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NEWSLETTER

American Society of Plant Physiologists

Inside This Issue. . .

Deadline for the January/February 1995 issue of the *ASPP Newsletter* is December 20, 1994.

SIEDOW: "ASPP HAS COME FAR; EDUCATION IS OUR CHALLENGE"

New President Follows Lead of Predecessor Emphasizing Need To Improve Plant Science Education

As I start my term as president of our society and reflect on the changes that have occurred in the twenty plus years that I have belonged to ASPP and the ten or so years that I have been involved with its governance, it strikes me as nothing short of remarkable how far we have come.

ASPP has moved from publishing strictly *Plant Physiology* to also publishing THE PLANT CELL and two or three books each year. The Society may be the world's single most influential journal publisher on the broad topic of basic plant science, a fact which is also underscored by the enhanced international distribution of the membership of the Society over this same time span. Our efforts in the publishing arena are even expanding into textbook publishing as a result of the decision of the executive committee to proceed with the long overdue publication of a successor to the venerable text *Plant Biochemistry*. Joe Varner and Himadri Pakrasi will be the editors.

Both journals continue to prosper. Brian Larkins is proceeding with a special issue of THE PLANT CELL scheduled for publication in July 1995 that will also focus on the general topic of plant biochemistry. The executive committee has approved a proposal by Maarten Chrispeels for electronic submission and publication of *Plant Physiology*'s plant gene register articles—the Society's initial foray into the world of electronic publishing (see page 5). There is no question about the position of our publications as the jewels in the ASPP crown and with all that is presently taking place with them, I have no doubt that their future remains bright.

In his last letter to you, my predecessor, Russell Jones, noted a number of issues outside of publications that are currently the focus of Society attention. Russell and I realized two years ago that the Society needed to identify additional sources of revenues if it was to be in a position to participate in areas such as

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This Issue Includes the Call for Abstracts for the 1995 Annual Meeting

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education and public affairs in any major way. We are all aware that our libraries are strapped for funds these days, and we could not in good conscience expect the libraries to support these other endeavors even if their funds were unlimited. With that in mind, Russell and I agreed that Hans Kende's vision of an ASPP foundation was clearly on target. However, we also recognized that developing this foundation would not be an overnight thing, and it would take the concerted efforts of several consecutive ASPP presidents to see the project from its inception to the point that it would become a self-sustaining entity.

Under Russell's presidency, the Society took the initial steps to make this vision a reality with the approval by the executive committee this past summer to proceed with the development of the ASPP Education Foundation (ASPPEF). As spelled out by Russell in the last newsletter, the broad goal of the ASPPEF will be to raise monies from a variety of sources to support ASPP projects in education that will encompass all educational levels and society at large. You, the membership, will ultimately need to formally grant your approval for the ASPPEF in this spring's election. I will be spending considerable space in future columns providing more details of the goals of the proposed ASPPEF and its importance to the future of the Society. Specifics of the structure of the ASPPEF appear on page 35 of this newsletter. I would also encourage anyone who has questions and/or comments regarding this very important initiative to feel free to contact me directly. I am a particular fan of electronic mail and can be reached at <jsiedow@acpub.duke.edu>. Particularly important is the need to identify both the individual who will serve as the chair of the board of the ASPPEF and people who can serve effectively on that board. We are presently looking at potential candidates for the position of chair, but I would welcome your suggestions of any individuals who might be appropriate to serve in either capacity.

While the ASPPEF will be looking to raise money from corporate and other institutional sources, it will also be relying on the contributions of private individuals including you, the membership of the ASPP. When you receive your renewal notice this year, you will find a category for giving to the ASPPEF. I am joining with Russell Jones in contributing to the Foundation the honorarium that goes with my position as president of the Society. I strongly encourage each of you to be as generous as you can in making a donation to help get this infant endeavor off to a solid start.

In his address to the Society at the annual meeting, as well as in several articles in the newsletter over the past year, Russell stressed the need for the Society to greatly extend its efforts at all levels in the broad area of education. I agree with those sentiments entirely and much of the impetus for setting up the ASPPEF derived from this recognition, coupled with the fact that engaging in new good works usually costs money. However, in the near-term there are things that we can do that are not especially expensive, and it is worth my updating you on the Society's ongoing efforts in the area of education.

Susan Singer has generously agreed to remain an additional year as chair of the education committee to lead the recently expanded committee through the coming year, and it has hit the ground running. If the volume of e-mail correspondence that I have been copied on from committee members is any indication, we can look forward to some really good things coming out of the committee this year. Articles in the Education Forum section of this newsletter (see pages 14-16) will keep you apprised of what the education committee is doing. Every member who has any role in education should consider reading the Education Forum *de rigueur*. Further, the Teaching Booth at next year's annual meeting in Charlotte, North Carolina, will include materials of significant interest to graduate students, postdocs, and teachers alike.

It is a real joy to see what can be accomplished by a limited number of the Society's members when they display the kind of commitment that the members of our education committee are presently showing. However, as the committee continues to develop projects, they will of necessity need to involve others (see page 16). This works like a kind of human chain letter, so I strongly encourage any of you who are approached by the education committee to get involved in the many projects it is currently initiating. The dividends that will ultimately be paid to both the ASPP and society as a whole will be well worth the time invested in such efforts.

Education is the key and the ASPP can ill afford to let the presentation of plant sciences in the basic biology curriculum at both the K-12 and secondary levels drop below its current minimal status. The same could be said about the public's awareness of all things plant. Educating the public, other educators and, most importantly, ourselves represents an important component of a challenging process, but it is a process that we must participate in if the plant sciences are to take their rightful place among the other biological sciences in the eyes of the public at large and within the classroom. The education committee can serve as a catalyst for this effort, but in the final analysis, it will take the input of a large number of the Society's members if our efforts are to truly make a difference.

With the initiation of the ASPPEF and the recent activities of the education committee, we have begun to move in the right direction. It will be my goal as president of your society to ensure that we remain on track and moving forward. In that regard, I look forward to the coming year and working with and for each of you in this vitally important endeavor.

James N. Siedow
ASPP President, 1994-95
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Mail your membership and journal subscription renewals in before the end of 1994 to assure your listing in the 1995 Membership Directory and to receive *Plant Physiology* and THE PLANT CELL without interruption.

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Changes in Job Postings Take Effect with Next Issue of Newsletter

POSTDOCTORAL, GRADUATE ASSISTANTSHIP, AND TECHNICIAN POSITIONS

(academic and government installations)

- Limited to 100 words.
- Ads run two times: the first time entire; the second time, only location, contact name and address, and reference to original posting.

TENURE-TRACK POSITIONS

(academic and government installations)

- Limited to 200 words.
- $150 to run one time, $250 to run two times.

ALL PRIVATE COMPANY POSITIONS

- Limited to 200 word.s
- $150 to run one time; $250 to run two times.

GRADUATE FELLOWSHIP ANNOUNCEMENTS

- Announcements of programs and fellowships or traineeships for students seeking advanced degrees will be grouped at the end of the job placement section at nc charge. They will run one time full length with no restrictions on length; the second time, they will include location, contact name and address, and reference to original posting.

Submit ads by e-mail or U.S. mail. FAXED ADS ARE NOT ACCEPTED. If you submit a chargeable ad (tenure-track or private company) by e-mail, be certain to include complete billing information. If you mail your ad, include a purchase order or a credit card number, expiration date, and signature.

Deadline for the January/February 1995 issue is December 20, 1994. Submissions must be accompanied by billing information or payment as described above. If you have any questions, contact newsletter editor Jody Carlson, telephone 301-251-0560, ext. 17, fax 301-279-2996, or e-mail jcarlson@access.digex.net.

The *ASPP NEWSLETTER* is distributed to all ASPP members and is published six times annually, in odd-numbered months. It is edited and prepared by ASPP staff from material provided by ASPP members and other interested parties. Copy deadline is about the fifteenth day of the preceding even-numbered month (*e.g.*, December 15 for January/February publication). Submit copy by e-mail whenever possible; submit all other copy by mail, ***not by fax***. Contact: Jody Carlson, Editor, *ASPP NEWSLETTER*, 15501 Monona Drive, Rockville, MD 20855-2768 USA; e-mail jcarlson@access.digex.net; telephone 301-251-0560, ext. 17.

1994-1995 Officers Assume Their Posts

The listing of ASPP officers on page 3 reflects the make up of the new executive committee as old officers rotated off and new officers assumed their responsibilities on October 1.

Now serving the Society as president is James N. Siedow, professor of botany at Duke University. Siedow has served on the executive committee continuously for nearly 10 years. Siedow succeeds Russell Jones, professor of plant biology at the University of California, Berkeley. Jones stays on the executive committee as immediate past president. The new president-elect, joining the executive committee for the first time, is Bob B. Buchanan, also a professor of plant biology at UC-Berkeley. Buchanan will serve the Society as president in 1995-1996. The new elected member of the executive committee is Elizabeth Vierling, University of Arizona. Vierling will serve a three-year term. The members of the Northeast Section of the ASPP have elected Subhash Minocha to a three-year term to represent them.

Rotating off the executive committee are Frank Greene, who had been appointed to fill out the term of Brian Larkins when Larkins became editor of THE PLANT CELL, Bernard Rubinstein, former Northeast Section representative, and Ralph Quatrano, former president. Quatrano will continue to serve the Society as the chair of the public affairs committee that was created during his presidency.

1995 ASPP Committee Assignments Announced

President James Siedow has announced the makeup of ASPP's committees for 1995. Newly named committee members assumed their responsibilities on October 1 and will serve through September 30 of the year listed in parentheses following their names.

Publications Committee
- S. Roux (96), chair
- R. Dixon (95)
- S. Beale (97)
- M. Schuler (98)
- J. Callis (99)

Program Committee
- D. Ort (97), chair
- I. Raskin (95)
- P. Green (96)
- D. T.-H. Ho (97)
- J. Verbeke (98)
- D. Randall (95) , *ex officio*, past chair
- B. Buchanan (95), *ex officio*, president-elect

Nominating Committee
- B. Buchanan (97), chair
- (*ex officio*, president-elect)
- J. Siedow (96)
- (*ex officio*, president)
- R. Jones (95)
- (*ex officio*, past president)

Education Committee
- S. Singer (95), chair
- C. Pike (96)
- D. Blevins (97)
- D. Mandoli (98)
- R. Wise (98)

Constitution & Bylaws Committee
- T. Bjorkman (95), chair
- G. Deitzer (96)
- T. K. Peterman (97)

Committee on the Status of Women in Plant Physiology
- E. Bray (95), chair
- R. Fisher (95)
- A. Harmon (96)
- J. Deikman (96)
- D. Mohnen (97)
- K. Koch (97)

Membership Committee
- G. Hagen, chair
- R. Dobert
- J. Kimpel
- N. Olszewski
- L. Butterfield

Committee on Public Affairs
- R. Quatrano, chair
- M. H. Goldsmith
- R. Goodman
- K. Keegstra
- T. Lomax
- D. Randall
- R. Jones (*ex officio*, past president)

Committee on Minority Affairs
- W. Gordon, chair
- D. Cook
- S. Fennoy
- F. Greene
- E. Orozco
- A. Vasconcelos
- E. Vigil

Corresponding Membership
- M. J. Vesper (95), chair
- R. Dilley (96)
- G. Gardner (97)
- G. Muday (98)

Charles Reid Barnes Life Membership
- J. Boyer (95), chair
- R. Leonard (96)
- S. Bartlett (97)
- A. C. Leopold (95), past winner

Stephen Hales Prize
- E. E. Conn (97), chair
- W. Boss (95)
- J. Key (99)
- W. Briggs (96), past winner

Charles F. Kettering Award
- C. Arntzen (95), chair
- N. E. Tolbert (97)
- R. Malkin (99)
- R. McCarty (96), past winner

Charles Albert Shull Award
- E. Tobin (96), chair
- W. Thompson (98)
- W. Silk (00)
- I. Raskin (95), past winner

Martin Gibbs Medal
- A. Darvill (96), chair
- S. Assmann (98)
- K. Keegstra (00)
- H. Sze (02)
- C. Somerville (95), past winner

Adolph E. Gude, Jr., Award
- A. Läuchli (97), chair
- M. Evans (00)
- H. Grimes (03)
- M. Gibbs (95), past winner

Dennis R. Hoagland Award
- L. Rappaport (03), chair
- M. K. Walker-Simmons (96)
- R. Boston (99)
- C. Arntzen (97), past winner

Excellence in Teaching Award
- P. Williams (95), chair and past winner
- E. N. Kamien (96)
- D. Dalton (99)
- M. Brodl (02)

Shipping Lab Chemicals to Plant Physiologists in Former Soviet Union

Martin Gibbs Reports to the ASPP Membership

This is my second report (see the November/December 1993 issue of the ASPP Newsletter) of the initiative to supply chemicals to colleagues in the former Soviet Union, an initiative that was established during the 1992 annual meeting in Pittsburgh with the allocation of $5,000 by the executive committee. Since then, the executive committee assigned an additional $5,000, and the International Science Foundation awarded $5,000. Ultimately, the major provider of this initiative must be you, the members of ASPP. The executive committee endorsed your direct involvement by approving a space for your contributions on the membership renewal form for 1994 . I am deeply gratified for the generous response of more than $3,000. Direct voluntary contributions for inclusion in the fund to Kenneth Beam, executive director, at ASPP headquarters.

In my first report to the membership at the 1993 Minneapolis meeting, I noted that shipments had been concluded to 39 scientists in nine institutions in Russia and Estonia. I can now report that shipments have been received by the Institute of Soil Science and Photosynthesis, Pushchino; Research Institute of Agricultural Microbiology, St. Petersburg-Pushkin; Siberian Institute for Physiology and Biochemistry of Plants, Irkutsk; and the Bakh Institute of Biochemistry, Moscow. All are located in Russia.

Customs officials, particularly in St. Petersburg, continue to be formidable. Copious documentation included a "humanitarium" aid statement, airway billing number, invoice, customer number, number and weight of packages, and finally the number and date of the "project" authorized by ASPP.

In-country transit remains eventful, particularly from a western carrier to Aeroflot. To assist, intertrans of St. Louis, with an agent based in Moscow, was called in to assure safe conveyance for two packages destined for the Siberian group. After four months of communication between St. Louis, Moscow, Irkutsk, and Waltham, the shipment was dispatched to Chicago by truck and entrusted to Lufthansa. The result: "When I received the parcels, I even cried. All the chemicals we need so much and we begin to use them immediately. About half a year, I and my students tried to determine opines in transformed tissue with silver nitrate but without success and phenanthrenequinones help us at the same day after delivery." And from the Bakh Institute: "We have ultimately overcome customs at the Moscow airport and obtained the chemicals without any additional fee or payment. Thank you for taking the time and trouble to get us just the right things."

Requests are in hand from the Institute of Biology, Kazan,Russia; Institute of Photobiology, Minsk, Belarus; and the Institute of Plant Physiology and Genetics, Kiev, Ukraine. Fulfillment should be less restrictive since direct air service between Germany and these capital cities has been recently established.

Sustentation of this modest international initiative rests with the membership. I am grateful for volunteered identification of qualified plant physiologists within the former Soviet Union. Your interest is essential and welcome.

Martin Gibbs
Brandeis University

OBITUARIES

P. T. H. Brown

We recently received news of the death of P. T. H. Brown of the Long Ashton Research Station in Bristol, England. Dr. Brown joined ASPP in 1991.

William M. Elliott

Dr William M. Elliott, on the faculty of Hartwick College, SUNY-Oneonta, died recently. Dr. Elliott, a member of ASPP since 1967, was born in 1944 in Columbus, Ohio. He graduated from the College of Wooster in 1966 and received his Ph.D. from Syracuse University. He joined the faculty of Hartwick College in 1970. Over 24 years, he taught microbiology to generations of nursing students and introduced many biology majors to the principles of plant physiology and the techniques of electron microscopy. Dr. Elliott was co-host of the 1990 ASPP Northeast Section annual meeting.

PLANT PHYSIOLOGY WILL VENTURE INTO ELECTRONIC PUBLISHING

Plant Gene Register Papers To Be Published Exclusively Online

The enormous success of *Plant Physiology*'s Plant Gene Register as a medium through which to publish information about plant genes has prompted editor Maarten Chrispeels and ASPP to make an important change.

All Plant Gene Register (PGR) papers that are received after January 1, 1995, will be published in electronic form only and will not appear in print in *Plant Physiology*. The manuscripts must be submitted via electronic mail directly to Dr. Paul Staswick, the editor of the Plant Gene Register, at pgr@crcvms.unl.edu and must follow guidelines that will appear in the November and subsequent issues of *Plant Physiology*.

Every month *Plant Physiology* will publish a list of new PGRs that appear in the data base (titles, authors, and affiliations). Authors may use that listing as the official reference (volume, number, year, and page number). This page of the journal will also provide information on how to access the data base. ASPP will charge a reduced handling fee of $100 to process the submissions and will maintain the data base. The corresponding author of each PGR will be billed the $100.

Any PGR papers that arrive at the ASPP editorial office on or after January 1, 1995, will be returned to the authors with a request to submit them in electronic form. PGR papers already accepted and awaiting publication will be printed in *Plant Physiology* in 1995 until the supply is exhausted.

Any questions about these new procedures for handling and publishing PGR papers should be addressed to Deborah Weiner, managing editor of *Plant Physiology*, at telephone 301-251-0560, ext. 18, or e-mail diweiner@access.digex.net.

Fellowships and Traineeships

Undergraduate Summer Research Traineeships in Root Biology
Pennsylvania State University
University Park

Several undergraduate summer traineeships are available at Penn State to participate in an interdisciplinary research training program in advanced root biology starting June-July 1995. Our program is funded by the National Science Foundation and is a unit of the DOE/NSF/USDA Collaborative Research in Plant Biology Fogram. The goal of our program is to train a new group of plant biologists capable of solving the unique conceptual and technical problems presented by plant roots. The undergraduate trainees will be active participants in our group effort, working directly with faculty, postdocs, graduate students, and high school students in a collaborative project of their choice. Projects are available in the following areas: mycorrhizal ecophysiology, molecular biology of *Rhizobium*-root interactions, biochemistry and biology of root exudates, roots and phytoremediation, biosynthesis and biological significance of root-specific secondary metabolites and proteins, biochemistry and molecular biology of root development, and responses to nutrient stress. Research facilities include state-of-the art equipment for plant molecular biology and biotechnology, a newly established Fluorescence Microscopy and Image Analysis facility, a mini-rhizotron, etc. Research opportunities include collaborations with the Rodale Institute Research Center and the USDA Soil Microbiology Systems Laboratory. Financial support includes a $2,500 stipend and $600 for living expenses. Applicants please submit curriculum vitae, transcripts, and three letters of recommendation to Dr. Hector E. Flores, 315 Wartik Laboratory, The Pennsylvania State University, University Park, PA 16802 (telephone 814-865-2955, fax 814-863-1357). Women and minorities are especially encouraged to apply. Deadline for summer research traineeship application: February 28, 1995 (available to U.S. citizens and residents only). (See related postdoctoral fellowship announcement on page 32.)

National Needs Fellowships in Molecular Crop Protection
North Carolina State University, Raleigh

Graduate fellowships for research leading to a Ph.D. degree in botany, entomology, genetics, or plant pathology will be awarded to highly qualified applicants interested in the utilization of biotechnology approaches for protection of crop plants against pathogens and pests. Research areas may include: (1) identification and characterization of genes from plants, insects, and microorganisms, (2) development and analysis of transgenic plants, and (3) the ecological consequences of transgene deployment. Graduate fellowships will carry a stipend of $17,500 a year and are limited to U.S. citizens and permanent residents. Applications should be received by February 15, 1995. For information and application forms contact Dr. Charles H. Opperman, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616; telephone 919-515-6699, fax 919-515-7716.

Graduate Student Assistantship
University of Detroit Mercy
Detroit, Michigan

A graduate assistantship (tuition plus stipend) is available (starting January 1995) for a student interested in investigating the fate of genetically engineered plant genes released into the environment. A qualified student enrolled in the Biology Department's Master of Science program (thesis option) will obtain a teaching assistantship during fall and spring terms (assist in general biology laboratory), and a research assistantship during summer term. For more information and application materials, contact Dr. Stokes S. Baker at Biology Department, University of Detroit Mercy, P.O. Box 19900, Detroit, MI 48219-0900; telephone 313-993-1142.

Katherine Esau
Postdoctoral Fellowships
University of California, Davis

Applications and nominations are invited for Katherine Esau Postdoctoral Fellowships, which will be awarded to outstanding young scientists interested in developing careers in structural aspects of plant biology, including studies in which plant structure is integrated with function. Esau Fellowships will be awarded for a period of two years to enable successful candidates to work under the mentorship of a University of California, Davis faculty member. The Esau Fellowship stipend is commensurate with the NSF plant postdoctoral fellowship program. Applications should include the identification of an appropriate faculty mentor(s), a complete curriculum vitae, reprints of published works, and a proposal (limited to 5 pages) of the research that would be carried out under this program. Applicants will also be required to provide three letters of reference and a letter of commitment of laboratory space from the proposed UC Davis faculty mentor. Please send your completed application to Dr. William J. Lucas, Chair Faculty Advisory Committee, Esau Fellowships Program, Section of Plant Biology, Division of Biological Sciences, University of California, Davis, CA 95616; fax 916-752-5410. Fellowships will be awarded on a bi-annual basis. Deadlines for this ongoing program are June 30 and December 31. The University of California is an equal opportunity employer.

Interdisciplinary Plant Biochemistry Research and Training Center
Washington State University, Pullman

The DOE/NSF/USDA Triagency Program on Collaborative Research in Plant Biology is sponsoring a new five year training grant at Washington State University. The WSU Plant Biochemistry Center was developed to provide training in plant biochemistry and regulatory processes. This program includes thirteen faculty members (G. An, J. Browse, R. Croteau, G. E. Edwards, J. N. S. Evans, V. R. Franceschi, N. G. Lewis, M. L. Kahn, F. A. Loewus, T. W. Okita, C. A.Ryan, L. P. Taylor, M. K. Walker-Simmons) from six different units: Institute of Biological Chemistry, biochemistry/biophysics, botany, genetics and cell biology, crops and soils, and horticulture. The purpose of the program is to provide undergraduate students, graduate students, and postdoctoral associates with a comprehensive and multidisciplinary education in plant biochemistry, including interdisciplinary research activities between physical/biochemical sciences and the traditional plant sciences. Unique

opportunities exist in the program for a combination of formal course offerings, interdisciplinary mentoring, a comprehensive seminar series, industry internships, and a scientific retreat. Positions are available for both graduate students (6) and postdoctoral fellows (4) on a competitive basis. Fellowship recipients must be citizens or permanent residents of the U.S. For more information contact Ms. Tomie Burke, WSU Plant Biochemistry Coordinator, Institute of Biological Chemistry, Washington State University, Pullman WA 99164-6340 (fax 509-335-7643, telephone 509-335-1958, e-mail burkesm@wsuvm1.csc.wsu.edu).

Graduate, Postdoctoral, Sabbatical Training—
Biology of Transgenic Plants
North Carolina State University, Raleigh
DOE/NSF/USDA-sponsored fellowships for graduate students and postdoctoral associates are available at North Carolina State University and Ciba Geigy Agricultural Biotechnology Research Unit to study (1) epigenetic phenomena influencing transgene expression and inheritance and (2) use of transgenic technologies to enhance disease resistance in important crop species. This interdisciplinary program will provide practical training to students, postdoctoral associates, and visiting scientists interested in applying transgenic technology to crop improvement. The program will encompass collaborations among eighteen laboratories with diverse orientations distributed among five departments at North Carolina State University in Raleigh, North Carolina, and Ciba Geigy's Ag Biotech Research Unit, located in Research Triangle Park, North Carolina. The interactions among academic and industrial laboratories will provide a unique training environment in which students will be exposed to multiple steps in the process of technology transfer from fundamental investigations in the laboratory to application in the field. We are seeking applications from potential graduate students and postdoctoral associates who wish to be considered for fellowship support. Further information and application materials may be obtained from: Nicole Burdick, Department of Botany, Box 7612, North Carolina State University, Raleigh, NC 27695-7612; telephone 919-515-2727, fax 91-515-3436; e-mail joyce_bruffey@ncsu.edu. Inquiries from established industrial or academic scientists interested in 3-month "summer sabbaticals" are also encouraged. Review of applications will begin December 15, 1994.

Graduate Research Assistantships and Fellowships
Iowa State University, Ames
Graduate Research Assistantships and Biotechnology Fellowships are available in the Interdepartmental Plant Physiology Major (IPPM) at Iowa State University beginning summer or fall, 1995. IPPM provides research opportunities in plant molecular biology and physiology stressing the development of a strong background in fundamental biology, biochemistry, and molecular biology. Possible areas of research include photosynthesis, genome organization, molecular virology, embryogenesis, mitochondrial function, plant development, organelle biogenesis, host-pathogen interactions, signal transduction, gene expression, plant responses to environmental stress, and lipid metabolism. For more information, contact Dr. Richard Shibles, IPPM, 1557 Agronomy Bldg., Iowa State University, Ames, IA 50011. Iowa State University is an equal opportunity/affirmative action employer.

Graduate Research Assistantships
Purdue University
West Lafayette, Indiana
Research assistantships in the Department of Horticulture are available to qualified students beginning summer or fall 1995. Potential research projects and sponsoring professors include: mechanisms of freezing injury and temperature acclimation in plants—E. Ashworth; integrated crop management of grapes and small fruit, mechanisms of cold hardiness and disease resistance in grapes—B. Bordelon; isolation and characterization of genes involved in resistance to insects and diseases, and adaptation of plants to osmotic stress—R. Bressan; establishment and culture of native herbaceous landscape plants—M. Dana; adaptive responses of plants to heavy metals, and regulation of plant metallothionein genes—P. Goldsbrough; growth and development of floriculture crops, plant growth modeling, and computer applications in horticulture—P. A. Hammer; molecular biology of fruit ripening—A. Handa; molecular basis for osmotic adaptation in plants and host plant pest and pathogen resistance, transformation—P.M. Hasegawa; new crops and fruit breeding—J. Janick; physiological adaptations to drought and salinity stress—R. Joly; yield optimization for the NASA-sponsored Controlled Ecological Life-Support System (CELSS) program, and the physiology of mechanical stress—C. Mitchell; molecular biology of plant nutrition—K C. Raghothama; biochemistry and genetics of stress-induced proline and glycinebetaine accumulation in plants—D. Rhodes; chemistry and physiology of aromatic and medicinal plants, and new crops development—J. Simon; expert systems management, economics, and marketing—G. Sullivan; biochemical effects of herbicides on plants, and biology of problem weeds—S. Weller; and postharvest physiology and molecular biology of flower crops—W.R. Woodson. Master's degree programs are administered through the Department of Horticulture. Ph.D. programs are administered through either the Department of Horticulture or the Purdue University Plant Physiology Program. Annual stipends range from $12,000 to $15,000 plus $400 travel allowance to participate at professional meetings. Stipend includes a waiver of tuition and fees, except for a $253 per semester student fee. For additional information/application materials, contact the faculty member whose name is listed by the research area of interest, or contact the Student Services Coordinator, Department of Horticulture, Purdue University, 1165 Horticulture Building, West Lafayette, IN 47907-1165; telephone 317-494-1302. Purdue University is an equal opportunity/equal access university.

Deadline for the

January/February 1995 issue

of the

ASPP Newsletter

is December 20, 1994.

SECTION NEWS

Midwestern Section

The annual meeting of the MWASPP will be held April 7-8, 1995, at the Kellogg Center on the campus of Michigan State University in East Lansing. Details of the meeting will be announced in the section's newsletter, which will be distributed in January. At that time, nominations for sectional officers will be solicited. All MWASPP members are encouraged to communicate their e-mail addresses to the Sectional Secretary/Treasurer to facilitate creation of an MWASPP e-mail network. For further information, contact: Ray Zielinski, Secretary/Treasurer MWASPP, Department of Plant Biology, University of Illinois, 1201 W. Gregory Dr., Urbana, IL 61801; telephone 217-333-6785, fax 217-244-1336, e-mail rez@uiuc.edu.

Mike Robinson (left) and Doug Luster (far right) cooked hamburgers and hot dogs. Left to right, Rob Donaldson, Nat Wolins, and Jim Saunders wait impatiently. WAS-ASPP secretary-treasurer Janet Slovin (not shown) made this one of the most enjoyable crab feasts.

Southern Section

The 1995 meeting of the Southern Section of ASPP will be held March 18-20 at the University of Tennessee Conference Center in Knoxville. The meeting will include a symposium entitled "Cellular Mechanisms for Surviving Protoplasmic Water Loss." Make plans now to attend. There will be a mixer the evening of March 18 at the Holiday Inn World's Fair at the Convention Center, where a block of sleeping rooms has been reserved. Further details on the meeting are forthcoming.

Northeast Section

The Northeast Section of ASPP will meet April 28-29, 1995, at the University of Rhode Island, Kingston, Rhode Island. The meeting will be jointly hosted by Richard Hull and Alison Roberts. The organizers are planning a symnposium on the general theme of plant-microbe interactions. Additional information will be mailed to members of the Northeast Section, or those interested can contact either Dr. Hull (telephone 401-792-5995, fax 401-792-4017) or Dr. Roberts (telephone 401-792-4098, fax 401-792-5974, e-mail awroberts@uriacc.uri.edu) directly.

Members enjoy drinks and conversation before the annual crab feast held this fall at ASPP headquarters. Left to right, WAS section ASPP members Gideon Schaeffer, Steve Britz, and Kit Streusand-Goldman, and executive director of ASPP, Ken Beam. (Photos by Heven Sze, chair of WAS-ASPP.)

Washington Area Section

WAS-ASPP held its annual crab feast on the grounds of ASPP headquarters in Rockville, Maryland, on September 30. The evening was set aside for fun and food and friends—with a dollop of music thrown into the mix. Several representatives of the ASPP headquarters staff joined with a sizeable group of section members for a pleasant and relaxing evening. Some photos from the evening appear on this page.

Give generously to the new ASPP Education Foundation.

It's easy to do on your membership renewal form.

See page 35 for the purposes and aims and of the Foundation.

Public Affairs

WORKSHOP PROMOTES DIALOGUE BETWEEN FUNDAMENTAL SCIENCE AND SUSTAINABLE AG COMMUNITY

A Workshop on Research in Support of Sustainable Agriculture supported by USDA and coordinated by the American Institute of Biological Sciences (AIBS) was held in Raleigh, North Carolina, October 20-21.

The workshop brought together by invitation representatives of science societies (primarily plant science societies) and sustainable agriculture centers. The workshop represented an effort by the science community to reach out to work with sustainable agriculture representatives to further define the interests of the participants and increase the opportunity for dialogue. Sustainable agriculture centers have been actively seeking from Congress and USDA a major redirection of funds toward research contributing to sustainable agriculture.

There were nearly 50 participants including the following members of ASPP—Kenneth Keegstra, a member of the workshop steering committee; Clarence (Bud) Ryan, speaker on fundamental research; James Siedow, ASPP president and Ralph Quatrano, chair of the ASPP public affairs committee. Ken Beam, ASPP executive director, and Brian Hyps, ASPP public affairs director, also attended.

Among the many attendees from the sustainable agriculture community were Garth Youngberg and Kitty Smith from the Henry A. Wallace Institute for Alternative Agriculture, Elizabeth Bird from the Center for Rural Affairs, Laurie Drinkwater from the Rodale Institute Research Center, and Margaret Mellon, Director of the Agricultural and Biotechnology Project, Union of Concerned Scientists. The workshop was first proposed by National Research Initiative Competitive Grants Program Chief Scientist Jim Cook at a Plant and Soil Sciences Forum meeting coordinated by ASPP in December.

Ryan's presentation explained how small, incremental gains in knowledge acquired through fundamental research can lead to major breakthroughs sometimes via unexpected routes. He gave examples of research that could extend as long as 30 to 40 years that will suddenly have new practical applications in plants through new discoveries. He explained how new developments in biotechnology have made use of earlier knowledge to breed plants that are naturally resistant to pests and disease. With less need for chemical inputs, these plants can contribute to sustainable agriculture.

In his presentation, Youngberg reviewed a history of sustainable agriculture. He explained earlier efforts to gain support for organic farming dating back to the early 1970s. He said an organic farming report was not widely accepted by the broader agricultural community and was later dismissed within USDA. However, when the language of "sustainability" was introduced, it helped foster a dialogue. The broader agricultural community paid more attention to the term "sustainability" than it did to the term "organic." He pointed to acceptance of sustainability in the 1990 Farm Bill with some variance of understanding of the term. He asked how many definitions of sustainable agriculture there would be for the 1995 Farm Bill. He suggested that it was now time for a dialogue for a definition of sustainable agriculture.

Cook explained in his presentation the interface between sustainable agriculture and NRI research. He reviewed the economic, ecological, and sociological components of research contributing to sustainable agriculture. His examples illustrated how research contributing to one component may somehow detract from another. For example, scientific research helped chicken farmers counter a devastating chicken disease, but this breakthrough also made it easier to vertically integrate chicken farming operations which had an adverse impact on some small-scale chicken farmers. At the same time, this vertical integration contributed to the quality of life of the general American consumer by providing access to more affordable, high quality white meat.

The next step resulting from the workshop is the writing of a summary of the meeting which will be done by Clifford Gabriel of AIBS with input from Keegstra and other steering committee members and participants at the meeting. The summary is expected to be circulated among offices in Congress and the Executive Branch. The summary will also be published in *BioScience*, a publication of AIBS.

NSF Asked To Place Strategic Emphasis on Plants, Biodiversity

The electronic information highway traveled from National Science Foundation director Neal Lane to Gloria Coruzzi, a member of the ASPP public affairs committee, during an electronic town meeting on October 24. Coruzzi was selected by New York University to represent biology in the interactive electronic meeting with Lane who was across the state at Cornell. Lane was connected to NYU and a number of other universities by computer with both video and audio hook up for a "live-on-camera" interactive exchange.

Written questions were submitted to Lane by e-mail in advance of the town meeting. For the "live" question and answer period, Coruzzi merged a question on biodiversity she submitted on behalf of Chris Field of the Carnegie Institution of Washington with her own question on the importance of including biological systems in new strategic goals.

When she was selected by the moderator to ask a question, Coruzzi asked the following:

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Arabidopsis plants (shown here with Dr. Gloria Coruzzi) figured in her discussion with National Science Foundation director Neal Lane. Lane thanked Coruzzi for mentioning NSF's support for Arabidopsis research.

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"Where does biology fit into the picture of the new strategic aims? While the new strategic aim, 'global change' justly includes earth, oceanic, and atmospheric science, what seems to be missing is biology and the environment. Maintenance of biodiversity is a priority from at least three perspectives—(l) economic, (2) ethical, and (3) ecosystem function; all depend on biodiversity. A few clear examples where biological research has tremendous impact on the global environment include: plant biology and tropical biodiversity, creating genetically engineered microorganisms or plants for bioremediation, identification of chemical/pharmaceutical products in plants, microbes, and insects. Many more examples exist and many more animal, microbial and plant biological systems should be included under the strategic aim called 'global change'.

"You said that NSF's funding approach would be based on a French philosophers' notion that to best lead a group you should first find out where that group is going and then lead it. NSF has used this approach in the past in the field of plant biology where they recognized an emerging area within the plant community and took the lead in funding Arabidopsis research. Defining new and emerging areas within a field is great; however, it is necessary to define strategic areas which include a diversity of biological systems."

Lane said Coruzzi was correct in citing the importance of plants and many other organisms to global change. He said NSF needs to broaden its definition of the strategic aims to include these areas of biological research. He added that some plant funding would come from tri-agency funding. With regard to biodiversity, Lane said that NSF needs to make changes in this area to better support funding of biodiversity studies. Lane thanked Coruzzi for mentioning the NSF support of the Arabidopsis research. He pointed out the special importance of Arabidopsis due to its small genome. Lane added that he has an Arabidopsis plant in his office that he has been trying to keep alive.

Lane, a strong supporter of fundamental research, has pointed out in past presentations that one of his most important jobs as NSF director is to make a sales pitch to Congress and the American people. He noted that he has to convince them that NSF is a good investment.

"This is just the same as when you or I are considering investing in a mutual fund or buying stock. A mutual fund whose prospectus says it expects returns based on luck, curiosity, [and] serendipity . . . probably won't attract very many investors.

National Science Foundation director Neal Lane.

"What does make a good investment strategy is the one outlined in *Science in the National Interest*. Science is an endless resource for our society and for future generations. It is essential to improving our economy, our environment, our health, our national security, and our quality of life. Through our efforts every day in research and education, each of us helps to provide society with the knowledge, the capability, and the determination to realize the benefits of science and technology," Lane said.

Lane explained that *Science in the National Interest*, the first Presidential level statement on science policy in 15 years, presents a policy framework that is built around five broad goals:

1. Maintain effective leadership across the frontiers of scientific knowledge.
2. Enhance connections between fundamental research and national goals.
3. Stimulate partnerships that promote investments in fundamental science and engineering and the effective use of physical, human, and financial resources.
4. Produce the finest scientists and engineers for the twenty-first century.
5. Raise the scientific and technical literacy of all Americans.

Lane noted that with regard to NSF initiatives in strategic areas of research and education, such as advanced manufacturing, high performance computing and communications, global change, and science, mathematics, engineering and technology education, the fundamental nature, quality and educational impact of the work supported in these areas is entirely consistent with other activities supported by the Foundation.

NRI FUNDING AT $103 MILLION FOR FY 95

The National Research Initiative Competitive Grants Program (NRICGP) has funds for Fiscal Year 1995 of more than $103 million, which reflects a drop of more than $2 million (about two percent) from the FY 94 appropriation. The NRICGP appropriation reflects to a milder degree the reductions that hit other discretionary programs in the agriculture budget.

Discretionary programs, which have $13.4 billion in funding for FY 1995, were cut by nearly $1.2 billion (or about seven percent) from the FY 1994 budget. (These figures show that other discretionary programs were cut on average more than three times greater than the percentage reduction for NRI as federal budget deficit reduction efforts battered the agriculture budget.)

In summing up his views of FY 95 appropriations on the House Floor, House Appropriations Subcommittee on Agriculture ranking member Joe Skeen (R-NM) cited growth of the mandatory programs' share of the agriculture budget as a threat to discretionary programs. "The discretionary spending makes up less than 20 percent of the total spending, meaning that mandated programs represent 80 percent of our spending . . . . The mandatory entitlement programs continue to increase at an out-of-control rate. This bill's mandatory spending continues to gobble up more of the discretionary programs, including Women, Infants and Children (WIC—a nutritional program), Agricultural Research, export and conservation programs, which is why Congress and the Administration need to fight for expeditious consideration of entitlement reform . . . . The committee made sure that the Food and Safety Inspection Service, Agricultural Research Service, Food and Nutrition Service, and the Animal and Plant Health Inspection Service were among the agencies that were virtually fully funded. These are for the protection of the consumers of this country and for the entire world for that matter, because we are a provider of foodstuffs to almost the entire world.

"WIC, Agricultural Research, Federal Crop Insurance Corporation, and disaster assistance payments were also given high priority. On the other hand we were forced to cut some very popular programs: Farmer's Home Administration Section 502 and 515 loan programs on housing were necessary for us to cut. The . . . temporary emergency food assistance program [TEFAP] is a very popular program among the some 26 nutritional programs that we deal in year in and year out, and the export programs, including the market promotion program, were cut in order to get below our budgetary caps. While the spending for those programs is lean, it is also responsible under these tough budget times and the parameters under which we have to work on the money situation.

"The conference report makes sure that federal spending will continue to ensure that our food is the safest, healthiest, and cheapest food in the world. Spending for research helps our farmers compete and remain the most productive anywhere in the world. We are going to continue to feed the hungry here at home and abroad as we have done consistently throughout our history. This is what this conference report is all about. This is responsible federal spending, but it getting tougher and tougher as the discretionary money continues to decline."

Rep. John Myers (R-IN), also a member of the House Appropriations Subcommittee on Agriculture, explained his concerns with reduction of agricultural research funding. "I believe in a balanced budget, but we cut agriculture research in this bill. If there is any place where a farmer can be helped today, it is finding better production methods, more use for agricultural products, so we can get a better price for the product we produce. And this is being cut in this bill. This is not a fault of the committee, but a fault of the allocation system . . . . We simply have to cut down the mandated section, so we will have more opportunity to help the farm producer out there who is suffering today."

Rep. Doug Bereuter (R-NE) noted that, "Unfortunately, this entitlement spending does not represent an investment in the future of the agricultural industry. Instead, Mr. Speaker, cuts in discretionary spending programs like basic agricultural research at universities across the country, watershed and flood prevention operations, and agricultural export promotion represent a serious lack of investment in the future of the agricultural industry." Bereuter added that the FY 1995 appropriation "drastically reduces funding for the Soil Conservation Service and many other important soil and water conservation programs including: flood prevention, cut from Fiscal Year 1994, $221 million to $70 million; Agriculture Conservation Program, cut from Fiscal Year 1994, $195 million to $100 million; and Water Quality Incentive Program, cut from Fiscal Year 1994, $18.5 million to $15 million."

Rep. Joseph McDade (R-PA), ranking minority member of the Appropriations Committee, commended chairman Richard Durbin (D-IL) and Skeen "for their continued fight to preserve vital agricultural research funding. Where for such a small dollar investment of under a billion dollars in federal spending the returns for higher quality and disease and insect reductions for crops is more than three times the pay back benefit."

McDade discussed the growing imbalance of spending on mandatory programs. "Mandatory spending on food stamps is increased by $600 million for a total of $28.9 billion."

The Conference Report was adopted by the House on September 23 and by the Senate on September 27. The President signed the legislation into Public Law 103-330 on September 30.

A number of ASPP members contacted their members of Congress on the Appropriations Committee in support of NRICGP. Ralph Quatrano, chair of the ASPP committee on public affairs, testified in support of NRICGP before Durbin, Skeen, and Myers at the House Appropriations Subcommittee on Agriculture hearing on FY 95 appropriations. Quatrano and James Siedow, ASPP president, also met earlier this year with Rep. David Price (D-NC), a member of the Appropriations Committee who supports agricultural research.

Overall federal budget deficit reduction targets, unless they are changed, are expected to place greater constraints on the FY 1996 budget. ASPP members will need to work with their members of Congress to protect agricultural research funding in the 1996 budget.

USDA Begins To Implement Reorganization

Following passage of legislation by Congress to reorganize the U.S. Department of Agriculture, Secretary of Agriculture Mike Espy signed orders October 20 that begin implementation of the reorganization.

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The reorganization creates a new Under Secretary of Agriculture for Research, Education and Economics with jurisdiction over these areas: the Agricultural Research Service, Economic Research Service, National Agricultural Statistics Service, and the Cooperative State Research, Education and Extension Service. The Cooperative State Research, Education and Extension Service will perform "functions related to cooperative state research programs and cooperative extension and education programs that are under the jurisdiction of the Department," according to the reorganization legislation passed by Congress.

The officer in charge of the Cooperative State Research, Education and Extension Service shall report directly to the Under Secretary of Agriculture for Research, Education, and Economics. The National Research Initiative Competitive Grants Program (NRICGP) is within the Cooperative State Research, Education, and Extension Service.

NRICGP Chief Scientist Jim Cook said the competitive grants program will be able to work effectively under the new structure. He praised the appointment of William Carlson as acting administrator of the Cooperative State Research, Education and Extension Service. Carlson has been the associate administrator of the Office of Grants and Program Systems within the Cooperative State Research Service.

Espy named R. D. Plowman as Acting Under Secretary of Agriculture for Research, Education and Economics. Plowman has been Acting Assistant Secretary for Science and Education.

ASPP Recommends Hazardous Waste Remediation Technologies to DOE

Following are the comments submitted September 29 by ASPP to a request for information published by the Department of Energy concerning new and innovative technologies in waste characterization, treatment, remediation, storage, and disposal:

This letter responds to the Office of Envi-

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ASPP Comments on Policy Approaches for the Farm Bill

On September 30, ASPP submitted recommendations to the chairman and the ranking minority member of the Senate Committee on Agriculture, Nutrition and Forestry in response to their request for input on agricultural and related programs. Chairman Patrick Leahy (D-VT) and ranking minority member Richard Lugar (R-IN) were seeking information on the potential need for new policy approaches that should be examined in the 1995 Farm Bill.

ASPP president Russell Jones (now past president) explained in the comments the need for reauthorization of the National Research Initiative Competitive Grants Program (NRICGP). He also discussed the importance to American farmers of an accurate definition for sustainable agriculture. Jones cited the key role of NRICGP and agricultural research in keeping American farmers competitive.

"What happens to an industry when its science and technology base is surpassed by global competitors?" Jones asked in the comments. "Generally, the nation with the less developed science and technology base faces relatively lower productivity, fewer exports, and increased imports in that sector. We know of no exceptions that would prevent the demise of our agricultural sector as the U.S. agriculture research base is surpassed by global competitors. This has ominous implications for the nation's balance of trade, which depends on a healthy trade surplus in the agricultural sector. America's farmers, large and small, will face yet another crisis as other, technologically superior nations reduce their imports from the U.S. and increase their exports. The higher standard of living that Americans enjoy from our agricultural sector's leadership in providing the highest quality, affordable food will be threatened when scientific and technological capabilities in our agricultural sector weaken relative to other nations.

"*Science in the National Interest*, released recently by Vice President Gore, cites the nation's goal of world leadership in scientific knowledge. The policy document notes that the U.S. should raise its total spending on research and development from 2.6 percent of gross domestic product to approximately 3 percent. The document's recognition of an interdependence of basic research, applied research and technology is reflected well in the role of the NRI as authorized in the 1990 Farm Bill. Basic and applied research supported by the NRI lead to the development of important new technologies to assist America's farmers and consumers. The competitive, peer-reviewed nature of NRI grant awards helps assure that the best research proposals are funded," Jones added.

The comments pointed out that a memo prepared this year by the Office of Science and Technology Policy and the Office of Management and Budget cites the need for a "measurable increase" in spending on peer-reviewed, academic research by federal agencies. The Committee's authorization of NRI directly meets this need, Jones noted.

"We encourage the committee to reaffirm its strong support of the NRI in the 1995 Farm Bill. This is the essential step needed if the U.S. will have an opportunity to maintain a strong position in agriculture among world competitors," Jones said.

With regard to sustainable agriculture, Jones pointed out that there has been considerable discussion in recent years over interpretation of the 1990 Farm Bill provisions relating to sustainable agriculture. He said ASPP strongly supports the practice of sustainable agriculture.

"Fundamental and applied research using plant biotechnology and other modern technologies offer significant opportunities for advancements in the practice of sustainable agriculture," Jones commented.

Jones said that research contributing to sustainable agriculture is not limited to research related to organic farming. "Our interpretation of the 1990 Farm Bill does not limit sustainable agriculture to organic farming practices. American farmers, large and small, denied the most advanced technologies in farming because of organic farming criteria limitations on the most promising research available to them will face another hurdle in their ability to both compete in the world market and to sustain agricultural resources," Jones said. He encouraged the committee to work closely with ASPP and the rest of the science community in defining the contribution of research to sustainable agriculture.

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ronmental Management's request for information (RFI) concerning new and innovative technologies that may accelerate or enhance site activities in characterization, treatment, remediation, and storage/disposal of hazardous waste or mixed (radioactive/hazardous) waste.

The American Society of Plant Physiologists (ASPP) is a non-profit association made up of more than 5,300 academic, government and industry plant science researchers and teachers from the United States and more than 50 other nations. These comments are submitted to provide information on emerging technologies recognized within the society which may contribute to remediation of sites contaminated by hazardous wastes. ASPP is not a private firm and it will not experience financial gain if a federal agency contracts for use of the technologies discussed in these comments.

A new technology called "phytoremediation" involves the use of specially selected plants to extract toxic metals from soil and water at high concentrations. Toxic metals such as zinc and cadmium can be drawn into the roots and shoots of the plants at a much higher rate than other plants. Zinc-contaminated soil can be fatal to grazing horses. Cadmium-contaminated soil can cause kidney disease in humans and, in rare cases, multiple fractures in humans because of inhibition of calcium absorption.

Dr. Rufus L. Chaney, research agronomist at the U.S. Department of Agriculture in Beltsville, Maryland, was the first U.S. researcher who published the idea of using plants to clean up toxic metal wastes. Dr. Chaney is working with a plant, alpine pennycress, which strips cadmium out of the soil at a much higher rate than other plants. Dr. Chaney plans to work with alpine pennycress and canola hay to bioengineer hay which would absorb large amounts of cadmium and zinc. This would enable a hay crop to selectively remove toxic metals from the soil, then be burned for biomass energy. After the hay is burned, the concentrated metals in ash, up to 40 percent zinc, could be recycled for commercial use.

Dr. Chaney said the same technology may be applied to remove radioactive elements from contaminated soil. Appropriate plant species must be identified to clean up soil contaminated with radioactive elements.

Dr. Ilya Raskin, professor at Rutgers University, has been conducting phytoremediation field tests on radioactive contaminated soil in Ukraine. Dr. Raskin has also found that mustard plants can accumulate toxic metals until they are 3.5 percent of the dry weight of the shoots and 20 percent of the dried roots. Early work is also being done to engineer plants through use of biotechnology to take up even higher concentrations of metals. Dr. Raskin, who is working with a corporate sponsor, said phytoremediation may be only three years away from commercial use.

The conventional treatment of toxic metal-contaminated soil costs as much as $1,000 per ton of soil. Treating sites with phytoremediation will cost an estimated $15-$50 per ton of soil.

On August 2, 1994, ASPP sponsored a small symposium on phytoremediation during its annual meeting in Portland, Oregon. Dr. Chaney and Dr. Raskin were among the presenters. A workshop on phytoremediation research needs was held July 24-26, 1994, in Santa Rosa, California sponsored jointly by the Department of Energy Division of Energy Biosciences and Office of Environmental Management. The objective of the workshop was to define critical research needs of both basic and applied nature that would have substantial effects on the use of plants in bioremediation.

Discussions focused on use of plants to take up heavy metals and the mineralization of organic solvents in soils, sediments and plants. Dr. Chaney and Dr. Raskin were among many researchers who participated. We commend the Department for bringing leading researchers together for this workshop.

Dr. Bob Buchanan, professor at the University of California, Berkeley, and senior staff scientist, Energy and Environment Division, Lawrence Berkeley Laboratory, has initiated a research program in bioremediation—the use of microorganisms to clean up contaminated sites. Buchanan and his colleagues have described a bacterial system for the detoxification of selenite, a major toxic form of selenium. The system is being tested in collaboration with Exxon Corp. for the removal of selenite from oil refinery waste streams. Buchanan's system is also a central component of a 25,000-gallon-per-day pilot facility being built in California's San Joaquin Valley to remove selenate, another toxic species of selenium."

In a related project, just getting started, Buchanan is working with colleagues at UC Berkeley, Lawrence Livermore Laboratory, and Lawrence Berkeley Laboratory to develop and apply technologies (including those based on plants) for the cleanup of metals and organics at the Naval Air Station at Alameda. President Clinton has designated the soon-to-be-closed Alameda base a national demonstration site for fast track cleanup. Finally, in collaboration with colleagues at UC Berkeley and the Lawrence Berkeley Laboratory, Buchanan is exploiting isotope fractionation analysis as a possible new method to monitor in situ bioremediation and phytoremediation activities. Such a method is needed as there is currently no quantitative means for assessing the contribution of biological systems to the disappearance of pollutants from the environment.

The phytoremediation and bioremediation approaches discussed in these comments have demonstrated their ability to alleviate risks to public health and safety and to the environment. The use of these technologies for cleaning up contaminated sites has an almost certain prospect of public acceptance. For example, use of plants to clean up contaminated soil is far less disruptive to the environment than other conventional methods of cleanup. With phytoremediation, one avoids disruptive excavation and the noisy heavy equipment and truck traffic accompanying excavation. The need for disposal sites and restoration of excavated sites is also greatly alleviated. Instead, contaminated soil would be cleaned quietly by plants growing unobtrusively in a field. The cost effectiveness and environmentally benign nature of this approach could make it possible for much larger scale cleanups than are currently economically feasible.

ASPP commends the Office of Environmental Management for issuing this RFI. We hope that these comments are useful in the Office of Environmental Management's review of new and innovative technologies that may accelerate or enhance site activities treating contaminated soil. Please let us know if we can provide additional information.

Sincerely,
Russell L. Jones
President

ASPP Education Forum

Compiled this issue by Carl Pike, Department of Biology, Franklin and Marshall College, Lancaster, PA 17604 e-mail <c_pike@acad.fandm.edu>.

Workshops on Grants and Jobs at 1995 Annual Meeting

The Education Committee is organizing two workshops for the Society's meeting this summer. The topics were chosen to appeal to a broad spectrum of members.

A representative from NSF will lead a workshop on educational grants, including a description of the many education-oriented NSF programs (at all levels, from elementary through college) and information on how to write an educational grant (which is quite different from a research grant).

To address the interests of grad students and postdocs, a panel session will examine the wide range of career options for plant physiologists. People employed at various types of colleges and universities as well as industry and government scientists will comment on their career choices; an extensive question-and-answer session is planned.

Watch for further details in the meeting program.

ASPP To Participate in International Science Teachers Meeting—Ideas Needed

ASPP has accepted an invitation from the National Science Teachers Association to present one or more one-hour workshop sessions at their 1996 International Convention on Science and Science Education in San Francisco. The Education Committee's goal for this and other activities is to make plants a much more central part of elementary and secondary science education. Too many students receive minimal experience with plants, and that creates problems at the college level. Our participation in this meeting will provide an opportunity to reach a large number of teachers (an attendance of 10,000 is expected).

We are sure that ASPP members have many projects (perhaps already classroom-tested) that could provide the basis for our sessions. We encourage you to send us your ideas. That is *not* a commitment to actually run the workshop; the committee will bear that responsibility. (We anticipate that a separate Fast Plants workshop will be conducted; we need other ideas.)

A successful lab presentation at the workshop will enable teachers to implement an innovative activity in their classrooms. The activity should, if possible, illustrate important biological principles and allow the students to formulate and test their own hypotheses. Given the time lag for new discoveries to be incorporated into textbooks, projects on exciting current topics would surely appeal to students and teachers. Keep in mind that most schools have limited equipment, and in many cases lab periods are only 45 minutes long, so experiments may have to be divided into several blocks of time.

We need your ideas now because we hope to pre-test our presentation at the 1995 and 1996 ASPP meetings; workshops for local teachers will be scheduled.

Computers and the Internet in Education

As computers and Internet access become routinely available to undergraduates, the opportunities to develop applications for courses increase. In this column I will review computer-related activities at the 1994 annual meeting and indicate some examples I've encountered of plant physiologists' use of these tools in their classes.

Katie Clark from Purdue provided an opportunity for visitors to the Education Booth to explore Internet resources for biology and plant physiology. She prepared a detailed handout on Internet access and resources. If you would like a copy, send an e-mail message to her at: <flora@sage.cc.purdue.edu> with the text <Request: Plant Physiology Gopherhole List>. We thank Katie for her great investment of time in this project.

A good Internet resource is "The Biologist's Guide to the Internet," prepared by Una Smith. This is available by sending the text <send pub/usenet/sci.answers/biology/guide/*> to the e-mail address <mail-server@rtfm.mit.edu>.

David Finkelstein of Texas A&M had a poster on his hypertext program (DEPTH) that explains the hormone concept. The program has three different levels of detail and includes an extensive list of references. Contact: Dr. David Finkelstein, Department of Forest Science, Texas A&M University, College Station, TX 77843-2135.

Jon Monroe of James Madison University, Harrisonburg, Virginia, presented a poster on his semester-long plant physiology course research project involving isolation and characterization of *Arabidopsis* mutants. A key component of the students' work was access to the *Arabidopsis* data bases to learn if mutants similar to those they found had previously been described. In this way, the students learned the key role that these electronic resources play in biological research; this is yet another tool that undergraduates need to learn in order to be ready for graduate school.

We all worry about getting students actively involved in their learning. This can be a particular problem in large introductory courses. While the computer might not seem to be a device to break down student/teacher barriers, some people have found the opposite to be true. Students today regard the computer as a way to add a personal touch to a large course.

There is much evidence that students who work together, solving problems, discussing theories, etc., perform better than those who work alone. As a supplement to the traditional "study groups," computer network-based conversations can help get students actively thinking about their work. Phil Kesten, a physicist at Santa Clara University, has written a program for an electronic study group. He found it very successful in engendering interactions among students, including tutoring. He also requires each student to send to their on-line study group partners and to him a brief message after each lecture, discussing or explaining some aspect of the lecture. The process encourages students to interact with one another and to "process

material through their own vocabulary and imagery; until this happens I believe the knowledge remains mine—they have only borrowed it." Student feedback has been very positive.

As another tool to help instructors get to know students early in the semester, Joe Pelliccia at Bates College requires students to send at least one e-mail message a week to the instructor. The message can just be a comment about a lecture or a request for clarification of a difficult concept.

Given the difficulty of finding office hour times that are convenient to faculty and all students, several people are using "electronic office hours." Dave Husic at Lafayette finds that all students benefit when he posts student questions and his answers.

Walter Ogston at Kalamazoo College has developed a system that enables "students [to] make their own choices about what study and learn, which is how real science works." He assigns the writing of a series of 2-3 page papers on a topic of the students' choice, based on reading of journal articles. The students must use on-line bibliographic searching to find papers and must follow a particular line of investigation through the term. His goal is to reduce "the factual content that students are expected to absorb while teaching them to work comfortably with an indefinitely large and constantly expanding body of knowledge." Students studying related topics are put together in discussion groups. He finds that there are significant benefits to the instructor of electronic submission of papers: "The whole of each student's work is archived in one file, with my comments, so it is easy to check on their progress. I find the discipline of having to write coherent feedback, rather than scrawling with a pencil in the margin, makes me think about and evaluate the students' work carefully. In course evaluations most students are very positive about the exercise as a whole; they feel that it enables them to become expert in a subject, and gives them control of the learning process."

As an occasional feature of the Education Forum , we would like to include additional examples of innovative uses of computer technology. Please send information to Carl Pike. In particular, examples of computer simulations of plant processes would be very valuable to members of the society. The Project Bioquest modules have received widespread acclaim, but none cover topics in plant physiology.

We Want You . . for the 1995 Education Booth

Do you have a laboratory project or a computer program that you'd like the world to know about? The Education Booth provides the place! We have some money available to defray the costs of supplies, computers, transportation, etc. Please send ideas to Carl Pike. We'd like to include these demonstrations in the meeting program, so remember that the deadline for meeting abstracts is February 28, 1995. If possible, the education section posters will be located near the booth this year.

Results of Survey on Outreach Efforts

Forty-eight society members offered their teaching views, input, and advice on the ASPP Education Survey circulated at the 1994 meetings in Portland. It is obvious from the results that many of our members, in addition to their job responsibilities, are heavily involved in a variety of teaching experiences outside of the university classroom. Involvements in formal, externally funded programs sponsored by the USDA, Howard Hughes Medical Institute, and NSF were listed by members as well as more grass roots volunteer efforts such as high school science projects and lectures to local civic groups. Programs aimed at traditionally under-represented groups were noted as being particularly successful in enhancing access to scientific training.

Several respondents identified needs and made suggestions of how to increase the effectiveness of their outreach teaching efforts. Some simple hydroponics experiments made from easily available materials for high school biology labs would be of interest to one member. [Note: David Hershey at Maryland has written about such systems and demonstrated them at the ASPP Education Booth.] Another noted the absence of a good textbook for teaching plant science to fifth and sixth graders. [Note: That's probably a problem at all grade levels!] Yet another offered the advice that it is absolutely essential that one or more key teachers be involved in the planning of any successful outreach program.

The ASPP Education Committee is using the survey results to help guide it in designing programs to enhance the role of the Society in all aspects of science education. Those efforts will be discussed in this forum in future newsletters. If you wish to provide further input, please contact any member of the Education Committee or the ASPP office.

The Plant-Ed Bulletin Board Is Up and Running

In just a short time, nearly 200 plant biologists have subscribed to the plant education computer bulletin board. More importantly, there is significant, interesting traffic, which is of value to plant physiologists at both the graduate and undergraduate levels. Some examples of recent exchanges include: a request for information on ways to increase student interest in labs on wood anatomy, which led to nearly a dozen replies within a couple of days; an exchange of protocols for isolating DNA from plant tissues for classroom demonstrations (including high school); and an exchange about problem-based learning, such as the "decision case studies" used in the Agronomy and Plant Genetics department of the University of Minnesota. A graduate department posted information about its Ph.D. program to be circulated to potential applicants. There has been much discussion about effective ways to teach about plants in introductory courses, especially when plant biology is incorporated into a general biology course.

The operation and purposes of the bulletin board were described in this column in the September/October issue of the ASPP Newsletter. To subscribe to the bulletin board, send the message <subscribe plant-ed> to <biosci-server@net.bio.net>.

Request To Help an Urban Science Teacher

Bennett Brown graduated from MIT three years ago and began teaching science at DuSable High School in Chicago. DuSable serves a community infested by gangs, drugs, and violence. Eighty-five percent of the students live in the Robert Taylor Homes, a notori-

continued on page 16

continued from page 15

ously violent public housing high-rise. Although Mr. Brown emphasizes hands-on science using household items, a few pieces of more sophisticated equipment would have noticeable impact and inspire students to be more scientifically precise and academically serious. The following equipment would be especially helpful: microscopes, electrophoresis equipment, sterilizing oven, micropipette pumps, and incubators. Perhaps you or your department are upgrading and have used, but functional, equipment that the teachers at DuSable could use? If so please contact: Bennett Brown, 5211 S. Greenwood Ave. #2, Chicago, IL 60615, telephone 312-643-2192, e-mail <brown@jets.uchicago.edu>.

The Education Committee Needs YOUR Photos!

The ASPP Education Committee is preparing a careers brochure targeted to junior and senior high school students. The brochure includes photomontages on these topics . . .

- fiber production for making clothes (cotton, flax, polymers)
- medicinal production by plants (aspirin, taxol, digitalis, antibiotics, etc.)
- bioengineering of plants that make a useful product (latex, plastics, etc.)
- self-defense of plants (poisons, thorns, stinging hairs, hypersensitive response)
- stomates to illustrate how plants "breathe" and "see" . . .

. . . to be illustrated by photos of . . .

- people, especially students, working on the plants or equipment used to study plants
- the plants or cells involved
- commercial production of the useful product
- a model (biochemical, genetic, physiological, or ecological) of the response or topic

Send color photos, slides, or digitized Adobe Photoshop TIF files by January 1, 1995, to:

Dina Mandoli
Department of Botany, KB-15
University of Washington
Seattle, WA 98195
Telephone 206-543-4335
Fax 206-685-1728
E-Mail mandoli@u.washington.edu

If your photos are used, you will receive a complimentary ASPP T-shirt.

Program Committee Convenes To Discuss 1995 Annual Meeting

Call for Abstracts Reflects Some Changes

The ASPP program committee, at a meeting held November 5 in St. Louis, began planning for 1995's annual meeting in Charlotte, North Carolina. Some of the committee's plans are reflected on the call for abstracts that is bound into the center of this issue of the Newsletter (pages 17-20). They are summarized below:

- In a repeat of a successful effort begun at last summer's meeting in Portland, the committee will survey submitted abstracts to identify three "hot topics" that will be presented as mini-symposia at the annual meeting. Everyone who submits abstracts for the meeting should be alert to the possibility that his or her work could be selected for mini-symposium presentation.

- The format of the abstracts themselves will undergo a couple of slight modifications. In the list of authors, the name of the person who will be making the presentation (either orally or attending the poster) must be printed in all capital letters so that attendees can tell at a glance who the presenter is. Another change, one that is overdue, is that all abstracts reporting research that has been funded by outside sources must, where appropriate, acknowledge the source of funding. Such an acknowledgment is already common practice, of course, in journal publication. This change will also apply to the posters themselves.

- This year, it will not be an option to submit an "Abstract Only" for publication in the annual supplement to *Plant Physiology*. All abstracts submitted must be for either oral or poster presentations to be made at the meeting.

- The call for abstracts this year includes a postcard that is to be sent with each submitted abstract. After the program committee meets in March 1995 to set the program schedule, the postcards will be mailed with the abstract number, session number, and day of presentation indicated. In this way, all who have submitted abstracts will be notified early of their place on the schedule so that they can make appropriate plans for attending the meeting.

- Finally, the abstract supplement to *Plant Physiology*, which ordinarily is published in May, will instead be published in June 1995 and will include much more information about the meeting than has traditionally been the case. The supplement will be mailed to all subscribers to *Plant Physiology* and to all annual meeting registrants who register by July 1.

Included in this newsletter (page 27) is a form from the program committee that solicits ideas for mini-symposia for the annual meeting. These would be mini-symposia to be offered at the meeting in addition to the so-called hot topics that will be selected from the submitted abstracts. The form also solicits ideas for potential topics to be covered in the Society's symposium series called "Issues in Plant Biology."

Remember!

New procedures for posting job opportunities in the ASPP Job Placement Service take effect in the next issue. Any job notices sent from now on will be governed by these new procedures. See page 3 for details.

Gatherings

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

FUTURE ASPP ANNUAL MEETING SITES

1995: Charlotte, North Carolina
Saturday, July 29 through
Wednesday, August 2

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

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

1995

JANUARY

January 19-21
17th Annual Riverside Symposium in Plant Physiology
Carbon Partitioning and Source-Sink Interactions in Plants
University of California, Riverside

Organizers: Monica A. Madore, University of California, Riverside; and William J. Lucas, University of California, Davis. Sessions: Regulation of Carbon Partioning in Photosynthetic Tissues—R. Scheibe, U. I. Flugge, S. Huber, C. Foyer, W. Outlaw; Molecular Approaches to Carbon Partitioning: M. Stitt, T. J. Andrews, J. Preiss, W. Frommer; Transport Pathways—W. Lucas, S. Wolf, R. Leegood, K. Koch, H.-L. Wang; Other Translocated Carbohydrates—W. Loescher, D. M. Pharr, R. Turgeon, M. Madore; Sink metabolism—F. Keller, H. Lambers, P. Chourey, U. Sonnewald. Concluding remarks—D. T. Dennis. The symposium is limited to 175 persons. A poster session will be held on Thursday evening, January 19. A registration fee of $65 (non-students) and $25 (students) will cover registration and a luncheon on Saturday, January 21. For further information and an application form, contact Cindi McKernan, Department of Botany and Plant Sciences, University of California, Riverside, CA 92521, phone 909-787-3423 or fax 909-787-4437.

January 7-13
Keystone Symposium
Plant Cell Biology: Mechanisms, Molecular Machinery, Signals, and Pathways
Taos, New Mexico

Organizers of this meeting are Natasha Raikhel and Christopher Lamb. Keynote address: Phytochrome Phototransduction Pathways: Genetic and Biochemical Dissection, N.-H. Chua. Keynote lecture: Genetic and Biochemical Dissection of the Secretory Pathway, R. Schekman. Sessions and presenters: Cell Surface/Extracellular Matrix: R. Quatrano, J. Nasrallah, T.-H. Kao, C. Lamb; Cell Adhesion, Cytoskeleton, and the Recognition Process: J. Nasrallah, R. Quatrano, S. Long, K. Roberts; Plasmodesmata and Nuclear Pores: K. Roberts, N. Raikhel, S. Lazarowitz, J. Carrington; Cell Division: C. Lamb, P. Doerner, T. Bisseling, V. Sundaresan; Membrane Signaling: M. Chrispeels, J. Schroeder, S. Assmann, P. Hepler, M. Sussman; The Tonoplast and Plasma Membrane: J. Schroeder, W. Frommer, M. Chrispeels, H. Sze; The ER: N. Raikhel, A. Vitale, J. Denecke, G. Galili, C. Somerville; Plastids: J. Chory, A. Staehelin, K. Keegstra, K. Cline; Cytoplasmic Regulatory Mechanisms: J. Ecker, P. Green, M. Mehdy, G. Coruzzi; Signaling to the Nucleus: P. Green, J. Chory, J. Ecker, A. Theologis, R. Dixon. Workshops: Transport Vesicle: Inside and Outside: D. P. Verma; Heat Shock Proteins and Molecular Chaperones: F. Vierling. Application and abstract deadline is September 7, 1994. Attendance is limited to 300. A small amount of funding is available to some students and postdocs to help defray the cost of the meeting. The selection of students and postdocs for this support will be based on the quality and relevance of science presented in the abstracts. For more information contact Keystone Symposia, Drawer 1630, Silverthorne, CO 80498; telephone 303-262-1230, fax 303-262-1525.

January 15-19
Plant Genome III
San Diego, California

The International Plant Genome Conference will be sponsored by the USDA/ARS and National Agricultural Library, the John Innes Centre (UK), the Rockefeller Foundation, and the International Society for Plant Molecular Biology. Session topics are: chromosome structure, isolation and transformation of agriculturally important genes, instrumentation/technology, comparative genetic mapping, QTLs/metabolic pathways. Co-chairs are S. Heller, J. Miksche, M. Gale, S. McCouch. For registration materials, poster abstract application, and exhibit information, contact: Plant Genome III, c/o Scherago International, Inc., 11 Penn Plaza, New York, NY 10001; telephone 212-643-1750, fax 212-643-1758, e-mail scherago@biotechnet.com.

January 22-27
46th Congresso Nacional de Botanica Brazil
Ribeirão Preto, SP, Brasil

The annual meeting on botany, a major forum promoted by the Botany Society of Brazil for an exchange of information among plant scientists, will be held on the campus of the University of São Paulo in Ribeirão Preto. The program includes scientific expeditions, poster sessions, workshops, symposia, lectures, the 2nd Symposium on Gallery Forest, and the 4th Symposium on Bromeliaceae. For information write to: XLVI Congresso Nacional de Botanica, Dep. Biologia/FFCLRP/USP, Av. Bandeirantes, 3900, 14040-901-Ribeirão Preto, Brasil; fax 16-633-5015.

January 29-February 3
Gordon Research Conference
Temperature Stresses in Plants
Oxnard, California

Meeting organizers: Mike Thomashow, chair; Don Ort, vice-chair. Session topics and chairs/speakers will include: mechanisms of sensing temperature (R. Dhindsa/W. Gurley, T. Palva, B. Pickard); role of membranes in

temperature stress tolerance (J. Crowe/N. Murata, J. Browse, P. Steponkus); heat-stress proteins (E. Vierling/A. Gatenby, J. Jordano); links between temperature and drought stress (C. Vertucci/K. Shinozaki, T. Close, C. Lijenberg); breeding for temperature stress tolerance (J. Greaves/J. Palta, H. Nguyen); effects of temperature on photosynthesis (D. Ort/E. Robertson, I. Davison); life at extreme temperatures (G. Zeikus); and whole plant responses to temperature stress (J. Burke). Funds will be available to help defray meeting costs for a limited number of promising young scientists (senior graduate students, postdocs, and equivalent). To be considered for an award, which will be made on the basis of merit and need, send a copy of your curriculum vitae to: Mike Thomashow, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824. For information regarding conference program contact: Mike Thomashow, e-mail, 22676mft@msu.edu; fax 517-353-5174. For application forms and other meeting information contact: Dr. Carlyle B. Storm, Director, Gordon Research Conferences, University of Rhode Island, P.O. Box 984, West Kingston, RI 02892-0984; telephone 401-783-4011; fax 401-783-7644.

FEBRUARY

February 5-10
Gordon Research Conference
Chemical/Biological Synergies to Reduce Inputs for Pest Control
Oxnard, California
The meeting will focus on rationally designed mixtures and strategies using biological and chemical mechanisms to synergistically lower inputs in weed, disease, and insect pest management; and to discuss the For registration information see October issue of *Science* or contact either of the following co-chairs (preferably by e-mail): Jonathan Gressel, Plant Genetics, Weizmann Institute of Science, Rehovot, 76100 Israel, fax 972-8-469124, e-mail lpgress2@wiccmail.weizmann.ac.il; David A. Fischhoff, Monsanto Company, 700 Chesterfield Parkway, North St. Louis, MO 63198, USA; fax 314-537-6047, e-mail dafisc@ccmail.monsanto.com.

MARCH

March 5-9
XVIII Eucarpia Symposium:
Section Ornamentals
Ornamental Plant Improvement:
Classical and Molecular Approaches
Tel Aviv, Israel
This meeting is organized jointly with the Kennedy-Leigh Centre for Horticultural Research of The Hebrew University of Jerusalem. Topics will include: breeding of ornamental crops; genetic manipulation of ornamental crops; molecular markers for the identification and breeding of ornamentals; genetic resources for widening the assortment of ornamental crops; environmentally friendly ornamentals; molecular control of flower development; genetics of flower longevity; tissue culture for ornamental breeding. Abstract deadline: November 1, 1994. Registration deadline: December 30, 1994. For further information, contact: Dan Knassim Ltd., P. O. Box 57005, Tel Aviv, 61570 Israel; telephone 972-3-5626470, fax 972-3-5612303.

March 16-19
37th Annual Maize Genetics Meeting
Asilomar, California
This meeting provides a forum for discussing recent research advances in maize genetics. Topics will range from cytogenetics to molecular genetics and will include chromosome mechanics, cytoplasmic inheritance, mapping, transposable element behavior, gene identification and expression, development, tissue culture, and transformation. The scientific program will consist of posters, invited talks, workshops, and poster discussion. Invited speakers are: Ed Coe, "Genetics is . . ."; Michael Freeling, "Molecular genetic analysis of leaf development"; Jonathan Jones, "Functional analysis and deployment of Ac/Ds in heterologous species"; and Sarah Hake, "How meristems give rise to leaves." Information packets will be sent to previous participants. To add your name to the mailing list or to request further information, please contact: Karen Cone, Chair, Maize Genetics Steering Committee, Division of Biological Sciences, Tucker Hall, University of Missouri, Columbia, MO 65211; fax 314-882-0123, e-mail cone@biosci.mbp.missouri.edu.

March 18-20
ASPP Southern Section Annual Meeting
UT Conference Center
Knoxville, Tennessee
The meeting will include a symposium on Cellular Mechanisms for Surviving Protoplasmic Water Loss. For further information contact: Mary E. Musgrave, Department of Plant Pathology and Crop Physiology, 302 Life Sciences Bldg., Louisiana State University, Baton Rouge, LA 70803, telephone 504-388-1464.

March 22-23
Royal Society Discussion Meeting
Control of Development in Higher Plants
London, England
Organized by P. R. Bell, C. J. Leaver, and R. I. Pennell. This meeting will cover all aspects of plant development from the regulation of gene expression by environmental factors, signal transduction, cell development to the generation of plant form. Speakers will include, Chua, Chory, Knight, Ecker, Jurgens, Sussex, Pennell, Coupland, Coen, Hake, Goldberg, Langdale, Franssen, and Roberts. For further information contact: Mary Manning, The Royal Society, 6 Carlton House Terrace, London, SW1Y 5AG, UK; telephone 171 839 5561, fax 171 930 2170.

March 26-31
5th International
Botanical Microscopy Meeting
Plant Cell Biology
Oxford Brookes University
Oxford, England
The program of this meeting will include: microtubule and cytoskeletal dynamics, microscopy of living cells and ion imaging, plant cell organization, molecular mechanisms of plant development, plant microbe interactions. Keynote speakers: B. Gunning, H. Shibaoka, J. Hush, S. Gilroy, K. Oparka, K. Roberts, M. Parthasarathy, Z. Cande, J. Doonan, R. Howard, A. Hardham. Attendance will be limited to 150. For further information, contact Karen Hale, Royal Microscopical Society, 37/38 St. Clements, Oxford, OX4 1AJ; telephone 44-865-248768, fax 44-865-791237.

March 26-April 1
Keystone Symposia, Concurrent Meetings
• Frontiers of Plant Morphogenesis
• Signal Transduction in Plants
Hilton Head Island, South Carolina
Organizers of Frontiers of Plant Morphogenesis are Richard J. Cyr and Barry A. Palevitz. Organizers of Signal Transduction in Plants are Daniel F. Klessig and Winslow Briggs. Topics and speakers for Frontiers of Plant Morphogenesis: Current perspectives in plant morphogenesis—I. Sussex, W. Briggs; Cytoskeleton and morphogenesis—J. Traas, D. Menzel, P. Benfey; Mitosis and division planes—K. Dawes, W. Sheridan, P. Hepler, L. Smith; Cell cycle (joint)—M. Van Montagu, T. Bisseling; Extracellular matrix and morphogenesis—K. Roberts, A. Staehlin, D. Cosgrove, R. Williamson; Genetic analysis of morphogenesis—J. Schiefelbein, R. S. Poethig, J. Medford, F. Sack; Cytoplasmic/cell wall communications in morphogenesis—R. Wayne, R. Quatrano, M. Hahn, N. Carpita; Cell-cell communication (joint)—J. Nasrallah, N. Brewin, W. Lucas; Signal transduction and morphogenesis—A. Harmon, M. Wada, S. Long. Topics and speakers for Signal Transduction in Plants: Hormonal signaling—R. Quatrano, J. Ecker, E. Meyerowitz, A. Jones, M. Estelle, R. Hedrich; Signaling in plant-pathogen interactions—D. Klessig, J. Ryals, J. Ebel, D. Scheel, F. Ausubel, P. De Wit, L. Walling, C. Lamb; Signaling by light—W. Briggs, A. Cashmore, J. Chory, P. Quail, X. Deng, E. Schafer, N. Chua; Stress signaling—C. Ryan, D. Bowles, E. Farmer, N. Raikhel, J. Huber. Contact Keystone Symposia, Drawer 1630, Silverthorne, CO 80498; telephone 303-262-1230, fax 3093-262-1525.

APRIL

April 3-6
International Symposium on Weed and Crop Resistance to Herbicides
University of Córdoba, Spain
This symposium will be jointly sponsored by the European Weed Research Society and the Spanish Weed Science Society. General topics: herbicide target sites and resistance mechanisms associated with them; resistance mechanisms associated with herbicide metabolization and detoxification; other resistance mechanisms; biotechnological approaches to develop herbicide resistance in crops—problems and possibilities; integrated mechanical, chemical, and biological methods for weed control—managing or avoiding resistance. Deadline for abstracts: November 30, 1994. For further information, contact Dr. J. Jorrín, Departamento de Bioquímica y Biología Molecular, Universidad de Córdoba, 14080 Córdoba, Spain; telephone 57-218439, fax 57-218563, e-mail bf1jonoj@lucano.uco.es

April 7-8
ASPP Midwestern Section Annual Meeting
Kellogg Center
Michigan State University, East Lansing
For further information, contact: Ray Zielinski, Secretary/Treasurer MWASPP, Department of Plant Biology, University of Illinois, 1201 W. Gregory Dr., Urbana, IL 61801; telephone 217-333-6785, fax 217-244-1336, e-mail rez@uiuc.edu.

April 7-12
Plant Mitochondria: From Gene to Function
Durham, North Carolina
This international meeting will cover topics of plant mitochondrial molecular biology, biochemistry, genetics, and physiology. The meeting will focus on the unique aspects of plant mitochondria and their importance to plant functioning. Topics will include: mitochondrial genomes: structure, evolution and plasticity; mitochondrial genes: editing and regulation of expression; mitochondrial biogenesis; mitochondrial electron transfer: structure and function; photorespiration: genetics and biochemistry; respiration in plant carbon balance, and environmental regulation of plant mitochondrial function. Particular attention will be paid to those areas that are presently best positioned to interface molecular and biochemical-physiological approaches to the study of plant mitochondrial structure and function. Organizers are Lee McIntosh and Jim Siedow. For further information, contact Jim Siedow, DCMB-Botany, Box 91000, Duke University, Durham, NC 27708-1000, USA; telephone 919-613-8180, fax 919-613-8177, e-mail jsiedow@acpub.duke.edu.

April 19-22
14th Annual Missouri Symposium
The Role of Plants in Bioremediation
University of Missouri, Columbia
Sessions: Heavy metal hyper-accumulators, tolerance/exclusion mechanisms, phytodecontamination—metals, plant-assisted degradation of organic compounds, and bioengineering plants for bioremediation. Contact: Doug Randall, University of Missouri, 117 Schweitzer Hall Columbia, MO 65211; fax 314-882-5635, e-mail bchemdr@mizzou1.missouri.edu.

April 28-29
ASPP Northeast Section Annual Meeting
University of Rhode Island, Kingston
The meeting will be jointly hosted by Richard Hull and Alison Roberts. The organizers are planning a symposium on the general theme of plant microbe interactions. Contact Richard Hull (telephone 401-792-5995, fax 401-792-4017) or Alison Roberts (telephone 401-792-4098, fax 401-792-5974, e-mail awroberts@uiracc.uri.edu).

MAY

May 8-13
First International Symposium of Sucrose Metabolism
Mar del Plata, Argentina
This meeting will commemorate the 40th anniversary of the discovery of the two sucrose metabolizing enzymes and honor the memory of their discoverers, Drs. Luis Leloir and Carlos Cardini. The aim of the meeting is to present a comprehensive and integrated view of sucrose metabolism under the following main topics: sucrose biosynthesis and its regulation; sucrose cleavage and its regulation; molecular biology of sucrose metabolizing enzymes; sucrose conversion to starch; sucrose conversion to fructans and raffinose-based polymers; sucrose transport (long distance and intracellular) and the role of sucrose in plant stress. The symposium will consist of six to eight sessions of four to five speakers each with discussion session and evening poster presentations. Those interested in receiving additional information in the future please contact: Dr. Horacio Pontis or Dr. Graciela Salerno, Fundacion para Investigaciones Biologicas Aplicadas, Casilla de Correos 1348, 7600 Mar del Plata, Argentina, telephone 54-23-74-8257, fax 54-23-74-3357; or Dr. Ed Echeverria, Citrus Research and Education Center, 700 Experiment Station Road, Lake Alfred, FL 33850, USA, telephone 813-956-1151, fax 813-956-4631.

May 20-24
1995 Congress on In Vitro Biology:
Interplay of Cells with Their Environment
Denver, Colorado
This meeting will include a plant session. Topics and conveners: Interplay of Plant Cells With Their Environment: The Role of Stress-Induced Proteins (Convener, N. Trolinder); Interplay of Plant Cells With Their Environment: Modification of Interplay In Transgenic Plants (Conveners, R. Newton, J. Finer); Strategies for Engineering Disease Resistance in Plants (Convener, I. Vasil); Biotransformation of Natural and Novel Compounds (joint with Vertebrate) (Convener, M. Horn); In Vitro Forest Tree Strategies (Conveners, D. Ellis, N. Arnold). Workshops: Transformation Challenges for Recalicitrant Crops (Convener, M. Hinchee); Micropropagation: Interplay with the Microbial Environment (Conveners, B. Reed, P. Read); Transgenic Vegetables in the Developmental Pipeline (Convener, P. Zankowski). Abstract deadline: January 13, 1995. Contact Tiffany McMillan, telephone 410-992-0946, fax 410-992-0949.

May 24-26
NABC 7
Genes for the Future:
Discovery, Ownership, Access
Columbia, Missouri
Gene mapping, currently a central issue in agricultural biotechnology, will be the theme of the seventh annual meeting of the National Agricultural Biotechnology Council (NABC). Plenary sessions with invited speakers and workshops will address the discovery of genes, the ownership of genes, and access to genes of species important to agriculture. Topics for discussion include the status of gene mapping; economic, legal, and institutional issues surrounding the ownership of genes; and public and private rights of access to genes. These topics will be considered in the context of research policy as well as the national and international agenda for agricultural biotechnology. For information, contact NABC, 159 Biotechnology Building, Cornell University, Ithaca, NY 14853-2703.

May 28-June 3
10th International Congress on
Nitrogen Fixation
St. Petersburg, Russia
Organizer of this meeting is Igor Tikhonovich, and it will be held under the auspices of the Research Institute for Agricultural Microbiology. For more information, contact: Prof. I. Tikhonovich, Congress Organizer, Research Institute for Agricultural Microbiology, P. B. 364, General Post Office, 190000, St. Petersburg, russia; fax 812-470-43-62, e-mail chief@riam.spb.su.

JUNE

June 1-4
1995 Symposium on
Biochemistry and Molecular Biology of
Plant Fatty Acids and Glycerolipids
South Lake Tahoe, California
This meeting is sponsored by a DOE/NSF/USDA Triagency Grant and will focus on the biochemistry and molecular biology of fatty acid and lipid biosynthesis in plants, as well as advances resulting from applications of biotechnology. There will be three plenary speakers (P.G. Roughan, V. Knauf, J. Browse) and numerous short talks and posters. Funds will be available to help defray the cost of the meeting for a limited number of young scientists, including new investigators, postdocs, and senior graduate students. For applications to attend or for further information, contact meeting organizers, John Ohlrogge,Michigan State University, Botany & Plant Pathology, East Lansing, MI 48824 (e-mail 22346mgr@msu.edu, fax 517.353.1926) or Jan Jaworski, Chemistry Department, Miami University, Oxford, OH 45056 (e-mail janj@miamiu.acs.muohio.edu, fax 513.529.4221).

June 11-16
Gordon Research Conference
Plant Cell Genetics and Development:
Apical Meristems and Primordia
Wolfeboro, New Hampshire
Chair: Rich Jorgensen; vice-chair: Jo Messing. Topics (discussion leaders/participants): Embryo Patterning; Shoot and Leaf Primorida (I. Sussex/G. Jurgens, S. Hake, K.Barton S. Clark); Meristem Diversity and Evolution (I. Sussex/R. Litz, J. Jernstedt, M. Christianson, L. Graham); Root Apices (L. Feldman/P. Barlow, B. Scheres, N. Kerk, M. Hawes); Methods in Cell Genetics (J. Messing/E. Lam, R. Martienssen, C. Dean); Induction of Flowering (E. Irish/S. Poethig, M. Koornneef, G. Coupland, R. Amasino); Heritable Epigenetic States (R. Martienssen/J. Messing, V. Chandler, R. Jorgensen); Evolution of Reproductive Morphology (M. Christianson/M. Frohlich, C. Gasser, J. Doebley, T. N. Taylor); Reproductive Morphology (C. Gasser/D. Weigel, E. Irish, G. Angenent). Application form in February 3, 1995, issue of *Science*, or from Gordon Research Conferences, University of Rhode Island, PO Box 984, West Kingston, RI 02892-0984. Attendance limited to 135. Posters strongly encouraged. Send poster abstracts with application and e-mail to both messing@mbcl.rutgers.edu *and* rajorgensen@ucdavis.edu. Some funding available for developing scientists; apply to chair: rajorgensen@ucdavis.edu.

June 18-23
Molecular Genetics and Ecology of
Pesticide Resistance
Yellowstone Conference Center
Big Sky, Montana
The objective of this conference, sponsored by the Division of Agrochemicals of the American Chemical Society, is to examine the phenomenon of increased resistance to natural synthetic pesticides used in agriculture. It will also consider the public health implications of resistance to medicinal antibiotics. International experts on bactericides, fungicides, herbicides, and insecticides will share their experience in the scientific investigation and practical management of resistance. The following five topics of interdisciplinary concern will be addressed: (1) molecular genetics and evolution of resistance mechanisms in target proteins and detoxicative enzymes, (2) interspecies transformation and application of resistance, including genetically engineered bacteria and crop plants, (3) population genetics and ecology of resistance, including global dispersion and movement of genes across species in microorganisms, plants, and insects, (4) antiresistance strategies including models and practical management strategies, (5) pesticide registration and regulation: impact of resistance. Deadline for submittal of abstract (poster presentation) is December 9, 1994. Standard ACS abstract forms are acceptable. For further information contact: American Chemical Society, Meetings Department, 1155 16th Street N.W., Washington DC 20036, telephone 202-872-6286, fax 202-872-6128.

June 26-30
International Workshop
Peroxidase Biotechnology and Application
Puschino (Moscow Region), Russia
The scientific program of this workshop will include these topics: novel peroxidase sources; gene cloning, expression, and protein engineering; peroxidase substrate specificity, stability, mechanism of action and inactivation; peroxidase in analysis, biosensors, environmental control; peroxidase in industry, production of drugs, phenolic resins, lignin biodegradation. To receive the second circular, a program, and registration forms, contact Dr. I. G. Gazaryan, Division of Chemical Enzymology, Department of Chemistry, Moscow State University, 119899 GSP Moscow, Russia; fax 7-95-939-27-42.

JULY

July 2-7
7th International Symposium on
Preharvest Sprouting in Cereals
Abashiri, Hokkaido, Japan
Specific topics will include: Physiology and molecular biology of grain development and germination; influence of environmental, physical and agronomic factors on sprouting; genetics and plant breeding; effects of sprouting damage on cereal end products. To receive a first announcement contact: Secretariat, 7th International Symposium on Preharvest Sprouting in Cereals, Kitami Agricultural Experiment Station, Kunneppu, Hokkaido 099-14, Japan; telephone 0157-47-21 46, fax 0157-47-2774 or M. K. Walker-Simmons, USDA-ARS, 209 Johnson Hall, Washington State University, Pullman, WA 99164-6420; telephone 509-335-8696, fax 509-335-8674, e-mail simmons@wsuvm1.edu.

July 4-7
9th International Rapeseed Congress
Cambridge, England
Since the last Congress in Saskatoon in 1991, interest in rapeseed has been aroused by awareness of the superior nutritional advantages of rape oil. There is also growing recognition of outlets for industrial purposes, for which the perceived benign effect on the environment is an added attraction. It is intended that the congress should cover these and other aspects of rapeseed production and utilization. Cambridge is in a major rapeseed growing area and has a distinguished background in agricultural research. The first announcement and call for papers is currently being distributed. Copies are available from the secretary: Denis Kimber, 44 Church Street, Haslingfield, Cambridge, CB3 7JE, England.

July 9-15
European Symposium on
Photomorphogenesis in Plants
Sitges, Barcelona, Spain,
Specific topics will include: Blue-UV light photoreception, phytochrome properties and phytochrome genes, photoregulation of gene expression, signal transduction in photomorphogenesis, photocontrol of plant growth, photomorphogenesis in lower plants, photomorphogenesis in natural conditions. Second announcement containing the final program and all details of registration and accommodation will be mailed in November 1994. Contact address: Dr. Carmen Bergareche, Departament de Biologia Vegetal, Facultat de Biologia, Diagonal 645, 08028 Barcelona, Spain; fax 34-3- 4112842, telephone 34-3-4021464.

July 14-19, 1995
15th International Conference on
Plant Growth Substances
Minneapolis, Minnesota
The scientific program will cover all aspects of plant growth regulation. The proposed program will consists of plenary sessions, concurrent symposia with invited speakers, posters, and workshops. Plenary sessions will cover subjects on: (1) signal transduction, (2) integration of growth processes, (3) hormonally regulated gene expression, and

(4) generation of fundamental knowledge and applications using transgenic plants. Twenty symposia are planned, each consisting of three to five speakers, on topics including hormone biosynthesis, hormone metabolism, tropisms, flowering, hormone perception/sensitivity, and interactions of hormones with other signalling systems. Arrangements have been made to have all posters on display throughout the meetings. Workshops will be designed to accommodate last-minute breakthroughs. The organizing committee for the IPGSA meeting is chaired by Gary Gardner (University of Minnesota) and Bernard O. Phinney, president of IPGSA (University of California, Los Angeles), and includes M. Brenner, R. Coolbaugh, M. H. Goldsmith, W. Hackett, E. Jaworski, R. L. Jones, H. Kende, T. Lomax, N. Olszewski, I. Rubenstein, M. K. Walker-Simmons, and J. Zeevaart. All scientific sessions will be held at the headquarters hotel, the Hyatt Regency, in Minneapolis. This meeting will be held in conjunction with the Annual Meeting of the Plant Growth Regulator Society of America, and joint sessions are being planned that emphasize applied aspects of plant growth regulation. The first circular will be mailed this summer (1994). The second circular, containing registration and abstract preparation materials, will be sent in late 1994. Additional information can be obtained by contacting Gary Gardner, Department of Horticultural Science, University of Minnesota, 305 Alderman Hall, St. Paul, MN 55108, USA, fax 612-624-3606, e-mail ggardner@maroon.tc.umn.edu.

July 17-21
Fourth International Symposium on the Molecular Biology of Potato
Wageningen, The Netherlands
For information please contact the Congress Bureau: IAC-Section OCC, Mrs. M. van Amstel, PO Box 88, 6700 AB Wageningen, The Netherlands; telephone 31 8370 90111, fax: + 31 8370 18552.

July 23-28
4th International Symposium on Inorganic Nitrogen Assimilation
Darmstadt, Germany
The scientific program covers transport, reduction, and assimilation of inorganic combined nitrogen comprising uptake and allocation, interference with N_2 fixation, enzyme biochemistry and molecular biology, energetic aspects, carbon/nitrogen relationships and ecophysiology. The meeting will be in the scope of the Federation of European Societies of Plant Physiologists. Detailed information with registration forms will be delivered on request, registration deadline is April 1, 1995. Contact: Wolfram Ullrich, Institut für Botanik, Technische Hochschule, Schnittspahnstr. 3-5, D-64 287 Darmstadt, Germany; fax 49-151-16-4808.

July 30-August 2
American Society of Plant Physiologists Annual Meeting
Charlotte, North Carolina
Deadline for abstracts is February 28, 1995. Contact: Susan Chambers, ASPP Headquarters, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 310-251-0560, ext. 11, fax 301-279-2996, e-mail chambers@access.digex.net.

AUGUST

August 6-11
10th International Workshop on Plant Membrane Biology
Regensburg, Germany
Meeting is intended to cover the following topics: pumps, carriers, channels, long distance transport processes, and transduction of chemical and electrical signals. Second announcement containing the final program and all details on registration and accommodation will be mailed in October 1994. To obtain the second announcement, contact Widmar Tanner or Norbert Sauer, Lehrstuhl für Zellbiologie und Pflanzenphysiologie, Universität Regensburg, Universitätsstrasse 31, 93053 Regensburg, Germany; fax 49-941-943-3352.

August 7-11
4th International Congress on Amino Acids
Vienna, Austria
This multidisciplinary congress will cover all aspects of amino acids in different organisms. The congress will offer invited symposium papers as well as contributed talks and posters. The meeting will be limited to 600 participants. The deadline for the submission of titles is February 28, 1995. For further information contact: Bijay K. Singh, American Cyanamid Company, P.O. Box 400, Princeton, NJ 08543-0400 USA, or B. Lubec, Department of Pediatrics, University of Vienna, Wahringer Gurtel 18, A-1090, Vienna, Austria.

August 13-17
Phytochemical Society of North America Annual Meeting
Sault Ste. Marie, Ontario, Canada
The meeting will feature a symposium entitled Phytochemical Redundancy in Ecological Interactions. The theme of the symposium will stress the diversity, overlap, and variety of plant chemical defenses against biological stresses including insects, fungi, and large herbivores. Speakers for the symposium are being solicited from persons active in the area. Interested potential speakers or persons with suggestions for speakers should contact either program co-chairperson for additional information: Dr James A. Saunders, Plant Sciences Institute, USDA, Bldg. 9, Rm 5, Beltsville, MD 20705, telephone 301 504-7477, fax 301 504-6478; Dr. Pedro Barbosa, Department of Entomology, University of Maryland, College Park, MD 20742, telephone 301 405-3946 office, fax 301 314-9290.

August 20-25
10th International Photosynthesis Congress
Montpellier, France
Topics: molecular organization of the photosynthetic apparatus; photophysical and photochemical processes; mechanisms of energy conservation; regulation of carbon metabolism and related enzymes; assimilation of nitrogen, sulfur, and other elements; structure of membranes, organelles, cells, and tissues; genes and regulation of their expression; development of the photosynthetic apparatus; photosynthesis and evolution; stress and adaptation; photosynthesis in global environment; photosynthesis in agricultural production and forestry; design and action of herbicides; chemical models and artificial photosynthesis; biotechnology; photosynthesis and renewable energy resources. A limited number of fellowships may be granted to some students and scientists encountering financial difficulties. For further information, contact: Dr. Paul Mathis (Photosynthesis Congress), DBCM-SBE, CEA Saclay, Bâtiment 532, 91191 Gif-sur-Yvette CEDEX, France; fax 33-1-69-08-87017.

SEPTEMBER

September 3-7
4th International Workshop on Pathogenesis-Related Proteins in Plants: Biology and Biotechnological Potential
Kloster Irsee, Germany
Organized by E. Kombrink and I. E. Somssich. The scientific program will cover all aspects of PR proteins in plants and will consist of plenary lectures of invited speakers, short oral contributions of participants, and posters. Session topics: (1) structure of PR proteins, (2) function in plant defense, (3) function in metabolism, growth, and development, (4) temporal and spatial expression patterns, (5) regulation of gene expression, (6) generation and transduction of signals, (7) programmed cell death, (8) genetically determined disease resistance, (9) engineered resistance: biotechnological potential of PR proteins. Speakers will include B. Baker, T. Boller, R. A. Bressan, W. Broekaert, B. Fritig, F. Garcia-Olmedo, R. Dietrich, J. Draper, D. F. Klessig, W. Knogge, E. Kombrink, H. J. M. Linthorst, F. Meins, Jr, L. S. Melchers, I. Raskin, J. Ryals, I. E. Somssich. Attendance is limited to 120 participants. For further information contact: Dr. Erich Kombrink, Abteilung Biochemie, Max-Planck Institut für Züchtungsforschung, Carl-von Linné-Weg 10, D-50829 Köln, Germany, fax +49-221-5062-313.

September 13-15
14th Long Ashton
International Symposium:
Plant Roots—from Cells to Systems
Long Ashton Research Station
Bristol, England
Topics and speakers: Development and morphology—B. Scheres, T. Rost, P. Barlow, A. Tomos; Structure and function—L. Kochian, E. Stuedle, W. Lucas, K. Raschke; Environmental interactions—R. Sharp, P. Stamp, A. Bengough, M. Jackson, N. Robinson; Molecular interactions with other organisms—P. Sijmons, C. Shaw, V. Gianinazzi-Pearson, T. Bisseling, D. Chriqui. Keynote lecturer: M. McCully. Contact H. M Anderson, Department of Agricultural Sciences, University of Bristol, Institute of Arable Crops Research, Long Ashton Research Station, Bristol, BS18 9AF, United Kingdom; telephone 275-392181, fax 275-394007.

September 25-27
Harnessing Apomixis:
A New Frontier in Plant Science
Texas A&M Univeristy, College Station
This international symposium is sponsored by Texas A&M University and USDA. Invited speakers and contributed posters will cover various genetic, molecular, physiological, cytological, and evolutionary aspects of asexual seed production and its application to crop improvement. Related topics in sexual plant reproduction will also be covered. An international steering committee is developing the program. Some financial support for international attendees will be available. For further information and circulars, please contact Dr. David M. Steller. Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843-2474; telephone 409-845-2745, fax 409-862-4733, e-mail monosom@rigel.tamu.edu.

OCTOBER

October 1-4
International Symposium:
Engineering Plants for Commercial Products/Applications
University of Kentucky, Lexington
Co-organizers: Glenn B. Collins and Robert J. Shepherd. To be added to the conference mailing list, send your name and address to: International Symposium on Engineering Plants, c/o Conferences and Institutes, 218 Peterson Service Building, Lexington, KY 40506-0005 USA; e-mail monica.stoch@ukwang.uky.edu, telephone 606-257-3929, fax 606-323-1053.

October 8-12
Third International Symposium:
Cytochrome P450 Biodiversity
Woods Hole, Massachusetts
The symposium will be held at the Swope Conference Center of the Woods Hole Marine Biological Laboratory. The scientific program will focus on cytochromes P450 from microorganisms, plants, and insects, and will include all aspects of research on P450s from these organisms. Contact: Dr. John C. Loper, Department of Molecular Genetics, University of Cincinnati School of Medicine, Cincinnati, OH 45267-0524, fax 513-558-8474.

October 8-12
International Symposium:
Dynamics of Physiological Processes in Woody Roots
Ithaca, New York
The symposium will provide a forum for scientists working on various aspects of belowground physiological processes to present their latest results. The principal objectives of the symposium will be to: (1) examine the effects of environmental stress on belowground physiological processes in woody plants, and (2) determine whether belowground responses may be used as early indicators of environmentally induced changes in organismal structure and function. Proposed timetable: Deadline for receipt of abstracts February 1, 1995; acceptance of papers for oral/poster presentation April 1, 1995; registration by July 1, 1995; manuscripts due October 8, 1995. Organizing committee: Mary Topa, Boyce Thompson Institute for Plant Research, Ithaca, NY; Paul Rygiewicz, USEPA Environmental Research Laboratory, Corvallis, OR; Jonathan Cumming, University of Vermont, Burlington, VT; Merrill Kaufmann, USDA Forest Service, Ft. Collins, CO. For more information about the symposium, contact Dr. Mary A. Topa, Boyce Thompson Institute, Tower Road, Ithaca, NY 14853-1801, USA; fax 607-254-1242, e-mail mat8@cornell.edu.

Larry Vanderhoef, chair of the board of trustees, at the annual business meeting.

One last look at the 1994 Annual Meeting dinner dance in Portland. A group enjoys the beautiful weather and the good food and the company.

Dr. and Mrs. Winslow Briggs at the opening night mixer of the 1994 ASPP Annual Meeting in Portland, Oregon. Dr. Briggs was awarded the Society's Stephen Hales Prize at the meeting.

ASPP Education Foundation Proposal

Editor's note: Printed below is the text of the proposal to create an American Society of Plant Physiologists Education Foundation. ASPP's executive committee approved the proposal at its meeting in Portland, Oregon, in 1994. On the annual ballot that will be mailed to all members in the spring of 1995, the membership of ASPP will be asked to approve the Foundation by adding it to the Society's constitution and bylaws. This statement will be published in the Newsletter until the time of the election.

Mission Statement

The American Society of Plant Physiologists Education Foundation (ASPPEF) promotes and supports education in the plant sciences to enhance the role of the plant sciences in a global society.

Goals

1. To promote the teaching of plant sciences at all levels.
2. To advance public understanding and appreciation of the value of plant sciences to the welfare of society.
3. To support the development of new initiatives in emerging areas of plant science education.
4. To provide a mechanism for individuals and organizations to support education and research in the plant sciences.

Composition of the ASPPEF Board of Directors

The Board of Directors will be a standing committee of the Society and shall consist of one member designated as the Chair appointed to a three-year term by the President with the approval of the Executive Committee, twelve members recommended by the Chair and the President for approval by the Executive Committee, and the following *ex officio* members: the president, the president-elect, the immediate past president, the chair of the board of trustees, the treasurer, and the executive director. Each appointed member of the Board of Directors will serve a three-year term (NOTE: Initially, the terms of the twelve will be staggered such that four will be appointed for four-year terms, four for three-year terms, and four for two-year terms.)

Duties of the ASPPEF Board of Directors

The Board of Directors of the ASPPEF shall oversee the management of all activities of the Foundation. The ASPPEF will report to the Executive Committee through the Chair of its Board of Directors. The Board of Directors will be responsible for developing the ASPPEF budget, which will be presented to the Board of Trustees to be included as part of the Society's annual budgetary process. Final approval of the ASPPEF budget will rest with the Executive Committee.

Approval

The structure outlined above will be subject to the approval of the ASPP membership as required by the constitution and bylaws of the Society. Until this approval is granted, the ASPPEF Board of Directors will exist as an *ad hoc* committee of the Executive Committee of the Society.

Review

Continuation of the Foundation will be subject to review once every five years by the Executive Committee to examine the ASPPEF operation and success in achieving its goals. The review committee will be an *ad hoc* committee chaired by the Past President and consisting of five other individuals appointed by the President. The Review Committee will make a recommendation to the Executive Committee which will then make a decision regarding continued authorization of the ASPPEF.

Budgetary Issues

1. The ASPPEF budget will be developed by the Board of Directors as a self-contained, independent fund within the overall society budget.
2. To provide an initial base of funding for the ASPPEF, one million dollars will be moved from the ASPP General Endowment into a separate (restricted) fund, to be designated the ASPP Education Foundation Endowment. Use of the funds in the ASPPEF Endowment will be subject to the same annual limit of 5.0% of the market value currently associated with the use of the General Endowment.

Duties of the Chair of the Board of Directors

The duties of the Chair of the Board of Directors include directing the activities of the Foundation, working with the President to identify members of the Board of Directors, recruiting volunteers to accomplish Foundation goals, assisting in cultivating corporations, foundations and other donors compatible with ASPPEF goals, and reporting to and serving as a member of the ASPP Executive Committee.