

# Society of Toxicology NEWSLETTER

JANUARY/FEBRUARY 1989

### SOT Members Participate in Scientific Panel Discussion

**Dr. Bernard Goldstein, Dr. Ronald Hart** and **Dr. Roger McClellan** contributed to a recent panel discussion, moderated by the National Public Radio's Daniel Zwerdling, at the Annual Meeting of the American Industrial Health Council.

Dr. McClellan called for measures to facilitate the movement of scientists from government to industry positions and vice versa. Dr. Hart carried this point a step further in calling for efforts to bring scientists from all sectors together in the face of increasing global competition in the scientific arena

Dr. Goldstein stressed the need for U.S. industry to put more money into scientific research. He criticized industry's lack of investment in research programs which has contributed to the public's lack of understanding of complex, vital issues such as risk assessment. This lack of understanding, Goldstein continued, blunts our nation's competitive edge in world markets.

Panelists concluded the discussion with comments on the role of the media in covering chemical disasters. Mr. Zwerdling, of the NPR, agreed with panelists that the media distorts issues with a narrow, anecdotal focus on chemical issues and disasters. He called for greater communication between the scientific community and the media.

#### Guidelines for Use of Animals in Research, Testing and Education Available.

The New York Academy of Sciences has made available a set of guidelines for the use of animals in research testing and education. This document was prepared by an ad hoc committee with the assistance of an advisory panel. SOT member **Dr. Robert Drew** represented the Society on the advisory panel.

The document includes a brief review of the characteristics of anesthetic and analgesic agents, and is available for \$3.00 from: The New York Academy of Sciences, 2 East 63rd Street, New York, NY 10021.

#### Harvey W. Wiley Award

The \$2,500 Harvey W. Wiley Award is sponsored by the Association of Official Analytical Chemists (AOAC) and given annually to an outstanding scientist or scientific team for contributions to analytical methodology in areas of: foods, vitamins, food additives, pesticides, drugs, cosmetics, plants, feeds, fertilizers, hazardous substances, air, water, and any other products, substances, or phenomena affecting the public health and safety, the economic protection of consumers, or environmental quality.

The Award was established in 1956 in honor of Dr. Harvey W. Wiley, "Father of the Pure Food and Drug Act."

Nominations will be accepted year-round. Those received before December 1st of any year will be eligible for the following four years' awards. Eligibility may be extended an additional four years by written request of the nominator. Please send award nominations and letters to AOAC, 1111 N. 19th Street, Suite 210, Arlington, VA 22209. For more information contact Margaret Ridgell at (703) 522-3032.

### Dermatotoxicology Specialty Section Considered

**Dr. Howard Maibach** has reviewed the mechanics of establishing a specialty section of the SOT and will determine the degree of interest in forming a dermatotoxicology specialty section based on responses from the membership. Members interested in forming such a section should write: Howard Maibach, MD, University of California Medical School, Department of Dermatology, Box 0989, San Francisco, CA 94143-0989. If there is enough interest, Dr. Maibach will prepare the proposal for the membership's consideration.

#### 1989 Dues are Due!

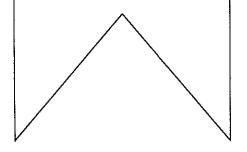
A reminder: your 1989 dues must be received at headquarters by March 31, 1989, in order for you to continue to receive your journals. Please note that you can pay via MasterCard or Visa.

1133 15th Street, N.W., Suite 1000, Washington, D.C. 20005 Telephone: (202) 293-5935 • Telex: 292046 IMGUR • Fax: (202) 775-9631



Society of Toxicology 1133 15th Street, NW Suite 1000 Washington, DC 20005 (202) 293-5935 FAX (202) 775-9631

Deadline for next issues: May 8, 1989 July 8, 1989 September 8, 1989 November 8, 1989



#### President's Message

Dear Fellow Members:

Our year is moving by quickly. Three quarters have passed, and our officers, Councilors, Committee members, and staff have been busy during the whole of this time. No one has postponed their work until the "last minute." In fact, in this spot I have been keeping you appraised of all the activities that are under way.

With the Annual Meeting behind us, we can reflect on the body of work undertaken and evaluate our performance. We began this term by polishing the report of the Tox-90's Commission and seeing to its publication in October 1988 in *Toxicology and Applied Pharmacology*. This report was instrumental in establishing an agenda for this term, and several to come.

Activities of standing committees and ad hoc committees alike have been directed toward meeting many of the recommendations of the Tox-90's Commission. In education, several new initiatives have been established. These include the formation of the "Tox-90's Education Issues Task Force," led by A. Jay Gandolfi, that is updating the "Careers in Toxicology" brochure and conceived the plan to promote a toxicology research internship program. This ad hoc group is enthusiastically committed to the development of a workable and successful student recruitment program. In concert with the recruiting plans of the "Task Force," the Education Committee has been successful in establishing additional graduate student fellowships, which are an important adjunct to the educational objectives of the Society. I am pleased to welcome CIBA-GEIGY as the newest contributor. Thus, in the area of education we can claim good progress.

To better understand the "state of the market" for toxicologists, the Technical Committee, led by **Robert A. Scala**, is seeking to fund and implement a survey of manpower availability and demand. The survey, when complete, should provide reliable information on the projected need for toxicologists in academia, government, and industry as well as provide a measure of how the requirements for the members of this group are changing. At the same time the survey will measure the output of educational programs now, and those projected for the future, and assess how the training of toxicologists will change, if it does, in the future. This project, while now fully underway, still needs to be seen through to completion. However, I am convinced that good progress has been made and that soon the survey will be completed.

The Ad Hoc Endowment Funds Committee, chaired by Seymour Friess, has submitted its recommendations for the establishment of a fund to provide for certain SOT education activities in perpetuity. Council is carefully considering their recommendations, and I expect the Committee's effort to be successful.

The Committee on Public Communications (CPC) has been extremely active this term and in addition to their Special Poster/Demonstration Session highlighting educational materials at the Atlanta Annual Meeting they have been pursuing a number of other projects. These include the development of an SOT Toxicology Resource Information Service, and the establishment of a mechanism to develop articles on toxicology that are targeted toward physicians and published in journals like JAMA. The Committee is led by Art Craigmill.

A special subcommittee of the CPC is being chaired by **Jon Seymour** and is concerned with public school curricula and relates to opportunities for introducing some of the key issues of toxicology into programs of study in the elementary, junior, and senior high school grades. All of these activities are closely in line with the recommendations of the Tox-90's Commission and will, in my view, be successful.

As previously reported, **Shayne Gad's** Animals in Research Committee has been extremely productive. They have completed the pamphlet "A Look at Animal Use in the Science of Toxicology," which will soon be ready for distribution by SOT and they have started work on a second pamphlet tentatively entitled "Benefits Derived from Animal Research in Toxicology." This work has been long awaited by many members. I am sure the completion of the first pamphlet will be helpful to all of us. Among other things, the Animals in Research Committee has also been active in planning symposia with one on the program for 1989 and another being planned for consideration for the 1990 Annual Meeting.

The Regulatory Affairs and Legislative Assistance Committee, under the direction of Marshall Steinberg and assisted by Carol Schiller has been working to devise approaches and mechanisms to develop materials that could be used effectively in informing legislative bodies on issues of interest to the Society. The sense is that there is an important role for the various Specialty Sections in such an endeavor. Among the topics being considered for "position papers" are the following: "Animal Welfare and Research in Toxicology; Criteria for Determining a Carcinogen (or Neurotoxin, or Teratogen, etc.); What is Risk Assessment?; and Testing Products of Biotechnology." I hope that all members of the Society will lend their support and individual efforts to this proposal to make it work. It is in the best interest of all of us to make certain that legislators and regulators are in possession of current and correct information on all matters of interest to our discipline.

As you know, the remaining committees of the Society have discharged their duties and responsibilities in a timely and capable manner. All and all we have had a productive and successful year so far. I offer my warmest thank you to each and every Committee member and the officers, Councilors, and executive office staff for a job well done.

Finally, I welcome and congratulate all the members who joined the Society this year. We look forward to your enthusiastic support and participation.

With best wishes,

James E. Gibson, Ph.D.

#### Chapter News

#### Mid-Atlantic Society Of Toxicology Announces Spring Meeting, Ambassador Award Luncheon, and Oncogene Symposium.

The Mid-Atlantic Chapter of the Society of Toxicology will hold its Spring Meeting and Symposium on May 17, 1989 at the Hercules Country Club in Wilmington, Delaware. A poster-session will be held in the morning followed by the Ambassador of Toxicology Award Luncheon. The afternoon symposium will be devoted to the topic of oncogenes and will be followed by a reception.

For further details contact: Joseph C. Tigner, Ph.D., Boehringer-Ingelheim Pharmaceuticals, Inc., 90 East Ridge/P.O. Box 368, Ridge, CT 06877; (203) 798-5339, or Timothy P. Coogan, Ph.D., NYU Medical Center, Institute of Environmental Medicine, Long Meadow Road, Tuxedo, NY 10987; (914) 351-2793.

#### Member News

Ted Farber, Mike Farrow, Gary Flamm, and John Todhunter have formed a new consulting firm, Science Regulatory Services International, along with N. Bhushan Mandava and Donna Todhunter. SRS International will provide a broad range of services in the health and environmental safety sciences as well as regulatory affairs to the international chemical, agrichemical, pharmeceutical, food chemistry, medical device and diagnostic, and biotechnology communities. The firm is located in Washington, DC.

Bernard D. Goldstein, M.D., has been elected to the Board of Directors of Roy F. Weston, Inc. Dr. Goldstein chairs the Department of Environmental and Community Medicine at the University of Medicine and Dentistry of New Jersey (UMDNJ). He also serves as director of the Environmental and Occupational Health Sciences Institute (EOHSI) and director of the Graduate Program in Public Health, both joint programs between UMDNJ and Rutgers University.

**Dr. John A. Dellinger** has accepted an appointment as Senior Research Scientist, Department of Bioengineering, Electronic Systems Division at Southwest Research Institute in San Antonio, Texas. Dr. Dellinger will assist with the Institute's behavioral toxicology program.

After 14 years with contract research (Batelle Columbus) and chemical manufacturing (PPG Industries) organizations, **Dr. Philip Leber** has established Chem-tox Consulting in Akron, OH. The firm offers toxicology expertise in support of regulatory, legal and product safety issues.

**Sidney J. Stohs, Ph.D.** has accepted a position at Creighton University as Assistant Dean for Research in the School of Pharmacy and Allied Health Professions. In addition to administrative duties, he will be involved in research and teaching.

#### **Publications of Interest**

Advances in Air Sampling, \$49.95, the American Conference of Governmental Industrial Hygienists, Lewis Publishers, Inc., 121 South Main St., P.O. Drawer 519, Chelsea, MI 48118, phone orders: 1-800-525-7894.

The 1989 ASTM Directory of Testing Laboratories, \$50.00, 1916 Race Street, Philadelphia, PA 19103; (215) 299-5400.

ASTM Standards on Precision and Bias for Various Applications, \$32, 1916 Race Street, Philadelphia, PA 19103-1187; (215) 299-5585.

The Biological Alkylation of Heavy Elements (Special Publication No. 66) \$89.00, F. Glocking and P.J. Craig, The Royal Society of Chemistry, Distribution Center, Blackhorse Road, Letchworth, Herts SG6 1HN, U.K.

Carcinogenicity: The Design, Analysis, and Interpretation of Long-Term Animal Studies, H.C. Grice, J.L. Ciminera, eds., \$55.00, Springer-Verlag, 175 Fifth Avenue, New York, NY 10010.

Computerized Data Systems for Nonclinical Safety Assessment, Current Concepts and Quality Assurance, September 1988, \$45.00, Drug Information Association, P.O. Box 3190, Maple Glen, PA 19002.

Dictionary of Toxicology, \$82.50, E. Hodgson, Houndsmills, Basingstoke, Hampshire R621 2XS, U.K.

Effective Writing Strategies for Engineers and Scientists, D.C. Woolston, P. Robinson and Gisela Kutzbach, \$24.95, Lewis Publishers, Inc., 121 South Main Street, P.O. Drawer 519, Chelsea, MI 48118; 1-800-525-7894.

Experimental Toxicology, D. Anderson and D.M. Conning, eds., \$138.00, Royal Society of Chemistry, Burlington House, Piccadilly, London, W1V OBN; 01-734-9864.

Health and Environment Digest (newsletter). For free complimentary copy, write or call: Health and Environment Digest, 2500 Shadywood Road, Box 90, Navarre, MN 55392; (612) 471-9292.

Interdisciplinary Principles and Guidelines for the Use of Animals in Research, Testing, and Education, Ad Hoc Committee on Animal Research, The New York Academy of Sciences, New York, NY 10021.

Lipid Peroxidation in Biological Systems, \$85.00, Dr. Alex Sevanian, ed., American Oil Chemists Society, P.O. Box 3489, Champaign, IL 61821.

New Developments in Biotechnology—U.S. Investment in Biotechnology, \$13.00, Office of Technology Assessment—Congress of the United States, U.S. Government Printing Office, Dept. SSMC, Washington, DC 20402.

Petroleum Contaminated Soils—Remediation Techniques, Environmental Fare and Risk Assessment, Vol. I, P.T. Kostecki and E.J. Calabrese, eds., \$55.00, Lewis Publishers, Inc., 121 South Main Street, P.O. Drawer 519, Chelsea, MI 48118; 1-800-525-7894.

Recent Advances in Receptor Chemistry, \$123.75, Carlo Melchiorre and Mario Giannella, eds., Elsevier Science Publishers, P.O. Box 1663, Grand Central Station, New York, NY 10163.

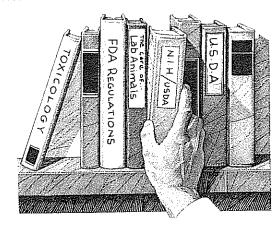
Risk Assessment Guidelines and Information Directory, \$56.00, Government Institutes, Inc., 966 Hungerford Drive, #24, Rockville, MD 20850; (301) 251-9250.

They Threaten Your Health: A Critique of the Antivivisection Animal Rights (AV-AR) Movement, \$13.95, Nutrition Information Center, 255 N. Granada, No. 2058, Tucson, AZ 85701.

Toxicology and Environmental Health Series (pending), Lewis Publishers, Inc., 121 South Main Street, P.O. Drawer 519, Chelsea, MI 48118.

Toxicology of the Lung, \$99.00, D.E. Gardner, J.D. Crapo, and E.J. Massaro, eds., Raven Press, 1185 Avenue of the Americas, New York, NY 10036.

Use of Laboratory Animals in Biomedical and Behavioral Research, National Research Council, \$11.95, National Academy Press, 2101 Constitution Ave., NW, Washington, DC 20418.



USP DI Volume III: Approved Drug Products and Legal Requirements, \$59.00. Contact: Keith W. Johnson, Director of Research and Development, USP Drug Information Division.

Workplace and Chemical Safety (catalog available), Van Nostrand Reinhold, P.O. Box 668, Florence, KY 41022-9979.

Year Book of Toxicology (first edition 1989), \$45.00, CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, Florida 33431.

Order the following 2 publications from Oryx Press, 2214 North Central at Encanto, Phoenix, AZ 85004-1483; 1-800-457-ORYX.

Science and Technology Annual Reference Review 1989, H.R. Malinowsky, ed., \$45.00.

Core List of Books and Journals in Science and Technology, R.H. Powell and J.R. Powell, Jr., \$35.00.

Order the following 3 publications from S. Karger Publishers, Inc., 79 Fifth Avenue, Suite 1702, New York, NY 10003:

Statistical Techniques in Bioassay, Z. Bovindarajulu, \$29.50.

A Guide to General Toxicology, J.K. Marquis, ed., \$45.50.

Models in Dermatology 4, H.I. Maibach and N.J. Lowe, eds., \$125.00.

alternative methods wherever possible. In this bill "animal" refers to any vertebrate. "Animal toxicity" is any animal acute toxicity test, and "nonanimal toxicity test" is any nonanimal acute toxicity test. This bill died in the Energy and Commerce Committee.

H.R. 1708: Information Dissemination and Research Accountability Act, Rep. Torricelli, NY: Establishes the National Center for Research Accountability, consisting of 20 presidential appointees who review all research proposals involving animals and approved by Federal agencies. If alternative means exist to the use of animals Federal funds would be withdrawn from these projects. Bill would delay the funding process and impose enormous costs associated with far-reaching bureaucratic attempts to monitor research. This bill died in the Energy and Commerce Committee.

S. 2814; Consumer Products Safe Testing Act; Sen. Reid: This bill requires Federal department or agency heads to dismiss LD50 results when determining product safety, labeling, or transportation requirements for purposes of Federal regulations, review any item requiring use of animal toxicity tests, and declare regulations specifying the use of nonanimal toxicity tests whenever possible. This Act, with the potential to outlaw all animal toxicity testing, died in the Senate Commerce Committee.

#### Animal Legislation Early Focus of 101st Congress

On the first day of the 101st Congressional session, four pieces of animal legislation were introduced. Rep. Toby Roth (D-WI) introduced HR 425, the Animal Welfare Protection Act of 1989, which empowers the USDA to "suspend immediately the operation of animal dealers, carriers, exhibitors or intermediate handlers knowingly dealing in stolen animals or placing the health of animals covered under the Act in danger."

Representative Andrew Jacobs (D-IN) introduced three concurrent resolutions concerning animals. HCR 4 condemns rapid decompressions as a means of animal euthanasia. HCR 5 advocates the option of meatless meals in federally funded school lunch programs. HCR 6 expresses "the braize rabbit eye irritancy test should develop valid alternative ophthalmic testing procedures that do not require animal test subjects."

#### EPA Revises Acute Toxicity Testing Policy

In a move intended to "reduce the use of experimental animals while providing adequate information about chemical safety," the EPA has revised its evaluation policy for acute toxicity of chemical exposures under the Federal Insecticide, Fungicide and Rodenticide Act and the Toxic Substances Control Act.

In the new policy, EPA suggests the use of abbreviated tests when appropriate, and recommends four methodologies: I) the approximate lethal dose method, 2) the moving averages method, 3) the up-and-down method and 4) the cumulant method. The revised policy suggests parallel testing on male and female animals is not necessary and recommends and female animals is not necessary and recommends

EPA stresses the need for comprehensive information gathering and "urges industry to begin submitting data obtained with alternate methods which use fewer animals on a routine basis."

Complete copies of  $\operatorname{EPA}$ 's revised policy can be obtained from the  $\operatorname{SOT}$  office.

#### Watching Washington State Legislation Update

The following is an update on state legislation through the close of the 1988 session. Many of the bills have died due to adjournment of the 1988 session.

IL (HB 3175); prohibits use of animals for certain types of testing (Draize LD50). Bill died.

MA (S 41): Prohibits use of lethal dose and eye irritancy test on living, nonhuman vertebrates for testing consumer products, excluding pharmaceuticals. Bill died.

(H1772): Prohibits state inspection agents from carrying dangerous weapons in animal facility or research institutions.

(H2743): Requires that no law in MA be construed to prevent the conduct of scientific investigation, experimentation, or biomedical research using animals which will benefit the health of humans or other animals. Bill died.

(H5907); Makes breaking into an animal research institute punishable by imprisonment and a fine. Enacted 10/25/88.

MN (SF791): Allows officers from the MN Humane Society to enter a research institute during business hours to view the facility and to photograph or otherwise document conditions. Bill died.

NJ (A1398): Prohibits LD50 test. Still pending, will carry over into 1989 session.

(A2836): Prohibits the use of animals in testing consumer products. Still pending, will carry over into 1989 session.

NY (A9700): Prohibits research facilities from obtaining pound animals from out of state. (Current law prohibits this

pound animals from out of state. (Current law prohibits this for instate pounds.) Held in the Agriculture Committee.

(S8219): Only purposebred animals will be used in research. Held in the agriculture committee.

OH (SB364): Deletes current law allowing impounded dogs to be made available for research or education. Bill died.

 $\ensuremath{\mathsf{PA}}$  (SB890): Prohibits use of all pound animals. After passing the Senate, bill died.

 $\rm VA$  (HB489 & HB933); Both are pound bills still in study committee and will carry over to the 1989 session.

#### Federal Legislation Update

The following is an update of Federal legislative efforts through the 100th session of Congress. All the bills mentioned died due to lack of time at the close of the session.

H.R. 778; Pet Protection Act; Rep. Mrazek, NY: prohibits researchers using animals from animal shelters from receiving NIH funding. Bill died at close of 100th Congress.

S. 2353; Pet Theft Act of 1988; Sen. Ford, KY: requires recipient of random source dogs or cats to keep and maintain certifications for a period of at least one year. Only dealers may be fined for violations. Toxicologists concerns not have facilities to hold all animals they receive, therefore they may be euthanized before they can be offered to dealers. Bill passed the Senate, there was no vote in the House, therefore the bill died.

H.R. 1635; Consumer Products Safe Testing Bill; Rep. Boxer, CA: This bill mandates federal agencies to re-examine their animal toxicity testing programs and employ

## Coming Events Carcinogen Risk Assessment (4th a by the Society for Risk Analysi

Gordon Research Conference: Mechanisms of Toxicity, July 24-28, 1989, Kimball Union Academy, Meriden, New Hampshire. For information contact: John A. Thomas, Ph.D., The University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, Texas 78284-7722; (512) 567-2045.

103rd Association of Official Analytical Chemists Annual Meeting, September 25-28, 1989, at the Clarion Hotel in St. Louis, MO. For information, write to: Suite 400, 2200 Wilson Boulevard, Arlington, VA 22201-3301.

Fourth International Meeting on Biological Reactive Intermediates, hosted by the University of Arizona Center for Toxicology, January 14-17, 1990 at the Double Hotel, Tucson, AZ. For further information, contact: Dr. I. Glenn Sipes, College of Pharmacy, University of Arizona, Tucson, AZ 85721, (602) 626-7123.

#### Liaison Societies

The Society of Toxicology has a variety of liaison societies. From time to time, a brief description of a few of these societies will be published in the SOT Newsletter. This is one in a series of descriptions.

and details of the Society. ies. Also, a quarterly Newsletter offers current information cluding morphologic, diagnostic, and experimental studpathologic documentation of toxicologic phenomena, ining with the multidisciplinary elements that constitute publication of the Society is Toxicologic Pathology, dealtional meetings are held during the year. The official Regional Discussion Groups, numerous topical educasors an annual international symposium. Through its Members. The Society of Toxicologic Pathologists sponare also invited to join in the Society as Sustaining ual members, from 30 states and 14 countries. Institutions Membership in the Society currently stands at 460 individregistries of pathologic entities in laboratory animals. cal and environmental pathology. 4) The establishment of recognition of pathologists in the fields of pharmacologironmental agents. 3) The encouragement of training and logical changes produced by drugs, chemicals, and enviand requirements applied to the interpretation of pathothrough appropriate means. 2) The evaluation of criteria communication and exchange of information in this field logical, chemical, and environmental agents, and the pathology as it pertains to changes elicited by pharmaco-1971. The aims of the Society are: 1) The advancement of as a non-profit scientific and educational organization in The Society of Toxicologic Pathologists was incorporated

For additional information and membership application, please contact:

Dr. J. Frantz, Secretary-Treasurer Rohm and Haas Co. Toxicology Department 727 Norristown Road Spring House, PA 19477 (215) 641-7488

Carcinogen Risk Assessment (4th annual course), sponsored by the Society for Risk Analysis, April 3-5, 1989, One Washington Circle Hotel, Washington, DC. For further information please call: Dr. Curtis C. Travis, 615-576-2107 or FTS 626-2107 or Mary Oran 615-574-8438 or FTS 626-2107 or Mary Oran 615-574-8438 or FTS 626-2107 or Mary Oran 615-574-8438 or

In Vitro Toxicology: New Directions, sponsored by the Johns Hopkins Center for Alternatives to Animal Testing, April 4-5, 1989, the Turner Building, Baltimore, Maryland. For further information contact: Program Coordinator, Office of Continuing Education, Turner 22, 720 Rutland Avenue, Baltimore, MD 21205; (301) 955-2959.

Mid-America Toxicology Course, April 23-28,1989, Kansas City, Missouri. For more information, contact: Course Director, Curtis D. Klaassen, Ph.D., Professor of Pharmacology and Toxicology, University of Kansas Medical Center, Kansas City, KS 66103, (913) 588-7714.

In Vivo Percutaneous Penetration Workshop, sponsored by FDA, May 1-3, 1989, Washington, DC. For information write to: University of California, San Francisco, School of Medicine, Dermatology Department, Box 0989, San Francisco, CA 94143-0989.

8th International Symposium, A Modern Approach to Toxicologic Pathology of the Mervous System, May 21-25, 1989, The Hyatt Regency, Cincinnati, OH. Contact Mancy Streett, Planning Unlimited, PO Box 220, New London, PA 19360, (215) 869-0702. Deadline for abstracts March 15, 1989.

The Second Meeting of the International Neurotoxicology Association (INA), May 22-26, 1989, will be held in Sitges, Barcelona, Spain. For more information on the meeting, please contact: Dr. E. Rodriguez Farre, Secretariat II INA Meeting, Dept. of Pharmacology and Toxicology CSIC, Jorge Girona Salgado, 18-26, BARCELONA, E-08034, Spain.

Association for Behavior Analysis, 15th Annual Convention, May 24-28, 1989, Hyatt-Regency Hotel, Milwaukee, WI. Contact ABA, Western Michigan University, 258 Wood Hall, Kalamazoo, MI 49008-5052, (616) 387-4494.

Annual Conference on Trace Substances in Environmental Health, May 29-June 1, 1989, the Westin Hotel, Cincinnati, Ohio. Information is available from: Fred Block, Ph.D., USDOI Office of Surface Mining, 1951 Constitution Ave., NW, Room 115 S, Washington, DC 20240; (202) 343-4553.

Tissue Culture Association, Inc. Annual Meeting, June 11-14, 1989, Hyatt Orlando, Orlando, Florida. For additional information, write to the Association at: 19110 Montgomery Village Avenue, Suite 300, Gaithersburg, MD 20879.

Fifth International Conference on Environmental Mutagens, July 10-15, 1989, Cleveland, OH. Contact Fifth ICEM 1989, Department of Environmental Health Sciences, School of Medicine, Case Western Reserve University, 2119 Abington Road, Cleveland, OH 44106, (216) 368-6213.

Fifth International Congress of Toxicology, July 16-21, 1989, Brighton, United Kingdom. Contact IUTOX '89, Congress House, 65 West Drive, Sutton, Surrey SM27NB, UK.

Second International Conference on Practical In Vitro Toxicology, July 23-27, 1989, Nottingham, United Kingdom. Information is available from the PIVT Secretariat, Congress House, 65, West Drive, Sutton, Surrey, SM2 7NB, UK.

Third International Symposium on Poisonous Plants, July 23-29, 1989, The Conference and Institute Division of Utah State University, Logan, UT. Contact Dr. Lynn F. James, USDA-ARS Poisonous Plant Research Laboratory, 1150 East 1400 North, Logan, UT 84321, (801) 752-2941.