get more involved in educating the public at all levels—inculcating the importance of science generally and plant science specifically from kindergarten through postsecondary education, educating the larger public to the importance of science in an increasingly technology-based world, and continuing to press our case with Congress through our public affairs efforts.

This brings me full circle. These are both exciting and uncertain times for our Society. We are embarking on a whole host of endeavors that, in total, should help to solidify the position of plant sciences and ASPP into the next century. But they cannot happen without your personal involvement. The effort will be long term and will not be easy. When you are asked to serve the Society, serve, and serve with the same passion you would bring to your research or your teaching. This is an obligation that you cannot afford to abdicate; no less than the future health of our profession lies in the balance.

Finally, I want to thank you for giving me the opportunity to serve as ASPP president. It has been a most enjoyable and rewarding year, and I thank all of you who helped to make it so. Much has been accomplished, but much remains to be done. I leave the presidency taking heart in the fact that the Society is in excellent hands and, as a result, its future looks to be bright indeed.

James N. Siedow
ASPP President, 1994-1995
Duke University
jsiedow@acpub.duke.edu

OBITUARIES

Jerome A. Schiff

Jerome A. Schiff died in Weston, Massachusetts, on July 28, 1995, at the age of 64, after a long illness. At the time of his death he held the Abraham and Etta Goodman Chair in Biology at Brandeis University, Waltham, Massachusetts, and was chief editor of *Plant Science*.

Dr. Schiff dedicated most of his research career to studying the fresh water flagellate, *Euglena*, and the green alga, *Chlorella*, and made seminal contributions to our understanding of chloroplast development, organellar biology, and sulfur metabolism in algae. His research career spanned almost four decades and included over 165 publications and at least 20 major reviews.

Through a deep and sound knowledge of the nutritional requirements and physiological idiosyncrasies of *Euglena* and by taking advantage of the reversible nature of its plastid development, Jerry Schiff early on in his career established this organism as a model system to study chloroplast development in algae. He fully exploited the fact that under heterotrophic conditions, chloroplasts in *Euglena gracilis* are gratuitous for cell viability and growth and analyzed chloroplast development with a multiplicity of clever, thoughtful, and state-of-the-art approaches that included physiological, biochemical, molecular, photobiological, and ultrastructural studies. To acquire information from an organism that lacks sex, he investigated chloroplast biogenesis with wildtype and UV- and streptomycin-induced mutants under a variety of conditions for plastid development such as, growing (autotrophic), gratuitous (heterotrophic), resting (absence of cell division), and in DCMU (absence of functional photosynthesis).

Among the many important contributions from his laboratory and collaborations was the demonstration and characterization of *Euglena* chloroplast and mitochondrial DNA, UV inactivation and photoreactivation of chloroplast development, the action spectrum for chlorophyll synthesis [protochlorophyll(ide)], and the semiautonomous nature of chloroplast development in this organism. Also, his laboratory identified nuclear and chloroplast encoded proteins, and found a cryptochrome-like blue absorbing pigment that acts synergistically with

protochlorophyll(ide) to regulate expression of the nuclear and chloroplast genome. The structure of the *Euglena* proplastid was determined through serial sectioning and paramylon degradation was found to be under photocontrol. An exciting recent discovery was that, unlike plants, *Euglena* chloroplast proteins such as LHCP II apoprotein accumulate in the Golgi prior to their transport to the plastid.

Dr. Schiff's other major thrust in research, which began as a graduate student at the University of Pennsylvania in 1956, was the study of assimilatory sulfate reduction in eukaryotes using *Chlorella* and *Euglena*. Here, the chief contributions from his laboratory were the characterization of the initial steps in sulfate activation (formation of APS and the subsequent transfer of active sulfur); the discovery of two ATP sulfurylases in *Euglena* (one soluble and the other mitochondrial); the presence of a sulfate-metabolizing center outside of the inner mitochondrial membrane which can reduce sulfate to sulfite and cysteine and the subsequent conversion of cysteine to sulfolipid in the chloroplast; and more recently, the presence of a new class of sulfonic acid lipids in the *Euglena* mitochondrion, the taurolipids which contain conjugates of taurine. In recognition of his work in sulfur metabolism, the Proceedings of the Sulfur Workshop at Haren, The Netherlands, in 1989 were dedicated to him.

Thus, through a series of brilliantly conceived and meticulously performed, pacesetter studies, Dr. Schiff established a remarkable record of achievement in two important areas of algal research. The driving force was always the biological question, not the technique, and his findings formed the basis for continuing studies in these fields up to the present.

Jerry Schiff also distinguished himself in the service of our profession. He was a mentor to many successful students and postdoctoral fellows and for several summers taught courses in comparative biology and biochemistry of algae at the Marine Biological Laboratory in Woods Hole, Massachusetts. He served as director of the Experimental Marine Botany Program, MBL, summers from 1974-79. He also worked tirelessly for the benefit of various journals (*Plant Physiology*/assistant and advisory editor; *Developmental Biology*/consultant editor; *Plant Science Letters*/editorial board and associate editor; *Annual Review of Plant Physiology and*

Plant Molecular Biology/editorial committee; *Plant Science*/chief editor, 12 years). He also served as executive committee member, ASPP, and representative of the Northeast Section for sixteen years (1972-88) and received the Section's Distinguished Service Award in 1989.

Jerry was a man full of life and curiosity until the very end. He was an avid reader, a gourmand, and a lover of classical music. He took particular pride and delight in playing his custom-made harpsichord. In the days when the annual meetings were still held on campuses, I could always find Jerry between talks at the chapel playing the organ or piano. He had a keen sense of humor and loved a lively discussion on a variety of subjects including academia, science, and politics. He was very generous and giving, and I know he will be missed by all who have known him.

Arthur Stern
Department of Biology
University of Massachusetts, Amherst

Joseph E. Varner

"Get curious. Pick a tough problem and go to work."

Those were the final words Joe Varner wrote in his last article, "101 Reasons to Learn More Plant Biochemistry" (*Plant Cell* [1995] 7: 795-796) before he died at the age of 73 on July 4, 1995. Throughout his career, Joe was curious about a variety of phenomena in plants, and his love of science has been truly inspirational to his colleagues. Although Joe officially retired in 1992 and was the Charles Rebstock Professor emeritus at Washington University, retirement did not seem to change his life style or his appetite for work. He continued to read and experiment daily at the bench even after he was told that cancer had metastasized in his body.

Joseph E. Varner grew up on the family farm in Ohio and attended Ohio State University for both college and graduate training. As a chemistry major, his initial desire was to "find out what things are made of." However, while stationed in California with the Marine Corps during World War II, he discovered a book on physiological chemistry at the Santa Ana Public Library and eventually changed his career goal to "find out how plants work." His Ph.D. thesis work was about "How a CAM Plant Works" He continued to study plant metabolism in the 1950s. As an assistant professor at Ohio State, he was

particularly interested in the biosynthesis of nitrogenous compounds such as glutamine and asparagine and the involvement of molybdate, tungstate, and silicate in cellular metabolism. In his 1957 article in *Methods of Enzymology*, he summarized the chromatographic analyses of organic acids, which remained the standard technique in this field for many years.

In the late 1950s, Joe turned his attention to development and the role of metabolism and enzymes in cotyledon senescence, a process which he recognized early on as a manifestation of programmed cell death. From there it was but a small step to understanding the role of hormones in regulating enzyme synthesis. Using barley aleurone cells, Joe did two seminal experiments in the early 1960s. He showed that the application of a hormone (gibberellin) to a specific tissue (the aleurone layer) caused the appearance of new enzymes (α -amylase and others). By using the heavy isotope ^{18}O and isopycnic equilibrium centrifugation, he and Phil Filner proved unequivocally that all of the α -amylase was synthesized *de novo* in gibberellin-stimulated barley aleurone layers. This technique, pioneered by Joe Varner, of "density-labeling" proteins became a convenient tool to study enzyme synthesis without going through the laborious task of purifying the enzyme. These contributions have not only advanced our understanding of seedling physiology but also established cereal aleurone tissue as one of the best systems for investigating hormonal regulation of gene expression and protein secretion in plants.

Joe's work with the aleurone system started at the Research Institute for Advanced Sciences (RIAS) in Baltimore, Maryland, and continued when he became a professor at the then Atomic Energy Commission Plant Research Laboratory at Michigan State University. While at RIAS, he had strong interactions with the photosynthesis group headed by Bessel Kok and contributed to experiments designed to detect life in outer space using a mass spectrometer.

In the 1970s and after moving to Washington University in St. Louis, Joe's interest shifted to the study of cell walls. He followed an integrated approach to the problem, employing molecular, cellular, biochemical, and physical techniques. His lab was the first to clone the genes encoding hydroxyproline-rich glycoproteins

(extensins). The molecular information he uncovered has revealed important new insights into the structure, function, and regulation of synthesis of this group of cell wall proteins. To investigate the tissue-specific expression of various cell wall proteins, he and his colleagues reinvented and popularized the disarmingly simple "tissue printing" technique, which can be learned by high school students, yet is so powerful and versatile that it has appeared in numerous research articles. A monograph devoted to tissue printing has been published, and the American Society of Plant Physiologists has held at least two workshops on this technique at recent annual meetings.

Joe was a strong believer in serving the scientific community. Besides being on various review panels at NSF, USDA, and universities and foundations around the country, he was president of the American Society of Plant Physiologists in 1969-70 and of the Society for Developmental Biology. He was an associate editor for *Plant Physiology* from 1967 to 1983 and was a strong supporter of the American Society of Plant Physiologists and its two journals. He was the chief scientist at the USDA Competitive Research Grants Office where he initiated new programs to encourage young scientists to compete for research support. He was elected to the National Academy of Sciences and to the American Academy of Arts and Sciences.

The book *Plant Biochemistry*, which he edited with James Bonner, has been used as a popular reference and standard textbook for many years in many countries. With the idea to renew interest in plant biochemistry and to train future generations of plant biochemists, he was instrumental in getting support for an annual plant biochemistry training course, which has increased in popularity in the last four years. He was actively involved in planning a new plant biochemistry textbook until his untimely death.

Throughout his career, Joe Varner was an untiring champion of plant biology and was always looking at the horizon to see what the future might hold. To many younger scientists, a discussion with Joe was not just stimulating, it was also a phenomenon in learning and inspiration. Besides the graduate students, postdoctoral fellows, and sabbatical visitors who received training in his laboratory, Joe had a strong influence in the career of many others.

Joe's life instructs us to recognize that

we are enormously privileged to have the opportunity to contribute to understanding how plants work. Were he here, he would tell us to be quick to laugh and to be generous in spirit. He would tell us to find time to share ideas with colleagues and encourage them in their work and to be especially supportive of younger colleagues. But basically, he would tell us to have fun doing science. In a symposium held in his honor in April 1993 at Washington University, he stressed the notion that scientific inquiry is "brain candy." So it was for him, all his life.

A great scientist has passed away, but the legacy of Joe Varner lives on in the laboratories of the younger scientists he inspired, in the classrooms of the high school teachers he trained, in the techniques he developed, and in the institutions he helped to establish.

Tuan-hua David Ho
Washington University, St. Louis,
Missouri

Maarten J. Chrispeels
University of California at San Diego

The Alexander von Humboldt Foundation Offers Opportunities for International Research Collaboration

The Alexander von Humboldt Foundation of Bonn, Germany, provides highly qualified individuals of all nationalities the opportunity to conduct research in Germany. The Foundation's North American office in Washington, D.C., distributes information on collaborative research support programs to North American scholars.

Five different programs are available through the von Humboldt Foundation, each with its own distinct qualifications. The programs are: the Research Fellowship Program, the Humboldt Research Award, the Feodor Lynen Fellowship Program, the Max-Planck Award, and the Bundeskanzler Scholarship Program.

Qualified individuals are encouraged to apply for these programs. For more information about the Alexander von Humboldt Foundation and its programs, please contact Dr. Bernard Stein, Alexander von Humboldt Foundation, 1350 Connecticut Avenue, N.W., Suite 903, Washington, D.C. 20036; telephone 202-296-2990, fax 202-833-8514.

SECTION NEWS

Western Section

The Western Section of the ASPP is back in action after nearly decade of dormancy! Thanks to the initiative of a group of concerned ASPP members, including past president Russell Jones, president-elect Bob Buchanan, executive director Ken Beam, and board of trustees chair Larry Vanderhoef, the Western Section has been resurrected with the appointment of Sharman O'Neill, University of California at Davis, to the position of secretary-treasurer and the formation of an organizing committee to provide guidance to the Western Section concerning its role within the ASPP and its service to ASPP's members who reside in the western region of the United States.

The western region comprises approximately 1366 ASPP members, and as such, is a major constituency within the society. Because it has been inactive for so long, the Western Section has lacked full official representation within the society. The organizing committee met on July 21 at the University of California at Davis to discuss the revival of the Western Section of ASPP and to make plans for professional activities for the coming year. This report briefly summarizes the outcome of that meeting.

WS-ASPP '96 Meeting at The Presidio, San Francisco, California

The organizing committee recommended that a Western Section ASPP meeting be held in conjunction with that of the Bay Area Plant Biology Group (formerly called the Bay Area Plant Molecular Biology Group) in the

spring of 1996 at The Presidio in San Francisco, California. The Bay Area meeting is being organized by Wilhelm Grussem, University of California, Berkeley, and will be a two-day meeting. The high cost of travel and hotel accommodations arising from the large geographical distances of the western region will make it difficult for a Western Section meeting to compete with other meetings available to principal investigators, graduate students, and postdoctoral research associates. Therefore, the organizing committee was unanimous in its enthusiasm to target the large population base of plant biologists in the Bay Area who could easily travel in one day to such a meeting. If this first meeting is successful, we anticipate that future meetings would target other major regional centers in the west so if you cannot attend this first meeting, then there will be other opportunities in the future to attend another one in your area. ASPP headquarters will provide support for the WS-ASPP 1996 meeting, and travel awards will be available to those wishing to attend. Please stay posted for additional details of the spring 1996 meeting.

WS-ASPP General Election

The organizing committee also nominated a panel of Western Section members to run for general election to the Western Section executive committee by mail ballot later this year. All ASPP members who reside in the western region will receive a ballot and are strongly encouraged to vote for their future elected officials.

WS-ASPP on the Internet

A proposal to create a World Wide Web server and electronic newsletter

for the Western Section of the ASPP was enthusiastically endorsed by all present. On behalf of the WS-ASPP, Rolf Christoffersen (University of California, Santa Barbara), a member of the organizing committee, has set up a World Wide Web server to provide information to the ASPP membership about current activities of the Western Section and its members. The server will contain links to contact the WS-ASPP Executive Committee, information about future meetings of the Western Section, an e-mail and WWW home page directory of WS-ASPP members, job and graduate assistantship/fellowship position announcements, and other items of interest to plant biologists. The URL for this page is <http://lifesci.lscf.ucsb.edu/WSASPP/index.htm>. For more information about the WS-ASPP WWW Server, contact Rolf Christoffersen by e-mail at: christof@lifesci.lscf.ucsb.edu.

WS-ASPP Membership Drive

If you live in the western region and haven't joined the WS-ASPP, then please do so the next time you pay your national dues. The WS-ASPP needs everybody to join in to make this revival a successful endeavor! For information about membership, please contact Sharon Kelly at ASPP headquarters (e-mail skelly@aspp.org, telephone 301-251-0560, ext. 29). Not only do we need your membership, but we also need your ideas, suggestions, and energy. Please contact me to give your comments or to volunteer to become involved in this revitalization of the WS-ASPP.

Sharman D. O'Neill
University of California, Davis
Secretary-Treasurer, WS-ASPP
sdoneill@aspp.org



Public Affairs

DOE Energy Biosciences Receives Strong Support in Congress

Division Welcomes Grant Applications for FY 96

Both the U.S. House and the Senate approved spending \$30.2 million for research funded by the Department of Energy Division of Energy Biosciences in Fiscal Year 1996. This amount exceeds the President's request of \$29.5 million by 2 percent and the Fiscal Year 1995 appropriation of \$28.9 million by 4.5 percent.

The Senate Appropriations Committee legislative report noted with regard to the Division of Energy Biosciences program that "there exists a substantial need to discover and develop the appropriate technology to aid in environmental restoration initiatives. The Committee believes that more basic research must be conducted if the United States is to successfully surmount the numerous environmental cleanup and waste treatment challenges the Nation currently faces. The Committee notes the success the Division of Energy Biosciences has had in support of other energy-related fields, such as energy production, and is encouraged by

current research initiatives involving bioremediation. Accordingly, the committee has included the budget request for this program."

The House and Senate bills go to conference with the almost certain prospect that the conference report will recommend \$30.2 million for FY 96 for the Division of Energy Biosciences. There is still some question how the appropriations bills might be revised if the President vetoes them.

A number of ASPP members made timely contacts with their members of Congress in support of the Division of Energy Biosciences. This played a major role in reversing a proposed cut of more than \$3.2 million for Energy Biosciences in the FY 96 authorization that was approved earlier in the House Science Subcommittee on Energy and Environment. The reduced funds were subsequently restored to Energy Biosciences in action by the full Science Committee and more

funds were added. ASPP constituent contacts helped clear up a misunderstanding with regard to environmental research conducted by the Division of Energy Biosciences.

Despite the widely reported attempts by some in Congress to abolish the Department of Energy, the Division of Energy Biosciences is emerging from the appropriations process with increased funds to support vital basic energy research in FY 96. It is important that potential grantees are not misled by earlier published reports warning of the possible elimination of DOE. The Division of Energy Biosciences will be in a position to fund more new and continuing research in FY 96 as a result of this appropriations process. DOE will also be in existence next year and may well continue operations in following years, having survived recent calls for elimination.

NATIONAL E-MAIL NETWORK OF PUBLIC AFFAIRS CONTACTS FORMS CORE OF ASPP GRASS ROOTS EFFORTS

In response to requests from ASPP president Jim Siedow and committee on public affairs chair Ralph Quatrano, ASPP members in fifty states have volunteered to be contacts for their campuses on the ASPP public affairs contact network. These members are receiving alerts from ASPP on pending actions in Congress with updates on the issue and recommended courses of action. The campus contacts are subsequently notifying their colleagues on campus of the alert and urging them to send letters, make calls or, in some cases, schedule visits with their local Congressional offices.

The contact network takes advantage of some of the strengths in the ASPP membership for grass roots actions such as the existing capability of most ASPP members for speedy electronic communi-

cations on the Internet; the enhanced capability of e-mail to transfer messages to other recipients and to documents on word processing; the national scope of the membership with constituents of all Senators and many Congressmen; interest in developments affecting key grants programs and the need to support the programs; familiarity with other grantees who are in the same Congressional district and state.

The advantages of speed offered by the e-mail-based network were evidenced when ASPP contacted members of the network concerning a pending vote on the Farm Bill in the Senate Agriculture Committee in July. ASPP campus contacts were able to respond the same day of the alert and received favorable Committee consideration of some major por-

tions of their requests.

It is important to remember that there are winners and losers in virtually every vote taken in a legislature. Constituent contacts won't bring home a winner every time. However, the failure to act enhances the prospect of losing on an issue in nearly every instance. One of the easiest ways for a Congressional office to explain an unfavorable vote is to say it didn't know your concerns because it didn't hear from you.

The constituent actions of ASPP members have also demonstrated the organization of the ASPP grass roots effort to some key Congressional staff. Congressional staff regularly need to identify organized sources of support to help move

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legislation. Senate agriculture committee staff for both Democrats and Republicans have asked for ASPP to consider generating support on two subsequent issues as a result of receiving earlier grass roots contacts from ASPP members.

The contact network primarily supports plant science funding within USDA, NSF, and the DOE Division of Energy Biosciences. One example of the current efforts of the campus contacts relating to the National Research Initiative Competitive Grants Program (NRICGP) in the Fiscal Year 1996 spending bill illustrates their activities.

The NRICGP is a frequent target of some members of Congress looking for available funds for special research projects (sometimes referred to as "pork") in their home districts. As a result of a confusing series of events, many Congressional offices believe that the NRICGP did not receive any reduction in the House-passed bill. ASPP members have been explaining to Congressional offices that there is actually a reduction of nearly five percent for the NRICGP in the House-passed bill. Some staff close to the bill predict that the Senate may have less funds available for research than the House. This increases the need for key Senate offices to have a clear understanding of the House cuts in research and of the importance of NRICGP funding to their states.

The Senate Appropriations Subcommittee on Agriculture will take the first action on the House-passed bill. ASPP contact Dawn Luthe of Mississippi State University sent memos to her colleagues listing the amount of funds that Mississippi has received from the NRICGP and explaining the need to contact Sen. Thad Cochran (R-MS), chairman of the Senate Appropriations Subcommittee on Agriculture. Dr. Luthe also succeeded in conducting a meeting with Sen. Cochran's staff to explain the issue.

Another key member of the Appropriations Subcommittee on Agriculture is Sen. Mitch McConnell (R-KY). ASPP contact Joe Chappell of the University of Kentucky organized communications on campus to Sen. McConnell. Dr. Chappell, along with ASPP member colleagues George Wagner and Robert Houtz, also scheduled and conducted a meeting with Sen. McConnell's staff. McConnell's of-

fice expressed support for the competitive nature of the NRICGP and also discussed the Agricultural Competitiveness Initiative (ACI). (For more on the ACI, see story on page 9.)

In addition to these examples, many other members of the Appropriations Subcommittee on Agriculture, full Committee and full Senate, and several members of the House were contacted by ASPP members who are participating on the e-mail based contact network. The effort is particularly important in view of the sensitive and potentially dangerous nature of deliberations in Congress associated with federal budget balancing efforts.

Bernard Rubinstein of the University of Massachusetts and William Outlaw of Florida State University were among the earliest ASPP members to extend alerts to campus and regional colleagues. Lou Sherman of Purdue University, in addition to organizing alerts and meeting with his members of Congress and their staff, has also recently succeeded in getting a letter to the editor published in a local newspaper crediting two members of Congress from Indiana who played key roles in support of plant science research.

Congressional offices read the editorial pages in local newspapers and are delighted to see letters of support, especially in view of the frequently negative nature of news reporting. Public demonstrations of support such as this also enhance the continuing relationship between the constituent and member of Congress. One of the useful public affairs activities that is most neglected by many interest groups is the need to express appreciation to Congressional offices that offered assistance.

Jim Berry of the State University of New York at Buffalo as a different Congressman for his residence and campus and after sending letters, he is scheduling local meetings with both offices. There are more examples of important constituent contacts made by ASPP members than space limitations for this story would allow to report. Some representative examples will continue to be reported in future issues of the newsletter.

Constituent activities such as letters, calls, and visits to Congressional offices are a key foundation of public affairs efforts. Dr. Siedow and Dr. Quatrano expressed their appreciation to ASPP campus contacts for taking a lead in this effort.

Clutter, Cook, and Dilworth Discuss Research Support in the New Era of Budget Balancing

Mary Clutter, assistant director for the NSF Directorate for Biological Sciences, Jim Cook, chief scientist of the National Research Initiative Competitive Grants Program (NRICGP) and Greg Dilworth of the DOE Division of Energy Biosciences explained Fiscal Year 1996 budget implications for their programs at the ASPP annual meeting in Charlotte.

With Congress on a path to balance the budget in seven federally supported research programs are facing prospects ranging from small growth to small or large reductions to actual elimination.

Major programs supported by ASPP—USDA research, the National Science Foundation and DOE Division of Energy Biosciences—fit into the small cuts through small growth categories. The National Research Initiative Competitive Grants Program (NRICGP) comes out of the House down nearly five percent from Fiscal Year 1995 if you don't count the additional \$2.5 million freed up for NRICGP related to the United States-Israel Binational Agricultural Research and Development Program. (BARD is back in ARS for FY 96 in the House Bill.) If you count that \$2.5 million, funding for NRICGP is down slightly more than 2 percent from FY 95.

ARS research funding is down about one percent. NSF research appropriations are down about one percent. The DOE Division of Energy Biosciences is up 4.5 percent over FY 95—which is higher than the President's request. Of these programs, only DOE's spending bill has been approved by both the House and the Senate, with Senate action pending on the other programs. These programs fared better than many other research programs because of as the support of the majority in Congress for basic research and timely constituent support by ASPP members.

Dr. Clutter pointed out that there would be ample funds available for research even in this budget balancing environment if there was some change in priorities with relation to defense spending. Pending authorization legislation for the defense budget (S. 1026) provides \$7 billion more than the President's request. Congress might approve spending for a higher number of costly B-2 stealth bombers than the President requested.

NRICGP funds are the target of active campaigns by interest groups that want money redirected: to organic farmers, to on-farm research that helps only the small family farm, to special research (pork) projects at some universities that have close relations to members of Congress, to more economic and social work studies, and to a number of other areas. Dr. Cook explained some of the challenges facing the NRICGP in this budget.

Three categories within NRICGP: water quality, integrated pest management and pesticide impact assessment; lost funding in the House-passed FY 96 spending bill. These programs were also placed at risk by the USDA budget proposal to Congress to zero out funding for these three categories as specific line items and to fund them out of hoped-for exceptionally large increases in the remaining NRICGP categories. This would have given the NRICGP more desired flexibility in spending, but with the constricted budget, the very large requested increases for remaining categories did not occur. There was a small increase for plant systems in the House bill.

The House Appropriations Committee legislative report accompanying the FY 96 spending bill shows an increase for the NRICGP of more than \$3 million, but that does not take into account losses for water quality, pesticide impact assessment, and integrated pest management.

Despite the calls by several members of Congress to terminate DOE, Dilworth explained that the DOE Division of Energy Biosciences and most of the rest of DOE will be very much alive and doing business in FY 96. The increase for the DOE Division of Energy Biosciences was among the best that research programs received in this first year of the planned

seven-year journey to a balanced budget.

Drs. Dilworth, Cook and Clutter highly commended ASPP members involved in public affairs efforts to support research programs. Dr. Cook said no society does more to support the NRICGP than ASPP. Dr. Ralph Quatrano, chair of the ASPP Committee on Public Affairs, coordinated this program at the annual meeting.



Jim Cook (left), chief scientist of NRICGP, Mary Clutter, assistant director for NSF's Directorate for Biological Sciences, and Greg Dilworth (right), representative of DOE's Division of Energy Biosciences are shown with Ralph Quatrano, chair of ASPP's committee on public affairs, at the 1995 annual meeting.

New Competitive Research Program for USDA Proposed

The Agricultural Competitiveness Initiative (ACI), a legislative proposal, would authorize up to \$500 million a year for a new competitive grant program for research, extension and education.

Funding would be awarded competitively based on the relevance and quality of proposals. Scientists and researchers in colleges and universities, the state agriculture experiment stations, the cooperative extension service, the federal government, and the private sector would be eligible to compete for funding. A 50 percent match would be required for applied research that is commodity specific and not national in scope.

Federal funding for this initiative would come from the Commodity Credit Corporation with an offset from commodity programs. This would mark a departure from using the traditional source of *dis-*

cretionary funds for agricultural research in the federal budget. The staff draft of the legislation explains that the "ACI will bring a better balance to the total research and extension portfolio, addressing those areas in which current funding relative to user-driven national priorities is inadequate."

The ACI would be administered by USDA's Cooperative State Research, Education and Extension Service (CSREES) with funds awarded competitively based on relevance and quality of proposals. The National Research Initiative Competitive Grants Program is also administered within CSREES.

Recognition of the new trade environment was cited by supporters of the ACI. The Senate Agriculture Committee staff draft notes that, "The GATT and NAFTA call for U.S. agriculture to be more com-

petitive in the international marketplace. Intensifying demands on the U.S. agricultural system will dramatically increase the need for new knowledge and technology to allow the U.S. to sharpen its competitive edge in the world market and continue to produce and process nutritious, acceptable and safe products that meet environmental and consumer standards. The trend associated with GATT and NAFTA of continued reductions in federal commodity programs underlines the importance of sustaining the technological base for U.S. agriculture to adjust to a global free market economy."

Senator Richard Lugar (R-IN), chairman of the Senate Agriculture Committee, said he would like to offer the ACI as part of the Farm Bill when the committee considers commodities provisions. It is not

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known, but the first year proposed authorization may range from \$150 million to \$500 million in the proposal. The draft legislation for ACI resembles the proposal that earlier created the NRICGP. NRICGP staff would likely be asked to administer the ACI if the ACI was enacted.

Congressman Cal Dooley (D-CA) noted, "While our present policy focuses primarily on price supports, research can significantly increase crop yields as well as lower production costs, which is just as important to farm income as commodity prices."

ASPP has discussed the ACI proposal with staff of Senate and House agriculture committees, and USDA staff including Under Secretary for Research, Education and Economics Karl Stauber to learn some possible ramifications of the proposal. Stauber told ASPP that he thinks the Department will not formally support or oppose the ACI legislation. Stauber said risks of the proposal include possible subtraction from an existing source of federal agricultural research support if there is this new source of commodity funds for agricultural research through the ACI.

Stauber cautioned that commodity groups would want a greater say in how these funds are spent on ACI-supported research, and there may be a predominant emphasis on doing applied research. One commodity group had already cal-

culated its percentage share of lost commodity support to the ACI and told Stauber it wanted the same proportionate investment in research on its crops by the ACI. Some other USDA officials who are long-time supporters of competitive research, said the ACI could bring a much-needed infusion of funds for basic and applied agricultural research if properly implemented.

The majority staffs on the Senate and House Agriculture Committees said their members differ as to when they would like to see the ACI enacted. Senator Lugar is seeking enactment this year with the Farm Bill reauthorization. House Agriculture Committee Chair Pat Roberts (R-KS) does not want a multi-year research reauthorization enacted this year because he feels there are other sections of the Farm Bill which will require considerable deliberation. Roberts would like to have a short-term reauthorization of research in the Farm Bill this year and comprehensive review of research issues early next year for a multi-year reauthorization.

Although the controversy over using commodity funds for support of research and the differences of view as to when the ACI should be enacted may indicate that the proposal has some obstacles in the prospect for enactment, it is still believed that the ACI has a realistic chance for enactment this year.

Committee on Public Affairs Chair Ralph Quatrano said the ACI represents a tremendous opportunity for a potential new major source of support for needed plant science research, but may carry with it some risks to maintaining proper priorities for basic research. He said plant scientists need to be involved in supporting this new initiative for competitive agricultural research. This involvement will facilitate efforts to seek assurance of valid guidelines and priorities for administration of the program, Quatrano added.



Senate Agriculture Committee Chair Richard Lugar (R-IN) would like to spend an additional \$500 million a year on competitive agricultural research with the use of commodity support funds.

"Hot Papers" in *Plant Physiology* and THE PLANT CELL

The Scientist, an independent biweekly newspaper, occasionally features interviews with the authors of what the newspaper calls "hot papers," papers that have received an unusually high number of citations in the two years subsequent to their publication. Hot papers usually report what other practitioners of the particular branch of science in question consider to be breakthrough research. Both ASPP journals, *Plant Physiology* and THE PLANT CELL, have had hot papers singled out and honored in recent years. Two of the most recent were published in *Plant Physiology*.

The first paper, by Weeks et al. (Rapid Production of Multiple Independent Lines of Fertile Transgenic Wheat, 1993, 102:

1077-1084), described the transformation of wheat by a rapid, reliable method that uses no long-term tissue culture. This article was also featured on the cover of the journal and later on a *Plant Physiology* poster. The second paper identified by *The Scientist*, entitled Isolation and Initial Characterization of Arabidopsis Mutants That Are Deficient in Phytochrome A, was from the laboratory of Joanne Chory (Nagatani et al, 1993, 102: 269-277). These phyA mutants have allowed Chory's and others' research groups to determine the role of phytochrome A in plant development. For her work on phytochrome signal transduction, Joanne Chory was given ASPP's 1995 Charles Albert Shull Award (see page 16).

Last February, a hot paper from THE PLANT CELL was featured that also dealt with phytochrome, in this case, phyB and its role in the shade-avoidance reaction (Lopez-Juez et al., The Cucumber Long

Hypocotyl Mutant Lacks a Light-Stable PHYB-like Phytochrome, 1992, 4: 241-251).



Joanne Chory, Salk Institute of Biological Studies, La Jolla, California.

ASPP Education Forum

Edited by Robert Wise, Department of Biology, University of Wisconsin Oshkosh, Oshkosh, WI 54901, e-mail wise@vaxa.cis.uwosh.edu

Career Options Workshop Well Attended

With over 150 attendees, the career options workshop, which was organized by Dale Blevins, was one of the better attended events (next to the mixer) at the ASPP national meetings in Charlotte. Clearly, finding a job is a major concern of a significant number of our members.

The workshop consisted of a panel of ASPP members who have achieved professional success either in non-academic fields or at non-Ph.D.-granting universities and colleges. Each was invited to share with the audience personal perspectives on their chosen career path. The speakers were: Chris Brown, Dynamac Corp., Kennedy Space Center; William Carlson, Weyhauser Co.; Machi Dilworth, National Science Foundation; Carl Maxwell, DuPont Ag. Products; Dayle McDermitt, LI-COR Inc.; Laura Privalle, CIBA GEIGY Biotech. Res.; Magaly Rincon-Zachary, Midwestern State University; Susan Singer, Carleton College; and Nasser Yalpani, Pioneer Hi-Bred International. Following a brief statement by each panel member, the audience, composed mostly of graduate students and postdoctoral fellows, joined in the discussion.

Although no one in the audience was offered a permanent position as a direct consequence of the workshop, all in attendance agreed that it served a valuable function in raising awareness of the pressing needs of plant physiologists seeking a secure and enjoyable career path. Many of the same opinions and concerns that were raised at the career options workshop were also seen in a recent editorial by Don Doering (president, AquaPharm Technologies Corporation) in the August 18 issue of *Science*. Dr. Doering's editorial served to reinforce the notion that all career options should be viewed as equally

valid and vigorously pursued by scientists seeking to enter the job market. It was requested by participants that a similar workshop be held next year at the annual meetings in San Antonio, Texas.

Following the workshop, Michael Burnet (INRA, Versailles, France) met with interested students and postdocs for an informal discussion of the formation of a group within the ASPP to advance the needs of "students and those in danger of becoming a postdoc." For input or questions, Michael may be reached at <burnet@versailles.inra.fr>.

Education Grants Workshop Educates Educators

The education grants workshop (organized by Carl Pike) focused on National Science Foundation (NSF) grant programs of the Division of Undergraduate Education (DUE). The principal presenter was ASPP member Bill Cohen of the University of Kentucky, who has served as a visiting scientist with DUE. Bill thus provided the perspective of both a faculty member and an NSF officer.

DUE presently has five major programs. The goal of all reflects DUE's mission, "All students achieve excellence." Funding for DUE seems to be reasonably stable and secure for fiscal year 1996.

Course and Curriculum Development (CCD) grants are directed primarily to improvements in introductory courses. Multidisciplinary and interdisciplinary activities are encouraged as well as the recruiting and training of students for K-12 teachers. Projects are expected to have national impact and to yield products such as books, computer software, and teaching materials.

Instrumentation and Laboratory Improvement (ILI) grants support improvements in laboratory and field courses by providing matching funds for acquisition of equipment. Successful proposals provide innovative models of excellence for using new equipment and other materials. The Leadership in

Laboratory Development component of ILI provides funds for the intellectual effort and planning needed to develop national models for undergraduate laboratory instruction.

Workshops and short courses are a major activity funded by Undergraduate Faculty Enhancement (UFE) grants. These programs, which should include follow-up activities, help faculty keep abreast of new techniques and developments. Training in innovative teaching methods can also be an important component. Grants are made to professional societies as well as colleges and universities.

Projects in teacher preparation are supported by the Collaboratives for Excellence in Teacher Preparation (CETP). CETP grants are usually for large-scale projects for comprehensive changes that will increase the quantity and quality of teachers well-prepared to teach science.

Advanced Technology Education (ATE) grants support efforts to improve the training of technicians for business and industry, including, of course, the biotechnology industry. The projects are usually collaborations of 2-year institutions (the key component) with universities, schools, business, etc.

Two ASPP members who have received grants from DUE, William Adams (and colleagues, University of Colorado) and John Markwell (University of Nebraska), described their proposals and projects. Both commented that reviewers looked favorably on the use of the equipment in several courses and student independent research as well as a strong institutional commitment. NSF will not fund replacement or basic (pH meters, balances, etc.) equipment unless a particularly convincing case can be made for the items as part of the overall curriculum. The proposal should provide enough equipment for the expected enrollment; if too little equipment is requested, then the impact on the students will be minimal.

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John Markwell's request included very specific plans for dissemination, such as publishing articles in "Journal of Chemical Education". John has also received an LLD grant in which university and high school faculty have developed labs on plant pigments for both K-12 and undergraduate use resulting in the publication of a laboratory manual. Several of the labs have also been distributed on the Internet.

The last part of the workshop involved the evaluation of a sample proposal by attendees. Bill Cohen explained the main criteria used by reviewers: the intrinsic merit of the ideas, the capability of the people and the institution, the utility of the project to the proposing community, and the impact on the national infrastructure of science. He mentioned that panelists are not all plant biologists, so authors need to talk more broadly about the biology.

Anyone intending to apply for DUE programs should obtain a copy of the "Program Announcement and Guidelines" (94-160). Use NSF's electronic publication dissemination system, STIS. To the address <stisserv@nsf.gov> send the following text message: get index. You will receive a list of all the documents on STIS and instructions for retrieving them. Bill emphasized that it is always valuable to discuss a proposal informally with NSF staff in the early stages of preparation.

Workshop for HS Science Teachers Provides for Exchange of Resources and Ideas

Fourteen Charlotte and Mecklenberg County high school teachers attended the Plant Science High School Teachers Workshop, titled "From Soup to Nuts with Plants: New, Do-able Ideas for High School Curricula." The teachers were presented with four poster talks that showcased simple, inexpensive approaches to teaching principles in plant physiology. The talks were: Demonstrating Basic Genetic Principles with Plants (Rich Jorgensen, UC Davis), Fruit Development and Anatomy (Jim Giovannoni, Texas A&M), The Uses and Functions of Plant Roots (Hector

Flores, Pennsylvania State University), and The Sensory Plant (Liz Van Volkneburgh, University of Washington and Bob Wise, UW Oshkosh).

Following the poster talks and lunch, a two hour brainstorming session was held to allow for the exchange of ideas among all of the participants regarding what sorts of materials are most needed by high school science teachers. Many very good ideas were given to the meeting organizers, thus providing the Education Committee with much to do for the following year. Suggestions on what resources the ASPP can provide, what sorts of exercises are the most useful, and how best to reach high school teachers were among the most stimulating. A similar workshop that will expand on these themes is on the agenda for the 1996 meetings in San Antonio.

The workshop was organized by Dina Mandoli with help from Maxine Highsmith (Shaw University, Raleigh, NC) and Doug Luster (USDA/ARS, Fort Detrick, MD).

Uncle ASPP Needs You

Why do leaves turn color in the fall? Why doesn't grass die when mowed, or why doesn't it grow well under a tree? Why do plants need water to live? Why does too much water suffocate them?

These are basic questions about the plants in the world around us to which plant physiologists have pretty good answers. These are also the sorts of questions that K-12 teachers are often asked by their students.

Wouldn't it be great if ASPP members could share their knowledge with students and teachers in their local school system? Yes... yes, it would.

Towards that end, this year's ASPP membership renewal form will contain a check box to indicate if members are willing to act as local contact persons for basic questions pertaining to plants and plant physiology. The advantage of using the membership renewal form to recruit for this service is that no one is committed for more than a year. If for whatever reason, it doesn't work out, the member simply does not volunteer again for the next year and his/her name is removed from the directory.

At this early stage, the list of volun-

teers will be maintained at ASPP Headquarters. This list would be made available to the members of the National Association of Biology Teachers. Classroom instructors needing information would contact headquarters and be given the name of a local ASPP member who can work with them and answer their questions.

Eventually, the volunteer list will be placed on the ASPP home page on the World Wide Web (currently under development—more on this in the near future). K-12 teachers with questions relating to plants would access the home page and be given the name(s) of the ASPP members nearest their school who are willing to serve as resource contact persons. (Note: Currently only about a quarter of U.S. school systems have Internet access, so not all teachers will be able immediately to take advantage of this service. However, more systems are linking up each day, and it is felt that enough are currently logged on to signal that now is the time to act). The ASPP Web site will also have a section full of answers to the most frequently asked questions.

An on-going and long-term goal of the ASPP Education Committee is to provide resources to our members to allow them to take their knowledge of plants to the local community. This means the development of creative and fun teaching materials for the lecture hall and laboratory as well as linking members "in the field" to the educational resources available to the Society as a whole.

Over fifty ASPP members responded to the education survey last year (see Education Forum, Nov/Dec 1994). It is anticipated that those people would form the core of this outreach effort, although with over 4000 ASPP members on the roster, the possibility for expansion would seem obvious.

Please watch for this new service on the 1996 renewal form and consider lending a hand.

Wound-Healing, Poster Videos, and Job Brochure For Sale

The videos entitled "How to Make a Great Poster" and "Wound Healing in Acetabularia" (both by Dina Mandoli, University of Washington) which were initially shown at the 1994 meetings

were made available for sale at the 1995 meetings. Several extra copies are on hand and more can be generated if market forces demand it. Order your own personal copy of either video by sending \$10 per video and \$3 for shipping and handling to Sharon Kelly at ASPP, 15501 Monona Drive, Rockville, MD, 20855-2768.

A brochure by the American Society of Cell Biology entitled "How to Get a Job in the 90's" was also offered at the annual meetings in Charlotte. Although focused primarily on the needs of women job seekers, it contains a wealth of useful information for anyone looking for a job in today's market. Copies of this useful pamphlet are still available and may be obtained from headquarters. Send \$1 per copy to Sharon Kelly (address above).

"Black Box" Exercises Teach Scientific Method

It is not uncommon for students to ask the question, "How do we know that XYZ (atoms, hormones, proteins, etc.) exist if we can't see them?" This issue was recently discussed on the Plant Ed Newsgroup and the following laboratory using the powers of indirect observation was recommended.

Called the "Black Box Exercise," the concept has been around for decades. Many variations exist and more are produced with every iteration. Walter Sundberg (Southern Illinois University) noted that each instructor, because of his/her background and general creative nature, will be able to come up with a wealth of interesting and effective variations.

In short, students are given opaque, sealable containers containing objects such as a paper clip, short glass rod, M&M candy (sounds like metal but melts in hot water), metal washer, hexagonal nut, coins, glass marble, metal ball bearing, plastic coverslip, paper match, rubber band, needles of different lengths, or glass beads of different sizes. According to Steve Wolf (CSU, Stanislaus), black plastic film canisters are ideal because they are waterproof in case you want to warm them in a water bath, of uniform shape, and nearly identical in weight. Since they are also round they are useful for determining the shape of

what's inside. They also provide for very distinctive sounds among the various contents. Students may or may not be given a list of possible contents. The class is then divided up into groups of two or three and challenged to identify the contents of several of the sealed containers. Although students work in groups they soon discover that it helps to communicate with others working on similar problems, just like real scientists. For example, not all will think of using a magnet but once one does, the rest will follow.

In the room, but kept out of sight, are balances, magnets, water baths, thermometers, and any other piece of scientific equipment that the students might think of to use in determining the canister's contents. Invariably someone will ask for an x-ray machine. This is a good opportunity to point out that science is often limited by budgetary constraints and that your "grant" for an x-ray machine was turned down. You can also turn this around and ask if an x-ray machine would be 100% accurate given the items you have selected.

By never divulging the contents of each canister, the experiment is very real in that scientists do not have a hidden "answer key" to validate their observations. The important lesson here—especially if neither the teacher nor the students ever really know what is in each canister—is that indirect powers of observation can be used to learn a great deal about what cannot be directly seen, felt, or touched. And, since there is no "list of contents" where one can check his/her observations, the whole exercise is very real—one never "knows for sure." The "truth" one arrives at results from the techniques used and those that are available. As in real life, new techniques may yield new and/ alternative answers to the questions of "What's in the box?"

This exercise can also be used to demonstrate how to write a scientific paper. The students make observations, construct a hypothesis, and then test it. They can even work in a little statistics and sampling methods. For example, if the weight of an empty canister is a data point to be used in identifying contents, do all the empty canisters

weigh the same? How many should be weighed to find the mean, what is the range of variation in their weights?

Although no one had a readily available published source for this exercise, Walt Sundberg has included it as "the mystery box" in a workbook that he had prepared locally entitled "Using Fungi as a Tool For Teaching Biological Principles In the High School Biology Laboratory" (Walter J. Sundberg, 1985, 1987, 1989. Kinko's Professor Publishing, Carbondale, IL).

Thanks go to Katie Clark (Purdue University), Guy Farish (Adams State College), Jon Monroe (James Madison University), Walter Sundberg (Southern Illinois University), Steven J. Wolf (CSU-Stanislaus), and Cris Woolston (University of Hull, UK) for their contributions of ideas and discussion on this topic.

ASPP Members Asked To Attend NRC Regional Education Symposia

The ASPP is looking for members who live in or near Boston, Ann Arbor, Houston, and Pomona to serve as our representatives to National Research Council one-day meetings on undergraduate education. Please contact Carl Pike if you would be willing to participate in the symposia. ASPP has been invited to send a representative to each of four one-day National Research Council (NRC) regional symposia on undergraduate education issues. To maximize discourse, most of the time at each symposium will be devoted to input from participants, thus providing a unique opportunity for ASPP to help shape national educational policy.

The NRC regional symposia will explore issues in undergraduate education that are common to the science, mathematics, engineering, and technology (SME&T) communities. The goal is to expand discussion that began at a national convocation, "From Analysis to Action: Undergraduate Education in Science, Mathematics, Engineering, and Technology Education" that was sponsored by the NRC and the National Science Foundation (NSF) in April 1995.

These regional symposia will help the NRC undergraduate education

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committee as they prepare reports and recommendations on the status and improvement of undergraduate SME&T education. The symposia will also provide valuable input to a new NSF study that will produce a set of recommendations for improving undergraduate education called "Review of Undergraduate Education" (see following article). Federal spending on undergraduate education is likely to be very strongly influenced by the final NSF report; therefore, the NRC and NSF are working closely together on these national projects.

The four one-day symposia are scheduled for the following locations and dates:

- Monday, October 16, 1995 University of Michigan, Ann Arbor
- Friday, November 10, 1995 GTE Laboratories Conference Center, Boston, Massachusetts
- Friday, January 19, 1996 Johnson Space Center, Houston, Texas
- Thursday, February 1, 1996 Pomona College, Claremont, California

Following the regional symposia, the NRC (with funding from the E on Education Foundation) will then sponsor up to fifteen additional forums that will focus on more specific topics related to undergraduate SME&T education. The NRC has asked ASPP and other national organizations to serve as a host for one of the topic forums at our national meetings. We are in communication with the NRC regarding the role that ASPP members and the ASPP Education Committee can play in organizing one of the topic forums.

There is no fee but advanced registration (of about one month) is required. Participants must provide their own transportation, lodging, and meals. To receive additional information on the symposia and obtain registration materials, please call (202-334-1462), e-mail (regsymp@nas.edu), or fax (202-334-3159). Further information may also be obtained from ASPP education committee members Carl Pike (c_pike@acad.fandm.edu) or Bob Wise (wise@vasa.cis.uwosh.edu).

NSF Review to Explore How Current Innovations Can Reinforce Undergraduate Science Education

The National Science Foundation (NSF) has begun a year-long review of undergraduate science, mathematics, engineering and technology (SME&T) education in the United States. According to Dr. Luther S. Williams, NSF's assistant director for Education and Human Resources, the review is expected to provide guidance as to how large-scale changes in undergraduate education could be designed to improve quality and how NSF can most effectively capitalize on recent investments made in undergraduate science education. "NSF undergraduate programs have supported innovative projects to improve instruction at many two-year and four-year colleges and universities. We hope to find out how the results of these and of similar projects funded by others can be used as the basis for larger-scale systemic change," Williams said. The review, to be carried out by the Advisory Committee of NSF's Directorate for Education and Human Resources, will consult widely with educators, students, and employers to provide analysis on the condition and support of undergraduate faculty, curriculum, and capabilities for teaching and scholarship in undergraduate institutions. It will be headed by Dr. Melvin D. George, vice president of institutional relations at the University of Minnesota. The review will consist of three phases.

First, there will be direct contact with individuals and organizations who are the "customers" of the varied programs and institutions that deliver undergraduate education plus intensive study of existing reports and data. Second, preliminary findings from the first phase will be presented for comment to individuals and organizations experienced in undergraduate SME&T education and the employment of its graduates. Regional hearings will be held, and there will be discussions with faculty, administrators, and employers attending key professional society meetings.

Third, NSF will seek to publicize and encourage implementation of those practices that will achieve improved science and technology literacy, a technically more capable workforce,

better prepared teachers and scientists and engineers, and broader participation in SME&T careers. According to Robert Watson, director of NSF's Division of Undergraduate Education, projects supported by the NSF may focus on a single discipline, engineering or chemistry, for example; reach across disciplines, joining physics and biology for example; or be targeted on a special group of students, such as future elementary and secondary school teachers. "The ultimate goals of improved undergraduate SME&T education include citizens who are empowered to be full participants in a scientific and technological society, and a technically well-prepared workforce that can both participate and lead in a high performance workplace employing advanced technologies," said Watson.

Note: The preceding article is from a press release received directly from the NSF. Press releases and other information are now available electronically on NSFnews, a free service available via the Internet. To subscribe to NSFnews send an e-mail message to listmanager@nsf.gov. In the body of the message (not the subject line) type the words <subscribe nsfnews> and then type your name (not an e-mail address). For example: <subscribe nsfnews James Smith>. The system will reply with a confirmation via e-mail. For additional information about NSFnews send another e-mail message to listmanager@nsf.gov and in the body of the message type the word <help>.

ASPP Goes Hollywood (Sort of!)

ASPP was recently approached by the producers of the PBS show "The Magic School Bus" to review a program on plants for the "Science Bible". The Magic School bus is a very popular children's show. The episode in question focuses on plants and the role of photosynthesis in primary production. Water and mineral movement through the whole plant are also featured. Dina Mandoli (an avid fan of children's PBS shows) volunteered to provide an expert's opinion of the program for which she and the ASPP will receive a credit line. Dina is now rumored to be in line to co-star with Tom Cruise in an epic, feature-length film about the lives of the great botanists.

Article Available on Flower Genetics

Fred Lehle (Lehle Seeds, Round Rock, Texas) pointed out to the Plant Ed newsgroup the recent publication of an article entitled "A Garden of Mutants" by Carol Fletcher in the August issue of Discover magazine (p. 48-53). Dr. Lehle notes that there has been a great deal of progress in the last few years in flower genetics and this article provides a concise and easily understandable, non-technical overview.

Erratum

Part Two, Step 5 from Mark Shotwell's UV light lab that appeared in the July/August issue of the Education Forum was inadvertently omitted. It should read:

"5. Place three 100-white pots and three 100-gold pots in the UV crosslinker. Turn off the room lights and turn on the yellow light. Expose the plants to 100 J/m² of ultraviolet light. (Note: J/m² = x100uJ/cm², the units on the

crosslinker). Then place the pots under the white lights or in the gold-light chamber as appropriate. IMPORTANT: Remember which pots have white labels and which have yellow labels, since in the dim yellow light they will all look yellow. VERY IMPORTANT: Protect the 100-gold pots from white light as much as possible so that photoreactivation cannot occur."

Plant Physiology Editorial Board Changes

At its annual meeting in Charlotte, North Carolina, the editorial board of *Plant Physiology* welcomed 14 new editors. The normal term for associate editors and monitoring editors on the board is three years, renewable only once. Turnover ensures that the board is refreshed with new expertise to keep pace with changes in plant biology research. Turnover also ensures that the important service that editors contribute to our professional community does not become overly burdensome to their own research and scholarly activities. For this very reason a number of excellent editors retired after their first three year period.

June Nasrallah (Cornell University), who was a monitoring editor for three years, has taken over as associate editor for plant development and growth regulation.

Among monitoring editors, **Kent Bradford** (UC Davis) replaces Derek Bewley in the area of seed physiology, and **Vicki Chandler** (U. of Oregon) will handle submissions dealing with genetics and molecular biology.

The biochemistry of metabolites involved in plant-pathogen and plant-insect

interaction was ably handled by Charlie West for the past three years, and now **Joe Chappell** (U. of Kentucky) will take over his duties. **Ken Cline** (U. of Florida) will be the resident chloroplast cell/molecular biologist, while **Mark Estelle** (U. of Indiana), known for his work on auxin-resistant mutants of *Arabidopsis*, will monitor submissions in the fields of auxins, *Arabidopsis* mutants, and plant growth. Also in the area of hormones and plant growth, **David Ho** (Washington University) has expertise in the hormonal regulation of gene expression both at the cellular level and the gene level.

Steven Huber (USDA-ARS, Raleigh, North Carolina) is an enzymologist who is particularly interested in the regulation of enzyme activity by phosphorylation and cytosolic carbohydrate metabolism. **Steve Kay** (U. of Virginia) will help fill the void in photobiology left by the departure of Joanne Chory, and in addition he brings an exciting new dimension: biological timing. **Harry Klee** (U. of Florida), who recently moved from Monsanto, will handle papers in biotechnology, cell and tissue culture, and ethylene physiology.

Leon Kochian (Cornell University) adds needed strength in one of *Plant Physiology's* traditional fields: mineral nutrition. This field has seen tremendous growth with development of patch clamping techniques and the cloning of ion channels and transporters (our other expert in this area is Sally Assmann).

Anthony Moore (University of Sussex) replaces the irreplaceable Jim Siedow in the field of mitochondrial biochemistry (we will continue to send Jim a large number of papers for ad hoc review so he may not notice the difference). **Thomas Okita** (Washington State U.) and **Michael Salvucci** (USDA-ARS Phoenix, Arizona) are enzymologists/biochemists interested in the regulation of metabolism. Together they follow the carbon flow from carbon dioxide to starch. **Karl Oparka** (Scottish Crop Research Institute, Invergowrie) replaces Bob Turgeon as the resident expert in long distance transport through the phloem and partitioning of photosynthate.

Maarten Chrispeels
Editor, *Plant Physiology*
University of California, San Diego

Coming Soon

1996 MEMBERSHIP AND SUBSCRIPTION RENEWAL FORMS

Renew early to guarantee your listing in the membership directory and to avoid any interruption in your journal subscriptions.

ASPP AWARDS

Following are excerpts of the citations that were read at the awards ceremony at the 1995 ASPP annual meeting. In addition to these awards, a special service award was made to Dr. Robert Rabson to recognize his efforts on behalf of plant science while he headed the DOE Division of Energy Biosciences and throughout his career.

Charles Albert Shull Award: Joanne Chory

The Charles Albert Shull Award was initiated in 1971 by the Society to honor Dr. Charles A. Shull, who was largely responsible for the founding and early growth of the Society. The award is made biennially by the Society for outstanding investigations in the field of plant physiology by a scientist who resides in North America, and who is less than 40 years old or within 10 years of having earned the doctoral degree.

Joanne Chory is awarded the 1995 Charles Albert Shull Award of the American Society of Plant Physiologists for her highly original and innovative research that has started to reveal the molecular architecture of the signal pathways between light perception and downstream photomorphogenic responses such as gene activation, leaf development, and growth control.

In her early work, Chory isolated and characterized novel mutations that remarkably show key aspects of the light grown, de-etiolated phenotype in the dark. These studies have had a major impact on the whole field and led to the isolation of new classes of nuclear regulatory genes, counterparts of which are now being found in animals. Chory subsequently pioneered the use of promoter-selectable marker gene fusions to generate transgenic plants as targets for mutagenesis, thereby identifying novel genetic loci that regulate downstream components in photomorphogenic signal pathways and also clearly demonstrating a signal pathway from the chloroplast to the nucleus. In addition, Chory has characterized the contribution of individual phytochrome genes to specific aspects of



Left to right: Charles Arntzen, speaker at awards ceremony; Eli Romanoff, Gude Award; James Siedow, ASPP president; Jan Graebe, corresponding member; Elliot Meyerowitz, Martin Gibbs Medal; Robert Rabson, special service award; Joanne Chory, Shull Award; Carl Pike, Teaching Award. Not pictured: Roland Douce, Corresponding Member.

the syndrome of plant responses to changes in the light environment.

Individually, each of these studies is a major contribution to our field. Collectively they represent a tour-de-force that is changing how scientists think about and study physiological signaling in plants. Joanne Chory is a worthy recipient of the 1995 Charles Albert Shull Award.

Martin Gibbs Medal: Elliot Meyerowitz

This award, initiated in 1993, honors Martin Gibbs for his outstanding service to the Society as editor-in-chief of *Plant Physiology* from 1963 to 1993. This award is to be given biennially to an individual who has pioneered advances that have served to establish new directions of investigation in the plant sciences.

The Martin Gibbs Medal is awarded to Professor Elliot Meyerowitz, who has made several original contributions that have established new directions of investigation in the plant sciences. In particular, he has championed the use of *Arabidopsis thaliana* as a model system for molecular genetic research, and he has used *Arabidopsis* to reveal many important aspects of floral morphogenesis. He

is an expert researcher and an outstanding spokesman for the plant sciences. He well deserves the Martin Gibbs Medal.

Charles Reid Barnes Life Membership Award: Jack Dainty

The Barnes award is the oldest ASPP award. It was established in 1925 in honor of Dr. Charles Reid Barnes, the first professor of plant physiology at the University of Chicago. It is an annual award of life membership in the Society given to recognize the awardee for meritorious work in plant physiology.

Dr. Jack Dainty, plant biophysicist, physics and mathematics to plant physiology. With his first Ph.D student, Enid MacRobbie, he showed the importance of electrical potentials for ion transport in plant cells. This led to collaborative studies with A. B. Hope on water permeability and ion exchange properties of plant cells and to investigations of fixed charges on cell walls. He introduced to plant physiologists the importance of unstirred layers of potentially rate-limiting barriers in transport processes.

Dainty served as associate editor for the journal *Plant Physiology* from 1977 to 1980 and again from 1983 to 1987. He is a Fellow of the Royal Society of Edinburgh

and the Royal Society of Canada and has received the Gold Medal of the Canadian Society of Plant Physiologists.

For his meritorious work in plant enlightened by his work, we select Jack Dainty as the recipient of the 1995 Charles Reid Barnes Life Membership Award. biophysics, for his dedication to the idea that plant physics and plant physiology go together, for those physicists that he encouraged to explore plant physiology, and for the many plant physiologists who have been

Excellence in Teaching Award: Carl Pike

This award was initiated in 1988 to recognize outstanding teaching in plant biology. It is an award to be made not more than triennially in recognition of excellence in teaching, leadership in curricular development, or authorship of effective teaching materials in the science of plant biology.

Carl S. Pike is an all-around teacher, researcher, and citizen. Dedicated first to his undergraduate students, he has served as inspirer, mentor, and friend to many undergraduates who have passed for over 25 years through his classes at Franklin & Marshall College in Lancaster, Pennsylvania. His style encouraged his students to experience the excitement in plant biology. "His clarity, knowledge, and enthusiasm for the field and for teaching served to foster a deeper appreciation for science and how it was done." Carl's contributions to teaching excellence extend beyond the ivory tower and into the trenches of our elementary and secondary schools where he in learning about science which set many of them on a career in science. He has supervised the research of more than 45 undergraduates, many of whom have gone on to professional and graduate training, several has brought hands-on science education to a corps of young citizens. Carl is a highly valued exemplar for us all.

Adolph E. Gude, Jr. Award: Eli Romanoff

This award honors the Gude family, who made possible the establishment of the Gude Plant Science Center. The award, established by the Society and first given in 1983, is to be made triennially to a scientist or lay person residing in North America in recognition

of outstanding service to the science of plant physiology

The triennial Adolph E. Gude award for outstanding service to the science of plant physiology is given to Dr. Eli Romanoff. Dr. Romanoff served as Director of the Metabolic Biology program at the National Science Foundation from the mid 1960s to the mid 1980s. He championed funding for plant science beginning at a time when only very few in the granting agencies were sympathetic towards funding for the plant sciences. It was Dr. Romanoff's major achievement that plants were given a fair shake in the Metabolic Biology program. Dr. Romanoff was also instrumental in ensuring that younger plant physiologists were given a fair chance to launch their scientific careers, and he therefore made as conscientious an effort to fund excellent proposals from young scientists as those from well-established scientists. Although he had a Ph.D. in mammalian physiology and no experience in plant physiology prior to coming to NSF, Dr. Romanoff alerted NSF administrators to the value of plant physiology, and in turn, plant physiology and the American Society of Plant Physiologists flourished.

The American Society of Plant Physiologists is proud to present the Gude Award to Dr. Eli Romanoff.

Corresponding Membership:

This honor, initially given in 1932, provides life membership and a Society publication to distinguished plant physiologists from outside the United States. The honor is conferred by election on the annual ballot.

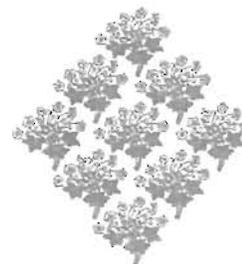
Roland Douce

Roland Douce (Centre d'Etudes Nucléaires, Grenoble, France) is one of the preeminent plant biochemists in Europe. His exacting methods in research have been applied to the study of plant organelles and suborganellar fractions. In his work on chloroplast envelope biochemistry and mitochondrial metabolism, Dr. Douce has pioneered and developed novel purification procedures for these subcellular membrane and organellar fractions that have become the standard protocols for isolation of contamination-free fractions. He has contributed to the understanding of plastids through his

characterization of the lipid and protein components of the chloroplast envelopes and transport processes across them. He has also studied the soluble enzymes within non-photosynthetic plastids. Dr. Douce and his coworkers have made a number of significant contributions to the understanding of plant mitochondrial metabolism, including work on the transport of coenzymes into plant mitochondria and work on mitochondrial enzymes involved in the conversion of glycine to serine during photorespiration in leaves. Recent work on plastid enzymes by Dr. Douce and his coworkers has led to the sequencing and characterization of a cDNA encoding the acetohydroxy acid isomeroreductase from Arabidopsis.

Jan E. Graebe

Jan Graebe (Institute of Plant Physiology, University of Göttingen, Germany) is a world leader in the field of gibberellin biosynthesis. He was the first researcher to exploit cell free systems to study gibberellin biosynthesis in higher plants. His careful and detailed work led to the now generally accepted scheme of the three-stage biosynthesis of gibberellins. Additionally, his technique of using high specific activity ¹⁴C-mevalonic acid to obtain high specific activity of the gibberellin intermediates became a standard among gibberellin researchers. Once Prof. Graebe elucidated the biosynthetic pathways for GA synthesis, his continuing work led to the understanding of many of the mechanistic aspects of gibberellin synthesis, such as the involvement of dioxygenases and their co-substrates that catalyze the hydroxylations of stage III pathways. Recently, he and his coworkers reported the cloning and expression of the gene for the gibberellin-20 oxidase from Arabidopsis.



PEOPLE

• **Steven P. Briggs**, ASPP member and a co-editor of *THE PLANT CELL*, was promoted in the spring to research fellow and coordinator, disease resistance, at Pioneer Hi-Bred International, Inc. Research fellows spend a substantial amount of time on novel research approaches that would enhance the capabilities of research and product development at Pioneer. They also act as management consultants and as mentors for other scientists. Briggs is internationally recognized for isolating and characterizing the first plant disease resistance gene, *Hm1*, and for establishing the mechanism of resistance to the fungal pathogen *Helminthosporium carbonum*. He also is recognized for his work in cloning and characterizing the *anther ear 1* gene, the first maize gene for the biosynthesis of the growth hormone gibberellin.

• **Peter M. Gresshoff**, Racheff Chair of Plant Molecular Genetics at the University of Tennessee, Knoxville, was elected as a foreign member of the Russian Academy of Agricultural Sciences at the national meeting of the Academy in February of this year. He traveled to Moscow in early June to deliver the inaugural lecture on "Legume Genome and Nodulation Gene Analysis." Gresshoff is known for his work on supernodulation and non-nodulation mutants of soybean, the first discovery of a molecular marker linked to the supernodulation and nitrate tolerance gene *nts*, and recently for the first construction of yeast artificial chromosomes and physical mapping of soybean.

• **Winslow Briggs** was selected for the 1995 Agricultural Research Service Sterling B. Hendricks Memorial Lectureship. The lecture took place at the American Chemical Society fall meeting in Chicago on Wednesday, August 23, 1995. The lectureship was established in 1981 by ARS to honor the memory of Sterling B. Hendricks and to recognize scientists who have made outstanding contributions to the chemical science of agriculture. Dr. Briggs is currently director emeritus of the Carnegie Institution of Washington, Department of Plant Biology and Professor, Department of Biological Sciences, Stanford University. Dr. Briggs was an associate editor of *Annual Review of Plant Physiology* from 1960 to 1972 and its editor from 1972 to 1993. He also was

president of ASPP in 1975-1976 and of the American Institute of Biological Sciences in 1981. In 1994, Dr. Briggs won ASPP's Stephen Hale Prize.

• **Xing-Wang Deng**, associate professor in the Department of Biology, Yale University, was named by President Clinton to receive a Presidential Faculty Fellow Award. Only 30 scientists and engineers nationwide were so honored, and Dr. Deng is the only plant scientist in the group. The Presidential Faculty Fellow awards recognize young faculty members who demonstrate excellence and promise both in scientific or engineering research and in teaching. The award carries a grant from the National Science Foundation of \$100,00 per year for up to five years. Dr. Deng received his Ph.D. in 1989 from the University of California at Berkeley, after having received his bachelor's and master's degrees from Beijing University in Beijing, People's Republic of China. His research is directed to understanding how plants modulate their growth pattern in response to light environments and optimize their efficiency in harvesting the available light energy. He teaches at both the undergraduate and graduate levels and is actively involved in reforming the undergraduate biology curriculum at Yale to integrate the plant sciences into all core biology courses.

• The Rheinischen Friedrich-Wilhelms-Universität Bonn (Germany) on February 1, 1995, conferred an honorary degree, Dr. agr. h. c. (doctor of agricultural sciences), on **Martin J. Bukovac**, University Distinguished Professor at Michigan State University. Dr. Bukovac was the 1988 winner of ASPP's Dennis Robert Hoagland Award, given triennially for outstanding plant physiological investigations in support of agriculture.

• **Eugene L. Vigil**, who will become chair of ASPP's Minority Affairs Committee on October 1, is leaving his position as plant physiologist with the Climate Stress Laboratory of USDA/ARS in Beltsville, Maryland, to take a position as Health Scientist Administrator with the Minority Opportunities for Research (MOR) Division in the National Institutes of General Medical Sciences. In this new position at the National Institutes of Health, Gene will have responsibilities in the Minority Biological Research Support and Minority

Access to Research Careers programs of MOR. He will also be involved in fellowship programs and new initiatives supporting minorities in biomedical science.

DEADLINES FOR NSF GRANT PROPOSALS

Listed below are deadlines for NSF grant proposals in areas likely to be of interest to ASPP members. The number in parentheses following the name of a program is the number of the appropriate NSF publication that describes the program and the application process in detail. A complete listing of all deadlines is available on the World Wide Web at <http://x.nsf.gov:80/bio/biodead.htm>

October 27, 1995

- Preproposals: BIO Research Training Groups (NSF 95-114)
December 15, 1995
- Faculty Early Career Development Program (NSF 95-118)
January 10, 1996 and July 10, 1996
- Cell Biology (NSF 95-39)
- Biochemistry and Molecular Structure and Function (NSF 95-39)
- Genetics and Nucleic Acids (NSF 95-39)
- Developmental Mechanisms (NSF 95-39)
- Physiology and Behavior (NSF 95-39)
March 1, 1996
- Formal Proposals: BIO Research Training Groups (NSF 95-114)
May 1, 1996
- Multi-user Biological Equipment and Instrumentation Resources (NSF 95-37)



Gatherings

All announcements are subject to editing. Wherever possible, submit announcements via e-mail to jcarlson@aspp.org. Alternatively, mail submissions to Jody Carlson, *ASPP Newsletter*, 15501 Monona Drive, Rockville, MD 20855-2768 USA. Because announcements are scanned into the computer, **faxed transmissions will not be accepted.**

FUTURE ASPP ANNUAL MEETING SITES

1996: San Antonio, Texas
Saturday, July 27, through
Wednesday, July 31

1997: Vancouver, British Columbia, Canada
Saturday, August 2, through
Wednesday, August 6

OCTOBER

October 25-29
11th Annual Meeting
American Society for Gravitational and Space Biology
Crystal City, Virginia
For further information contact: Donald R. Beem, American Institute for Biological Sciences, Special Science Programs, 730 11th Street NW, Washington, DC 20001; telephone 202-628-1500. See July/August 1995 ASPP Newsletter for details.

October 25-November 1
Short Course: Optical Microscopy and Imaging in the Biomedical Sciences
Marine Biological Laboratory
Woods Hole, Massachusetts
For forms and information contact: Admissions Coordinator, Marine Biological Laboratory, Woods Hole, MA 02543; telephone 508-289-7401; e-mail admissions@mbi.edu. See July/August 1995 ASPP Newsletter for details.

NOVEMBER

November 2-5, 1995
International Symposium on Photoinhibition Photoprotection and Crop Productivity in Guangzhou
The People's Republic of China
Full information and application forms

available by contacting: Secretariat: Zhi-Fang Lin, South China Institute of Botany, Academia Sinica, Guangzhou 510650, China; fax 86 20-7701031; or Clanton Black, Biochemistry and Molecular Biology, University of Georgia, Athens, GA 30602 USA, fax 706-542-1738, e-mail black@phoenix.cs.uga.edu.

November 5-9
First Joint USA-México Symposium
Agrobiology, Molecular Physiology, and Biotechnology of Crops Important to Mexican Agriculture
Cocoyoc, Mexico
For more information and registration packets (hotel reservation forms, abstract forms, etc.) send your complete mailing address to Maarten Chrispeels (mchrispeels@ucsd.edu) or Alejandra Covarrubias (crobles@pbr322.ceingebi.unam.mx). See March/April 1995 ASPP Newsletter for details.

November 26-December 1
Sustainable Agriculture for the Tropics: The Role of Biological Nitrogen Fixation
Angro dos Reis, Brazil
Information and registration forms can be obtained from Dr. Avilio A. Franco, EMBRAPACNPAB, Km 47, Estrada Antiga Rio San Paulo, Seropedica, Itaguai, 23851-970, Rio de Janeiro, Brazil. See July/August 1995 ASPP Newsletter for details.

1996

JANUARY

January 18-20, 1996
18th Annual Symposium in Plant Physiology
How Plants Use the Light Environment to Regulate Growth and Development
University of California, Riverside
Organized by Winslow Briggs, Carnegie Institution of Washington; Elaine Tobin, University of California, Los Angeles; and Robert L. Heath, University of California, Riverside. Sessions include properties of the developmentally important photoreceptors (W. Briggs, P-S. Song, A. Cashmore, P. Quail); light regulation of gene expression (E. Tobin, E. Schaefer, R. Last, W. Thompson); signal transduction (G. Neuhaus, R. Crain, A. Batschauer, W. Boss); use of mutants to understand light-regulated growth and development (R. Hangarter, X. W. Deng, J. Chory, E. Liscum, III); and whole plant responses to the light environment (A. Teramura, G. Whitelam, S. Kay). The symposium is limited to 175 persons. A poster session will be held on Thursday evening, January 18. A registration fee of \$65 (non-students) and \$25 (students) will cover registration and a luncheon on Saturday, January 20. For further information and an application form, contact: Cindi McKernan, Department of Botany and Plant Sciences-072, University of California, Riverside, CA 92521-0124, telephone 909-787-3423, fax 909-787-4437.

January 25-27, 1996
Third DBMS Workshop
Plant Cell Metabolism and Its Regulation
Villard de Lans, France
For information, contact: Dr. Jacques Joyard, DBMS/PCV, Grenoble, France, telephone 33-76-88-41-84, fax 33-76-88-50-91. See July/August 1995 ASPP Newsletter for details.

MARCH

March 10-16, 1996

Seventh International Symposium on Flower Bulbs

Herzliya, Israel

Convener of the meeting is A. H. Halevy. For more information, contact Ortra Ltd., P.O.B. 50432, Tel Aviv, 61500, Israel; fax 972-3-5174433. See January/February 1995 ASPP Newsletter for details.

March 10-16, 1996

Third International Workshop on Basic and Applied Research in Plasmodesmal Biology

Zichron Yakov, Israel

For further information contact one of the following: Bernard Epel, Division of Plant Biology MRC7, The Scripps Research Institute, 10666 North Torrey Pines, La Jolla, Ca 92037; fax 619-554-6330; e-mail bepel@scripps.edu; Shmulik Wolf, Department of Vegetable Crops, The Faculty of Agriculture, Hebrew University, Rehovot, Israel 76100; fax 972-8-468-265, e-mail swolf@agri.huji.ac.il; William Lucas, Section of Plant Biology, University of California, Davis, California 95616; fax 916-752-5410, e-mail wjlucas@ucdavis.edu. See March/April 1995 ASPP Newsletter for details.

March 15-21, 1996

**Keystone Symposium
The Extracellular Matrix of Plants:
Molecular, Cellular and
Developmental Biology**
Tamarron, Colorado

Organizers: Andrew Staehelin, Michael Hahn, Norman Lewis, Andrew Mort, Keith Roberts. Keynote address: Structure and Function of Glycosyltransferases, J. Lowe; Banquet address: Cell Wall Research—Past and Future, P. Albersheim. Topics/speakers: Structure and biochemistry of cell wall polysaccharides and glycoproteins/ A. Darvill, A. Mort, M. Kieliszewski, TBA; Biochemistry, molecular biology and biosynthesis of lignin/N. Lewis, J. Dean, A. Boudet; Biosynthesis I: Secretory pathway and synthesis of glycoproteins/A. Staehelin, S. Waffenschmidt, TBA; Biosynthesis II: Matrix polysaccharides, callose, and cellulose/N. Carpita, B. Wasserman, D. Delmer; Role of the extracellular matrix in plant growth development (I and II)/K. Roberts, A. Clarke, R. Quatrano, D. Cosgrove, C. Brownlee, TBA; Role of cell walls in symbiosis and pathogenesis (I, II, and III)/M. Hahn, H. Spaink, N. Shibuya, G. DeLorenzo, C. Lamb, B. Fritig, two TBA; Cell walls in food, feed and industry (I and II)/J. Reid, A. Voragen, D. Della Penna, A. Bennett, TBA. Attendance limited to 300. Application and abstract deadline is October 18, 1995. Anyone who has ever applied to a

Keystone Symposia conference will automatically be sent application information. Otherwise, contact Keystone Symposia, Drawer 1630, Silverthorne, CO 80498; telephone 303-262-1230, fax 303-262-1525.

APRIL

April 11-13, 1996

New Biological Approaches to Understand and Improve Winter Survival of Plants
Århus, Denmark

Contact: Bjarni L. Gudleifsson, RALA Modruvellir, 601 Akureyri, Iceland; telephone: + 354-6-24477, fax + 354-6-27144. See January/February 1995 ASPP Newsletter for details.

April 12-19, 1996

9th International Congress on Soilless Culture

St. Helier, Jersey, Channel Islands

Write to Secretariat of ISOSC, P.O. Box 52, 6700 AB Wageningen, The Netherlands. See January/February 1995 ASPP Newsletter for details.

April 15-17, 1996

Starch: Structure and Function
Cambridge, UK

Contact: Mrs. M. A. Staff, Cavendish Laboratory, Madingley Road, Cambridge, CB3 0HE, United Kingdom; telephone 44-1223-3370007, fax 44-1223-337000. See March/April 1995 ASPP Newsletter for details.

April 17-20, 1996

**15th Annual Missouri Symposium
Protein Phosphorylation in Plants**
Columbia, Missouri

Submit abstracts or write for registration material to Missouri Symposium, 117 Schweitzer Hall, University of Missouri, Columbia, MO 65211; fax 314-882-5635. See July/August 1995 ASPP Newsletter for details.

MAY

May 5-10, 1996

Model Program in Environmental and Agricultural Ethics
Michigan State University, East Lansing
Iowa State University Life Sciences Bioethics Institute teaches basic methods and principles in ethics to life science faculty members, focusing on those who deal with the environment, food, nutrition, animals, and agriculture. The institute equips faculty to introduce discussions of ethical issues into existing science courses. Three philosophers, Professors Fred Gifford and Tom Tomlinson (Michigan State) and Gary

Comstock (Iowa State), will be joined by internationally recognized experts in ethics to lecture on moral theory and to lead discussion sessions of pedagogy. The institute provides case studies, classroom exercises, bibliographies, and other practical strategies used successfully by life scientists to introduce ethics into their classes. Possible issues to be covered: intellectual property rights; honesty and integrity in scientific research; environmental ethics and intrinsic value of ecosystems; labeling of genetically engineered foods; animal welfare and rights; justice between developed and developing economies risk assessment and the politics of uncertainty; feminist moral theory; the place of human beings in nature. Stipend: All participants will receive \$250. Requirements: Applicants must be tenured or tenure-track life science faculty members. The institutions of out-of-town applicants must commit funds to cover applicant's travel, lodging, and meals. Applicants promise to introduce the equivalent of at least one hour-long discussion of ethics into each semester-length class they teach. The deadline for applications is March 1, 1996. Contact: Professor Fred Gifford, Philosophy Department, 503 S. Kedzie Hall, Michigan State University, East Lansing, MI 48824; telephone 517-355-4490, e-mail gifford@pilot.msu.edu.

May 9-19, 1996

**Eighth NATO Advanced Study Institute
Course: Signals and
Pathways in Plants**
Maratea, Italy,

Pending NATO approval. Organizers: Natasha Raikhel, Michigan State University, East Lansing, Michigan, USA; Rob Last Boyce, Thompson, Ithaca, New York, USA; Fiorella Lo Schiavo, University of Padova, Padova, Italy; and Giorgio Morelli, National Institute of Nutrition, Rome, Italy. More information available at a later date.

May 12-17, 1996

**VIII Congress
International Society of Citriculture**
Sun City Resort, South Africa

For information, contact: Congress Secretariat, Institute for Tropical and Subtropical Crops, Private Bag X 11208, Nelspruit 1200, South Africa; telephone 27-1311-52071, fax 27-1311-23854, e-mail supervisor@itsg.arc.agric.za. See May/June 1995 ASPP Newsletter for details.

May 27-June 1, 1996

Seventh International Conference on the Cell and Molecular Biology of Chlamydomonas
Regensburg, Germany

This conference is being organized by Drs. Rüdiger Schmitt and Peter Hegemann,

Universität Regensburg, and Elizabeth Harris, Duke University, and is sponsored by the Deutsche Forschungsgemeinschaft, Bavarian State Government, and Genetics Society of America. Platform sessions will include cell cycle and differentiation; flagella: biogenesis, assembly, and function; photosynthesis; vision and chemical senses; innovations in genetic and molecular biology; organelles (genetics, organization and function); cell wall and membrane; mating, evolution, and taxonomy; algae and lower eukaryotes for the study of new phenomena; and molecular toolkit (workshop). Investigators interested in participating are invited to submit abstracts by January 31, 1996. Send request for registration and abstract materials to Dr. Rüdiger Schmitt, Institut für Biochemie, Genetik und Mikrobiologie, 93040 Regensburg, Germany; telephone 00 49 943-941-3162, fax 00 49 943-941-3163; or send e-mail to chlamy@acpub.duke.edu.

May 28-June 1, 1996

**Arc et Senans Plant Workshop: Roots
Arc et Senans, France**

This is the first in a new series of workshops sponsored by Zeneca Plant Science and Rhone Poulenc and organized in collaboration with *The Plant Journal*. The workshop will provide a new interdisciplinary forum to explore the subject of "Roots" from the perspective of different disciplines. Recent advances will be reviewed, the present status of research addressed and future opportunities defined. A main feature of the workshop will be the opportunity for young researchers and established leaders in the field of study to meet together to discuss their interests. There will be sessions on: origin, growth and development of the primary root; cell division and root growth; lateral roots and root architecture; root physiology and function; roots and other organisms; roots and agriculture. Opportunities for poster presentations, short talks, and round table discussions are scheduled. For further information, contact: Dr. Louise Dewhurst, IFAB Communications, Department of Biology, University of York, PO Box 373, York YO1 5YW, United Kingdom; fax 44 1904 433029, e-mail biocomms@york.ac.uk.

JUNE

June 2-5, 1996

**The Monroe Wall Symposium on
Natural Products:
Harnessing Biodiversity for Therapeutic
Drugs and Foods
New Brunswick, New Jersey**

Organizers: Rutgers University and Xechem, Inc., New Brunswick, NJ 08901 USA. For

further information, contact: Keith Wilson, Office of Continuing Professional Education, Rutgers University, Cook College, P.O. Box 231, New Brunswick, NJ 08903-0231; telephone 908-932-9271, fax 908-932-1187.

June 9-13, 1996

**NATO Advanced Research Workshop
Biology and Biotechnology of the Plant
Hormone Ethylene
Chania, Crete, Greece**

Co-sponsored by the European Union TMR-Euconference and COST-915 programmes. Objectives: Ethylene is a major plant hormone that plays a key role in many developmental processes including ripening and senescence. The detrimental effects of endogenously produced ethylene on the acceleration of fruit ripening and senescence causes great losses in commercial horticulture. In the last decade, the key biochemical steps involved in ethylene biosynthesis have been elucidated. Recently much progress has been made towards understanding the ethylene perception and signal transduction pathway. Topics: Biochemical and molecular mechanisms of ethylene synthesis, stress ethylene: biochemical and molecular approaches; biotechnological control of ethylene synthesis, perception and signal transduction pathways, ethylene involvement in pathogenesis and disease resistance; ethylene action control; ethylene and senescence of plant organs; growth-development, applied aspects. Organizer: Dr. Angelos K. Kanellis. To be added to the symposium mailing list, send your name and address to: Dr. Angelos K. Kanellis, National Agricultural Research Foundation, Institute of Viticulture and Vegetable Crops, PO Box 1841, 711 10 Heraklion, Crete, Greece; telephone 30 81 245851 or 245873, fax 30 81 245873 or 245858, e-mail kanellis@nefeli.imbb.forth.gr.

June 16-21, 1996

**Third International Symposium on in Vitro
Culture and Horticultural Breeding
Jerusalem, Israel**

For more information, or to receive a call for papers, contact Third International Symposium on in Vitro Culture and Horticultural Breeding, P.O. Box 50006, Tel-Aviv 6500, Israel. See May/June 1995 ASPP Newsletter for details.

June 22-26, 1996

**1996 World Congress on In Vitro Biology
Biotechnology: From Fundamental
Concepts to Reality
San Francisco, California**

Contact: Tiffany McMillan, telephone 410-992-0946, fax 410-992-0949. See July/August 1995 ASPP Newsletter for details.

June 23-26, 1996

**Second International Symposium on the
Biology of Root Formation and
Development
Jerusalem, Israel**

For more information, or to receive a call for papers, contact Second International Symposium of the Biology of Root Formation and Development, P.O. Box 50006, Tel-Aviv 61500, Israel. See May/June 1995 ASPP Newsletter for details.

June 23-28, 1996

**Seventh International Conference on
Arabidopsis Research
University of East Anglia, Norwich, United
Kingdom**

Registration details will be posted to the international and United Kingdom Arabidopsis bulletin boards by September when finalized. The opening lecture is to be given by Jonathan Hodgkin of the MRC, Cambridge, United Kingdom. The seven lecture sessions will cover the following topics: floral development, vegetative development, floral transition and embryogenesis, plant pathogen interactions, hormones, metabolism, photoperception. There will also be workshops and a permanent poster display area during the week. 1996 Meeting Organizing Committee members are: Mike Bevan, George Coupland, Caroline Dean, Dick Flavell, Nick Harberd, Mary Rayward-Smith. Queries may be addressed to: arabidopsis@bbsrc.ac.uk.

JULY

July 7-12 1996

**12th International Symposium on
Plant Lipids
Toronto, Canada**

Contact John P. Williams, Department of Botany, University of Toronto, 25 Willcocks St., Toronto, Ontario, Canada M5S 3B2; telephone 416-978-3540, fax 416-978-5878, e-mail lipids96@botany.utoronto.ca. See July/August 1995 ASPP Newsletter for details.

July 14-17, 1996

**4th IUBMB Conference
The Life and Death of the Cell
Edinburgh, Scotland**

Contact: The Meetings Office, The Biochemical Society, 59 Portland Place, London W1N 3AJ, United Kingdom; telephone 44-171-580-5530, fax 44-171-637-7626, e-mail meetings@biochemsoc.org.uk. See July/August 1995 ASPP Newsletter for details.

July 14-18, 1996

5th Symposium of the International Society of Root Research:

Root Demographics and Their Efficiencies in Sustainable Agriculture, Grasslands, and Forestry
Clemson, South Carolina

For additional information please contact Dr. James E. Box, Jr., USDA-ARS, P.O. Box 555, Watkinsville, GA 30677, U.S.A., or by e-mail rootconf@uga.cc.uga.edu, fax 706-769-8962, telephone 706-769-5631. Please supply your name, complete address, and, if available, your e-mail, fax, and telephone numbers. See July/August 1995 ASPP Newsletter for details.

July 14-19, 1996

8th International Symposium on Molecular Plant-Microbe Interactions and
7th Annual Gatlinburg Symposium
University of Tennessee, Knoxville

For more information, contact: Dr. Gary Stacey, Director, Center for Legume Research M409 Walters Life Science Bldg. The University of Tennessee Knoxville, TN 37996-0845 USA; fax 615-974-4007; e-mail: gstacey@utk.vx.utk.edu. See July/August 1995 ASPP Newsletter for details.

July 21-24, 1996

Third International Fructan Symposium
Logan, Utah

Contact: N. Jerry Chatterton, USDA/ARS, Forage and Range Research, Utah State University, Logan, Utah 84322-6300, USA; telephone 801-797-2249, fax 801-797-3075, e-mail njchatt@cc.usu.edu.

AUGUST

August 4-9 1996

Postharvest 96:

Fourth Yearly International Conference on Postharvest Science
Taupo, New Zealand

For more information and registration materials contact: Dr. Ian Ferguson, HortResearch, Private Bag 92 169, Auckland, NZ; telephone 00 64 9 849 3660, fax 00 64 9 815 4202, e-mail iferguson@hort.cri.nz. See July/August 1995 ASPP Newsletter for details.

August 5-8, 1996

5th International Plant Cold Hardiness Seminar

Oregon State University, Corvallis

Contact: Tony Chen, Department of Horticulture, Oregon State University, Corvallis, Oregon 97331; telephone 503-737-5444, fax 503-737-3479, e-mail chent@bcc.orst.edu; or contact Paul I. Department of Horticultural Science, University of Minnesota, St. Paul, MN 55108; telephone 612-624-1757, fax 612-624-4941, e-mail lixxx008@maroon.tc.umn.edu.

Institute of Environmental Health Sciences, recommends that infants in the affected areas be given bottled water, rather than tap water, during the growing season, when most of the herbicides are applied. In recognition of the problem, the Dupont Company, manufacturer of cyanazine, plans to phase out production of that herbicide within the next several years. In the meantime, the U. S. House of Representatives has voted to eliminate all money that goes to monitor drinking water, including a \$1 billion loan program to help towns purify water contaminated with herbicides.

It seems to me that ASPP, as a scientific society closely connected with the discovery and application of herbicides, has a responsibility for looking into this situation. If the facts in this report are true, then we should immediately recommend altered schedules of herbicide use, together with an accelerated search for safer, more rapidly biodegradable herbicides. And if dangerous levels of herbicides are indeed contaminating the drinking water supplies of so many Americans, we should urge that Congress restore, and in fact increase the money used to monitor and remove these substances. Sincerely,

Arthur W. Galston
Eaton Professor, Emeritus
Yale University
Former President (1962-1963), ASPP

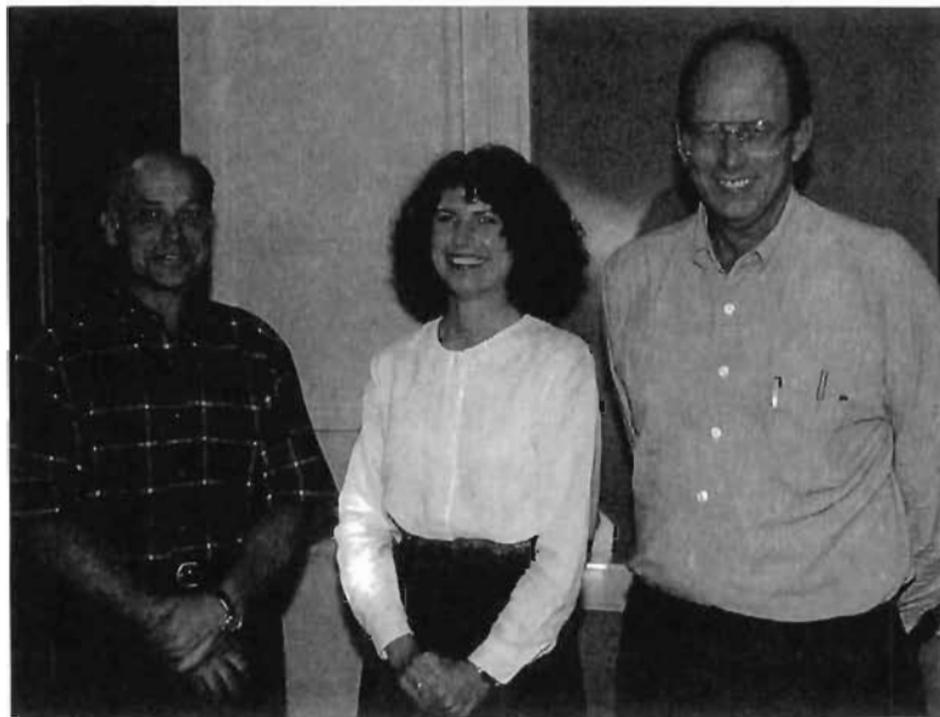
LETTER TO THE EDITOR

The *New York Times* of August 18, 1995, carries, on page A10, a news report that ought to be of concern to officers and members of ASPP, especially those interested in the public affairs aspects of our science. Under the headline "Weed Killers in Tap Water in Corn Belt: Study Sees Danger to Young Children," the *Times* reports that a study by the Environmental Working Group, a private environmental research and advocacy organization headquartered in Washington, D.C., finds that tap water in the Corn Belt is dangerously contaminated with herbicides. Samples were collected every three days from faucets in kitchens, bathrooms, and offices, the first time that such an extensive study has been conducted throughout the

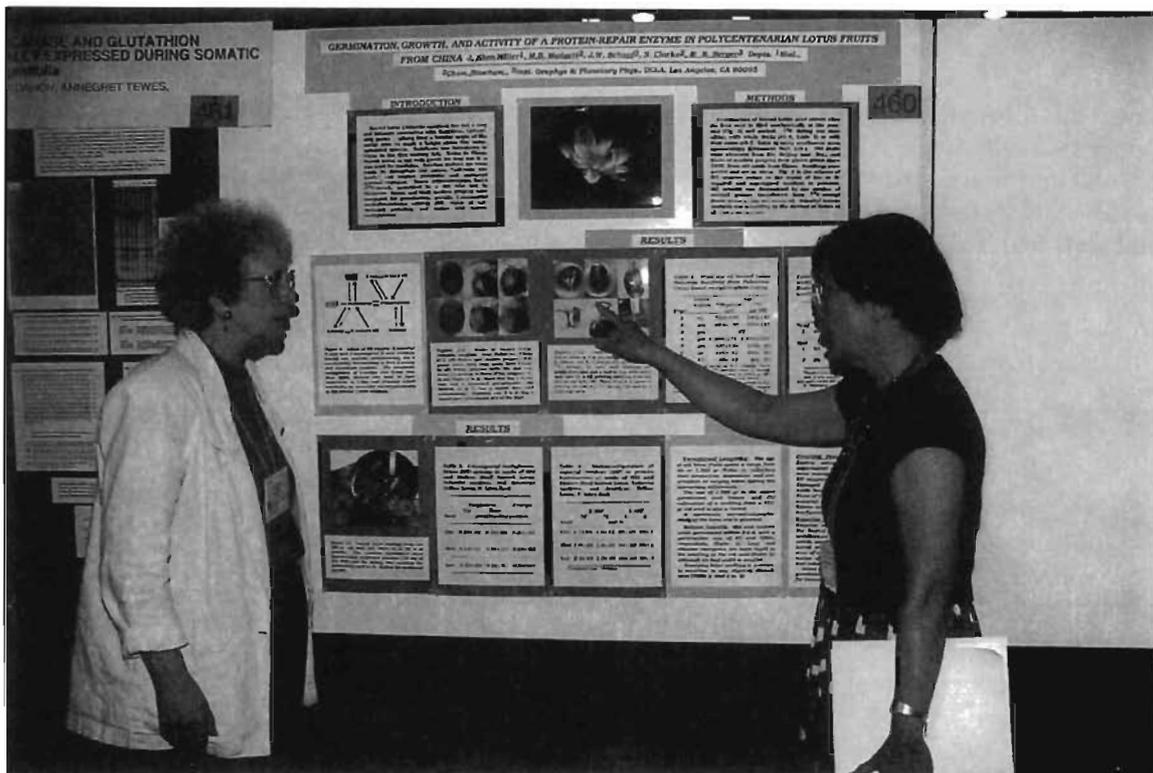
Corn Belt. The drinking water of all 29 cities and towns tested contained appreciable herbicides, and in 18 the levels exceeded federal safety standards. The worst violations were found in Danville, Illinois, where the level of cyanazine was 34 times the federal standard, and in Fort Wayne, Indiana, where a typical glass of drinking water contained nine kinds of herbicides. In all, it is estimated that 20-25 million Americans ingest herbicides with their drinking water, the greatest exposures being found in New Orleans, where Mississippi River Water is used. By contrast, cities such as Chicago, Cleveland, and Milwaukee, which draw their water from the Great Lakes, are not affected.

The situation in the affected areas is sufficiently serious that Dr. David Rall, formerly director of the National

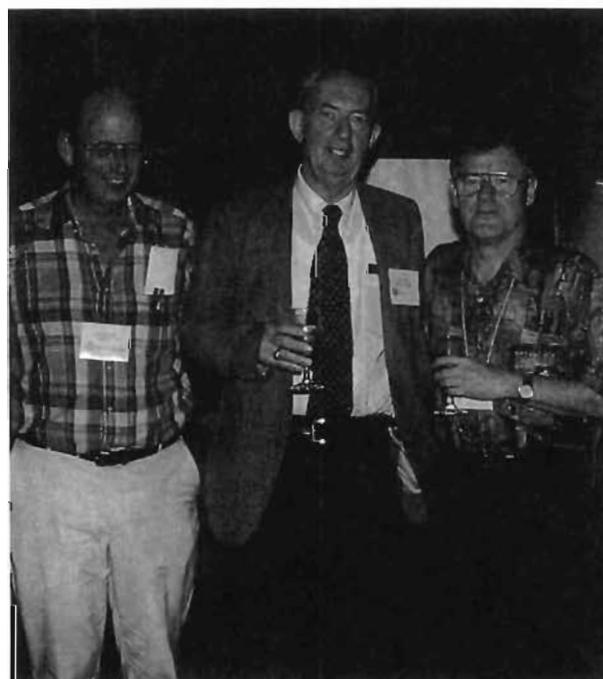
Deadline
for the
November/December
1995 issue
of the
ASPP Newsletter
is November 1, 1995.



Officers of ASPP who will assume their positions on October 1, 1995: (l-r) Don Ort (USDA/ARS, University of Illinois), president-elect; Mary Jo Vesper (Dayton University), secretary; Bob Buchanan (University of California, Berkeley), president.



At the 1995 ASPP annual meeting, Jane Shen-Miller (right) describes to Anne Datko her finding that a 1288-year-old *Lotus* seed was still viable because of a highly stable pollen protein repair enzyme.



Enjoying a moment at the annual meeting are (l-r) Bob Buchanan, Dick Laster (chair of the ASPP Education Foundation), and Russell Jones.