



Association Of
Environmental
Engineering
Professors

NEWSLETTER

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D. W. HENDRICKS

PRESIDENT'S CORNER

Research Conference

The AEEP is sponsoring its third research conference. The theme of the conference is *Fundamental Research Directions in Environmental Engineering*. The conference will be held in Washington, D.C., November 13-15, 1988; additional information regarding location and registration for the conference is provided elsewhere in the *Newsletter*, as well as under separate mailings. The conference will address water, air and land environments and will therefore be multidisciplinary. The conference will be concerned with pollutant emissions, flow through the environment, and subsequent effects, as well as the link between these environmental science issues and policy questions.

The conference follows its predecessor by a period of six years. A considerable amount of environmental legislation has been enacted in this interval, much of which has focused on toxic and hazardous substances. These issues necessitate comprehensive approaches to managing and controlling environmental problems. While the problem scale may be local, regional, national or global, the need for optimal utilization of available resources is common to all scales. In this context, it is time for an assessment of fundamental research needs in environmental engineering as broadly circumscribed. The critical environmental problems of the future will entail intermedia processes in conjunction with complex societal and technical issues. The conference will address these matters and thus will help answer questions on the directions for the environmental engineer/scientist for the 21st century.

The conference will address approaches to achieve timely implementation of environmental research in order to help guide environmental policy and assist technology development. Four discussion sessions are planned. Each of the first three sessions will be

focused on processes with a specific scientific base — physical, chemical, or biological. Within each process area, individual researchers will assess research directions within a single medium — land, air or water. The fourth session will focus on intermedia processes and the identification of comprehensive approaches to environmental problems. One segment of the program will be devoted to risk assessment.

The format for the program will consist of short formal presentations, followed by prepared discussions. It is intended that the time allocated for general discussion from the audience will be as long as that given to prepared presentations. In this manner the program will emphasize the exchange of viewpoints and engage the participation of AEEP members. Reprints of conference papers will be provided to registrants prior to the conference. This research conference is an important activity of the AEEP; please make plans now to attend the conference in November.

Annual Luncheon

As is our tradition, the AEEP will sponsor an annual membership luncheon Monday, October 3, 1988 in Dallas, Texas during the Water Pollution Control Federation meeting (see Announcement and Reservation form at end of *Newsletter*). This luncheon will celebrate the 25th Anniversary of the AEEP. Preparations have been made to make this a special event, including perspectives on the history of the organization and its future directions. The luncheon will be held at the Hyatt Regency Hotel, across the street from the Dallas Convention Center beginning at 11:45 A.M. This will be a special event for which we can all join in celebration of 25 years service to our profession.

Richard G. Luthy
President

AEEP NEWS AND ANNOUNCEMENTS

Conference on Fundamental Research Directions in Environmental Engineering

November 13-15, 1988, Key Bridge Marriott Hotel, Arlington, Virginia

The Association of Environmental Engineering Professors is sponsoring a conference on Fundamental Research Directions in Environmental Engineering (see Registration form at end of *Newsletter*). The focus of the conference is on discussion of comprehensive approaches for managing and controlling environmental problems using a multidisciplinary and multimedia perspective. Four sessions are planned. Each of the first three sessions will address processes with a specific scientific base — physical, chemical or biological. The fourth session will address intermedia processes. In addition to specific research themes, the conference will consider how environmental science research may help guide national environmental policy while assisting the development of cost-effective control strategies. The manner in which research results may be effectively transmitted from research "producers" to research "users" will also be discussed.

The AEEP has sponsored research conferences in 1977 and 1982 on the general topics of water and wastewater systems. This conference will be wider in scope than the two previous meetings; it will be directed towards air, land and water environments. The conference is being supported in part by the National Science Foundation with supplemental funding from the Environmental Protection Agency.

Registrants will receive a packet of position papers and prepared discussions prior to the meeting. It is intended that sufficient time will be allowed following each presentation for general discussion involving conference attendees. The conference is open to all interested parties, and will commence on Sunday evening November 13 with a presentation and a reception. The formal program will begin on Monday, November 14 at 8:30 AM and conclude at 1:00 PM on Tuesday, November 15.

Please make plans now to attend the conference. A list of speakers and a schedule of events will be provided in a subsequent mailing. The AEEP conference will coincide with a portion of the 9th Annual Meeting of the Society of Environmental Toxicology and Chemistry to be held at the nearby Hyatt Regency Hotel in Arlington, VA. AEEP members may find it convenient to attend both the research conference and the SETAC meeting.

AEEP Workshop at the WPCF Conference

Charles Eckert and Carl Lira will present an AEEP Workshop on Sunday, October 2nd, at the WPCF Conference in Dallas. The workshop is entitled "Reactions and Extractions Using Supercritical Fluids", and will be held in the Dallas Convention Center, Room N-215, from 1 to 5 PM.

Professor Eckert is from the University of Illinois. He is a member of the National Academy of Engineering, has directed over 37 Ph.D. theses, and has published extensively in the area of supercritical fluids (SCF). A great deal of his work has dealt with environmental applications of this technology.

SCF has been used for the direct extraction of DDT, trichlorophenol, and other toxic organic materials from soils, as a regeneration technique for granular activated carbon or polymeric adsorbents, for the direct destruction of organic waste streams by supercritical water oxidation, and for the precombustion desulfurization of high-sulfur coals. Professors Eckert and Lira will present an Overview of SCF, Fundamentals of Phase Equilibria that are necessary in order to understand the process, General Applications, Environmental Applications, and Cost Estimates for processes such as wet oxidation, soil detoxification, and GAC regeneration.

You may register in advance (Brian Dempsey, 212 Sackett Building, Penn State University, University Park, PA 16802) or at the door. Registration is \$25 for AEEP members and \$10 for students. Notes will be provided.

AEEP Distinguished Lecturer for 1989

Professor Peter Grau of Czechoslovakia has been selected as the AEEP's Distinguished Lecturer for 1989. Information concerning the selection and details of his lecture topics was not available for this issue of the *Newsletter*; however, Makram T. Suidan (University of Illinois, 217/333-9017) will soon have the information and prepare an announcement for AEEP members. Professor Grau's address is as follows:

Prof. Peter Grau
VSCHT
Prague Institute of Chemical Technology
Suchbatarova Five
CS 166 28
Prague, Czechoslovakia

AWWA Research Foundation

The following article was prepared by James K. Edzwald, AEEP's representative on the Public Council on Water Supply Research (PCWSR), a public advisory committee to AWWARF. The purpose of the article is twofold: to provide information to AEEP members about research funding opportunities with AWWARF and to let you know about the PCWSR.

AWWARF serves as a private centralized research organization for the water supply industry of North America. It was formed in 1967, but had little money for research until about five years ago. At that time Congress provided seed funds through EPA to help the Foundation develop a sponsored research funding program. The Foundation no longer receives funds from EPA; it is now funded solely through a Subscription Program with water utilities. In 1987 the income from the Subscription Program was \$2.8 million. The goal for 1990 is \$5 million.

Quoted below is the mission of the foundation from their *Five Year Research Plan: 1988-1992*.

The mission of the AWWA Research Foundation is to sponsor practical, applied research in behalf of the drinking water industry of North America. The scope of the research program embraces all aspects of water supply operation, from development and maintenance of water resources to treatment technologies and water quality issues, from storage and distribution system operations to health effects studies and utility planning and management activities. AWWARF serves as the centralized industry institution for planning, managing, and funding cooperative research and development in drinking water, including the subsequent transfer of technology and results for practical application by the water utility community.

The Foundation has both a Solicited Research Program and an Unsolicited Research Program. The Solicited Research Program operates through the issuance of RFPs (Requests for Proposals). The RFPs come out once per year in late winter or early spring. The deadline for proposals is usually May 1 and awards are announced in June at the time of the Annual AWWA Conference. In 1988 the funds allocated for the Solicited Research Program amounted to \$3.1 million. The Foundation's funding of unsolicited research prior to 1987 was, by policy, 7½% of the total research budget. In 1987, upon recommendation of the PCWSR, the Foundation increased the allocation to a minimum of 15% of the total research budget. This means that in 1988 a minimum of \$555,000 will be awarded through the Unsolicited Research Program. Of course as the Foundation's total budget grows so will the Unsolicited Research Program. Proposals for the Unsolicited Research Program are due April 1 of each year. Awards are announced in June. Information can be obtained from the AWWARF, 6666 West Quincy Avenue, Denver, CO 80235.

Finally, a little bit of information about the PCWSR. The Council is a 10 member advisory committee to AWWARF representing diverse groups from the professional, environmental, and consumer segments of the water supply industry. Dr. Edzwald has been serving as AEEP's representative since December 1986 and will continue until December 1989. The major issues the Council dealt with over the last 18 months has been the Unsolicited Research Program and the Foundation's *Five Year Research Plan*. As mentioned earlier, the Foundation upon recommendation of the Council increased its percentage funding of unsolicited research. The *Five Year Research Plan* was reviewed by the Council during 1987, approved by AWWARF's Board of Trustees in January 1988, and is now available from AWWARF.

AEEP members are encouraged to write to Dr. Edzwald regarding their views and ideas pertaining to AWWARF.

AEEP Register of Graduate Programs

Efforts are underway to compile and publish the next edition of AEEP's *Register of Environmental Engineering Graduate Programs*. The last edition, published in 1984, was considered successful based upon sales to libraries and other groups around the U.S. and Canada. Co-editors Bill Knocke (Virginia Polytechnic Institute and State University) and Gary Amy (University of Arizona) have developed the following publication schedule for the 1989 edition:

July 15, 1988 Mailing of instruction packets to candidate programs regarding submittal preparation.

October 15, 1988 Deadline for submittal of completed program description.

January 1, 1989 Release of 1989 edition of AEEP *Register*.

If your environmental engineering program did not participate in the 1984 edition of the *Register*, but wishes to be involved in the 1989 edition, please write for submittal instructions to Dr. W. R. Knocke, Department of Civil Engineering, 200 Patton Hall, VPI & SU, Blacksburg, Virginia 24061.

Member Address Changes

David W. Ostendorf is on sabbatical leave from the University of Massachusetts until June 1, 1989. He may be contacted at the following address:

Dr. David W. Ostendorf
Robert S. Kerr Environmental Research Lab
U.S. Environmental Protection Agency
P.O. Box 1198
Ada, OK 74820

Deadline for the December, 1988, Newsletter

Please mail articles for the December issue of the AEEP *Newsletter* to the editor, G. D. Boardman, by November 1, 1988.

GENERAL NEWS

Environment Canada's Wastewater Technology Centre

The Wastewater Technology Centre (WTC) is operated by Environment Canada, the department of environment of the federal government of Canada. The main responsibility of the Centre is to develop, demonstrate, and optimize processes for treating and disposing wastewaters and sludges. In addition, WTC staff provide advice on technical issues to industries, municipalities, and other government agencies.

WTC's research and development mandate is carried out by approximately 50 full-time staff and a number of contractors. Facilities at the WTC building in Burlington, Ontario, enable research to be conducted at bench-scale or pilot-scale using municipal sewage piped from the City of Burlington or industrial wastes and sludges trucked to the Centre and stored in outside tanks. Research is also carried out at full-scale municipal and industrial sites located across Canada.

The following project descriptions provide a brief overview of the scope of work sponsored and conducted by the Wastewater Technology Centre:

1. **Dynamic Modeling and Expert Systems in Wastewater Engineering** — With financial support from the WTC and other sponsors, a major research project is underway at McMaster University to develop a comprehensive library of dynamic models for major biological and physical-chemical treatment processes. Software is being designed to facilitate interactive simulations using these models, enabling users to intervene in a simulation in progress, for instance by changing the recycle in an activated sludge plant, and see the response in the simulated process performance. By combining an expert system — programs which can perform at or near the level of a human expert — with simulations from dynamic models, a system is being created for the control and operation of wastewater treatment plants.
2. **Stripping of Volatile Organic Contaminants in Municipal Wastewater Treatment plants** — On behalf of the Ministry of Environment of the province of Ontario, the WTC is conducting a comprehensive study to measure and predict the release of volatile organic compounds to

the atmosphere. At full-scale, off-gas samples have been collected at selected plants in conjunction with a wastewater and sludge sampling program at 40 Ontario municipal treatment plants. Using a pilot plant, theoretical models for predicting the fate of volatile organic compounds will be developed and tested. The objective of these studies is to develop an understanding of the fate of hazardous compounds entering municipal treatment plants so that appropriate regulations can be established by the province.

3. **Control of Polymer Addition for Sludge Dewatering** — The WTC has developed, over the past ten years, a measurement and control system for polymer addition to belt filter presses. Prior to dewatering, the viscosity of a sample is measured and compared to the viscosity of an optimally conditioned sample to determine correct polymer dosage. If the dosage is not optimum, the controller changes the rate of the polymer feed pump. Following evaluation of the sludge conditioning controller at a full-scale treatment plant, the control system was licensed to Zenon Environmental Inc. of Burlington, Ontario.

Other areas in which significant research is being conducted include: the application of high rate anaerobic technology for the pretreatment of high strength organic wastes, computer control of municipal activated sludge plants, land application of sludge, the characterization and treatment of water produced from enhanced oil recovery, and the assessment of solid waste leaching and disposal.

The Wastewater Technology Centre supports Canadian universities in training environmental engineers and conducting research. The WTC currently funds a number of major research projects at Canadian universities. WTC professional staff are encouraged to serve as part-time lecturers in environmental engineering. A number of research or demonstration projects are conducted using a combined team of university and WTC personnel. Frequently during such programs conducted at WTC facilities, senior WTC personnel supervise graduate students in their thesis work. Finally, co-op and summer employment programs at the Centre offer undergraduates the opportunity to spend a work term in a research environment and gain meaningful engineering experience.

The WTC produces an annual report and a quarterly newsletter. For copies of these or for more information concerning WTC's programs or services, please write Dr. Bruce Jank, Director, Wastewater Technology Centre, P.O. Box 5050, Burlington, Ontario, L7R 4A6, Canada.

1989 AWWA Academic Achievement Award Competition

The American Water Works Association recently announced the opening of the 1989 Academic Achievement Award Competition. Awards are made annually to graduate students whose theses or dissertations are judged to have significant value to the water supply industry. The Association established this award to give recognition to those students who have made outstanding contributions to the field of public water supply through their work at a university. Professors who serve as major advisors to winners are also recognized during the award program and receive a commemorative plaque. The competition is open to students majoring in any subject provided the work is directly related to the drinking water supply industry.

The deadline for entries for the next competition (for theses completed between 9/1/87 and 9/1/88) is October 1, 1988. Entry forms and additional information can be obtained by calling AWWA headquarters at 303-794-7711 (ext. 2307).

Availability of Textbook Concerning "Environmental Technology in Developing Countries"

Environmental Technology in Developing Countries (ETDC textbook) is written by Harvey F. Ludwig, J. W. Evans, W. Y. Brockelman, and B. N. Lohani. The authors have experience in both industrial country and developing country environmental technology (IC/ET and DC/ET), and is written from the DC point of view; i.e., how to solve environmental problems using appropriate technology at budget levels much less than available in the ICs for the same problems.

The ETDC textbook comprises two volumes totalling over 1,000 pages. Volume I deals with overall ET issues including environmental impact assessment, regional economic-cum-environmental development planning, industrial waste permit systems, and environmental quality monitoring and standards. Volume II deals with individual environmental sector problems such as water supply, pollution control, forestry and wildlife, watershed management, tourism resources, precious ecology, etc.

The ETDC textbook is available from the Seatec International Publishing Company, P.O. Box 8-101, Bangkok, Thailand, at a cost of US\$ 100 plus mailing costs (maximum of \$40).

New Books Available from ASCE

Mathematical Models in Coastal Engineering

Basic methodology for the formulation and numerical solution of mathematical models in coastal engineering is provided in this book.

Edited by Christopher G. Koutitas
Published by Pentech press, Ltd., 1988
165 pages, \$42.00

Specification for Ground Treatment

The papers in this two-volume set provide guidance for the non-specialist based on practical experience of ground treatment contracts.

Published by Thomas Telford, Ltd., 1987
64 pages, \$18.00

Controlling Waterborne Giardiasis

A State-of-the-Art Review prepared under the auspices of the Committee on Water Supply and Resources Management of the Environmental Engineering Division.

Edited by Gary S. Logsdon
Published by ASCE, 1988
112 pages, \$16.00

Energy/Environment Opportunities for Civil Engineers

Proceedings of sessions sponsored by the Energy Division — Nashville, TN — May 9-11, 1988. These papers discuss opportunities that have developed for engineers to solve problems resulting from the conflict between the need for energy development projects and the environmental acceptability of such project.

Edited by Ronald D. Neufeld
Published by ASCE, June, 1988
158 pages, \$16.00

Who's Who in Environmental Engineering

The source for those needing Board-Certified environmental experts with proven special knowledge; listed by specialty, state, and country.

Published by AAEE, April, 1988
166 pages, \$50.00

Critical Water Issues and Computer Applications

Proceedings of a conference sponsored by the Water Resources Planning and Management Division — Norfolk, Virginia — June 1-3, 1988.

Edited by Mike Strech
Published by ASCE, June, 1988
408 pages, \$35.00

Pipeline Infrastructure

Proceedings of a conference sponsored by the Pipeline Division — Boston, Massachusetts — June 6-7, 1988.

Published by ASCE, June, 1988
536 pages, \$44.00

Marine Treatment of Sewage and Sludge

Proceedings of a conference organized by the Institution of Civil Engineers — Brighton, England — April 29-30, 1987.

Published by Thomas Telford, Ltd., 1988
302 pages, \$86.00

To order contact:

ASCE Publications
345 East 47th Street
New York, NY 10017-2398
☎ (212) 705-7538

Environmental Engineering Selection Guide

The 1988 edition of the *Environmental Engineering Selection Guide* is now available from the American Academy of Environmental Engineers. Upon request, the *Guide* is provided free of charge to those that employ environmental engineers.

The *Guide* is useful for those seeking to locate environmental engineering experts for consulting assignments. It also lists the accredited environmental engineering programs at U. S. universities and professors who are certified environmental engineering

specialists. This year a new section has been included to list those certified environmental engineering specialists employed in the manufacture and selling of pollution control equipment.

The American Academy of Environmental Engineers, founded in 1955, is dedicated to quality in environmental engineering practice. Through the mechanism of specialty certification, it identifies for the public those individuals who have proven special knowledge in one or more of seven (7) areas of environmental engineering practice. The specialties certified by the Academy are: Air Pollution Control, General Environmental Engineering, Hazardous Waste Management, Industrial Hygiene, Radiation Protection, Solid Waste Management, and Water Supply/Water Pollution Control.

To obtain a free copy of the 1988 *Environmental Engineering Selection Guide*, write on your letterhead to the American Academy of Environmental Engineers, 132 Holiday Court, Suite 206, Annapolis, Maryland 21401.

PERSONAL ACCOMPLISHMENTS

AWWA Academic Achievement Awards

The American Water Works Association gives Academic Achievement Awards annually to the M.S. theses and Ph.D. dissertations judged to have the most significant value to the water supply industry. The awards consist of checks for \$1000 and \$500 for the first and second students in each category, respectively, and plaques for the students and their major professors.

The winners of the 1988 Academic Achievement Awards were:

Doctoral Dissertations

First Place: Barend F. Loubser. Colorado State University, under the direction of Dr. Johannes Gessler. Title: "Storage Sizing in Pipe Network Optimization".

Second Place: Donald L. Schlenger. The University of North Carolina at Chapel Hill, under the direction of Dr. Donald T. Lauria. Title: "The Application of Zonal Pricing to a Metropolitan Water Utility".

Master's Theses

First Place: William B. Dowbiggin. The University of North Carolina at Chapel Hill, under the direction of Dr. Philip C. Singer. Title: "Factors Affecting the Stability of Particles in Natural Waters and Their Susceptibility to Ozone-Induce Microfloculation".

Second Place: Steven R. Lavinder. Virginia Polytechnic Institute and State University, under the direction of Dr. Robert C. Hoehn. Title: "Evaluation of Activated Carbon Processes for Removing Trihalomethane Precursors from a Surface Water Impoundment".

Centennial Professor at Vanderbilt

The Department of Civil and Environmental Engineering at Vanderbilt University appointed **Richard E. Speece** as Centennial Professor of Civil and Environmental Engineering, on June 1, 1988. Dr. Speece won the AEEP Distinguished Faculty Award in 1970 and was AEEP Distinguished Lecturer in 1978. He won the Engineering Science Award for directing the outstanding Ph.D. dissertation in 1982. He served on the AEEP Board of Directors from 1980 to 1983 and presented the annual AEEP workshop at the Purdue Conference in 1985.

AWWA Best Paper Award

Professors **Robert C. Hoehn** and **John T. Novak**, and **William E. Cumbie**, a former student who is now an engineer with CH2M Hill Engineers at Reston, were awarded the American Water Works Association's 1988 Best Paper Award in the water quality division. The paper, which was published in the *Journal of the Association* in June, 1987, addressed the effects of storage and preoxidation on sludge and water quality.

ASCE's Julian Hinds Award

Robert L. Smith, Water Resources Consultant for Black and Veatch Consulting Engineers, Kansas City, MO, is the recipient of the American Society of Civil Engineers' (ASCE) 1988 Julian Hinds Award. Smith received the award for his contribution to the advancement of water resources planning and management, as an educator and as a local, state and national official. Prof. Smith has been involved in academia for over 40 years and since 1976 has held the position of Deane Ackers Professor of Civil Engineering at the University of Kansas. In addition, Smith has worked on a number of short-term consulting and advisory assignments for the Federal and State Governments.

The Julian Hinds Award was established in 1974 in recognition of the outstanding professional contribution of Julian Hinds, an Honorary Member of ASCE.

ASCE's Tipton Award

Syed S. Kirmani, consultant to The World Bank, Washington, D.C., has been named the winner of the American Society of Civil Engineers' 1988 Royce J.

Tipton Award. Kirmani has made significant contributions to the advancements of irrigation and drainage engineering.

Mr. Kirmani was the principal author of the Indus Basin Plan, an engineering solution used as the basis for settling the Indus Water dispute between India and Pakistan. Following the signing of the Indus Water Treaty in 1960, Kirmani was appointed Chief Engineer responsible for administering funds for implementing the Indus Basin Project, a resources development program comprised of two large dams, nine large inter-river link canals and six barrages.

ASCE's J. C. Stevens Award

Willi H. Hager, a Senior Research Engineer for the Swiss government, Lausanne, Switzerland, was named recipient of the American Society of Civil Engineers' (ASCE) 1988 J. C. Stevens Award.

The award, which was established in 1943 to give recognition to the best discussion published by ASCE in the field of hydraulics each year, will be presented to Hager for his discussion on the paper titled, "Separation Zone at Open Channel Junctions".

CONFERENCES AND EDUCATIONAL PROGRAMS

Call for Papers — 1988 AGU Fall Meeting, San Francisco

Symposium on Modeling Fate and Transport of Organics in Groundwater Systems

In the last few years, significant strides have been made in our ability to understand and model the processes associated with the transport and fate of organic chemicals in groundwater systems. Work is proceeding on the description of abiotic and biotic transformations as well as in the quantification of the physics of flow and transport processes. On-going investigations at a number of field sites are offering researchers the opportunity to test and calibrate conceptual models. Because of the complexity of real contamination scenarios, it is evident that future progress will be made primarily through the interdisciplinary cooperation of investigators from diverse backgrounds.

The Groundwater Committee of the American Geophysical Union is sponsoring a symposium designed to bring together such investigators to foster the exchange of information and ideas. The focus of the session will be the modelling of transport and transformation processes associated with organic chemical contamination of groundwater systems, as well as research concerned with characterizing and modeling geochemical processes and conditions

that are relevant to chemical speciation and to reaction equilibria and rates. Emphasis will be placed on the development and validation of mathematical models which describe such processes. Papers are solicited in this broad area and may include results of theoretical, numerical, experimental, or field studies. The symposium will be held at the AGU Fall Meeting in San Francisco, California, during the week of December 5-9, 1988. Both oral and poster presentations are planned. Those interested in contributing a paper should submit an abstract in standard AGU format by Sept. 9, 1988, to Dr. Linda M. Abriola, Department of Civil Engineering, The University of Michigan, Ann Arbor, MI 48109-2125, with a copy to Dr. Paul V. Roberts, Department of Civil Engineering, Stanford University, Stanford, CA 94305-4020. In addition, the original abstract and two copies must also be sent to AGU Meetings, 2000 Florida Avenue, Washington, D.C. 20009, by the Fall meeting abstract deadline. Further information on the symposium can be obtained by contacting Linda Abriola at (313) 763-9664 or Paul Roberts at (415) 723-1073.

Call for Papers — AWWA Universities Forum in Los Angeles

Abstract are now being solicited for papers to be presented at the 18th Annual Universities Forum at the American Water Works Association Annual Conference to be held in Los Angeles, June 18-22, 1989. Student presenters/authors are being sought at all

university levels. Papers must be based upon work done as a student during the 1987-1988 or 1988-1989 academic years.

Papers should be related to public water supply including treatment, quality control, distribution systems, and resource development and management. Seven copies of an abstract not to exceed 4 total pages — no more than 2 pages of text, no more than 2 pages of figures and tables, and a completed abstract information sheet (available from AWWA) — should be submitted by December 9, 1988, to:

Universities Forum
AWWA
6666 W. Quincy Avenue
Denver, CO 80235

Call for Papers — IXth Ozone World Congress

June 3-8, 1989, New York, New York

The International Ozone Association will hold its 9th Ozone World Congress in the New York Marriott Marquis hotel and is seeking papers to be presented at this biannual, international, scientific and technological meeting.

The subject matter may deal with new information concerning the generation, reactions and applications of ozone in such fields as:

Ozone Generation and Equipment
Analytical Methods and Instruments
Mass Transfer and Ozone Contactors
Ozone in the Atmosphere
Ozone-UV Reactions
Ozone-Hydrogen Peroxide Reactions
Disinfection and Byproducts
Medical Applications
Water Treatment
Wastewater, Ground Water Treatment
Aquatic Applications
Odor Control
High Purity Water Systems
Cooling Water Treatment
Swimming Pool and Spa Treatment
Chemical Processing

A brief (300 word) abstract should be submitted by October 1, 1988, to:

Scientific and Technical Program Committee
International Ozone Association, PAC
83 Oakwood Avenue
Norwalk, CT 06850, U.S.A.

The complete papers of the accepted presentations will be required by January 15, 1989. They will be included in the proceedings of the World Congress. The presentations are expected to be twenty minutes long, followed by a question and answer period.

For further information, please contact the Pan American Committee of IOA, 203-847-8169, or Dr. L. Joseph Bollyky, Chairman, Scientific and Technical Program Committee, 203-847-1506.

Call for Papers — Emerging Technologies for Hazardous Waste Treatment

American Chemical Society 1989 I&EC Division Winter Symposium, Atlanta, Georgia, May 1-4, 1989

Papers and presentations are invited that describe emerging technologies for treating gaseous, liquid or solid hazardous wastes. Contributors may focus on aspects ranging from fundamental research to demonstration programs for new technologies. Emerging technologies which may be applied to a variety of waste streams are particularly encouraged. Specific applications may include waste treatment for steel and metal manufacturing, oil refining, coal processing, textile, paint and dye production, chemical and pharmaceuticals manufacturing, and nuclear reactor and reprocessing operations. Technologies for water purification or the treatment of leachates from hazardous landfills or contaminated soils are also appropriate. Emerging technologies for other wastes will also be considered.

Contributors will be asked to provide draft copies of full manuscripts two weeks before the symposium. All papers will be peer reviewed to meet ACS standards. We are planning to publish a book as part of the ACS Symposium Series.

Send abstracts by October 1, 1988, to:

Dr. D. William Tedder
I&EC Division Winter Symposium Chairman
School of Chemical Engineering
Georgia Institute of Technology
Atlanta, GA 30332-0100, U.S.A.

Abstracts should be submitted on the standard ACS abstract forms. For more information call either (404) 894-2856 or (404) 973-3826. Contributors will be notified of acceptance by November 15, 1988.

SETAC Meetings

Ninth Annual SETAC Meeting

November 13-17, 1988, at Arlington, Virginia.
Theme: Reducing Uncertainty in Environmental Risk Assessments. Planned technical sessions include the following:

Molecular, Biochemical and Physiological Approaches to Ecotoxicology
Environmental Fate and Effects Modeling
Chemical Characterization and Toxicity Testing of Effluents

Biohazards in Drinking Water
 Applications of Biodegradation/Biotechnology
 to Hazardous Waste Reclamation
 Anaerobic Biodegradations of Xenobiotics
 Enhanced Bioreclamation for Aquifer Restora-
 tion
 Modeling Applications
 Environmental Chemistry
 Ecotoxicology of Agricultural Chemicals
 Behavioral Toxicology
 Environmental Analytical Chemistry
 Risk Assessment
 In-Place Pollutants and Sediment Toxicity
 Field Validation of Laboratory Results
 Carcinogenicity in Aquatic Species
 Aquatic Plant Toxicology
 Groundwater Contamination
 Regional Risk Assessments
 Metal Chemistry and Bioavailability in Acid Wa-
 ters
 Global Climate Changes
 Radon Gas Exposure and Risk Assessment
 Use of Expert Systems

Possible topics for Short Courses include:

QA/QC Procedures in Environmental Chemistry
 Laboratories
 Endangerment Assessments
 Exposure Modeling for Toxic Chemicals
 Toxicity Reduction Evaluations
 Ecological Risk Assessment

Contact:

Jerry Schnoor
 University of Iowa
 Environmental Engineering (2134 EB)
 Iowa City, IA 52422

Tenth Annual SETAC Meeting

October 28-November 2, 1989, in Toronto,
 Ontario, Canada. SETAC's first meeting outside the
 U.S. will emphasize Movement and Effects of Trans-
 boundary Pollution, particularly in the Great Lakes
 and in Europe.

Current plans include a special Tenth Anniversary
 Symposium on the past, present, and future of envi-
 ronmental toxicology and chemistry. Contact:

Peter V. Hodson
 Great Lakes Lab. for Fisheries and Aquatic Sc.
 Canada Centre for Inland Waters
 Box 5050
 Burlington, Ontario, L7T 2K2
 Canada
 ☎ (416) 336-4864

Engineering Foundation Conference

Engineering Foundation, in cooperation with the U.S.
 Environmental Protection Agency and the California

Department of Health Services, is sponsoring a con-
 ference on "Engineering for Waste Reduction — II", to
 be held October 9-14, 1988, at the Sheraton Hotel
 and Spa, Santa Barbara, California. This is the sec-
 ond in a series focusing on the emerging field of
 minimizing industrial and municipal waste at the
 source of generation. Conference Co-Chairmen are
 Harry Freeman, of EPA's Hazardous Waste Engineer-
 ing Laboratory and Arthur H. Purcell of the
 Washington-based Resource Policy Institute.

The conference will examine status and trends in
 waste reduction with the objective of formulating a
 comprehensive picture of technical and technically-
 related aspects of the field. It is designed to allow
 maximum exchange of information among partic-
 ipants. Its mix of plenary and informal sessions will
 include discussion in the following topic areas:

Overviews, Perspectives, Regulations and Legis-
 lation
 In-Plant Activities
 Reduction of Municipal Solid Waste
 Waste Reduction R&D and Risk Assessments
 Industry-Specific Considerations
 Solvents and Surface Coatings
 Safer Substitutes
 Industrial Waste Recycling
 Engineering Education, Training and Technol-
 ogy Transfer for Waste Reduction

Attendance at Engineering Foundation Conferences
 is by invitation or applications. Those wishing to at-
 tend should contact the Engineering Foundation for
 registration information. The conference fee, which
 includes registration, accommodations and meals
 from dinner on Sunday through lunch on Friday. The
 tentative prices are as follows:

Participant Double Occupancy (sharing room
 with another participant only) — \$575.00
 Participant Single Occupancy or sharing room
 with spouse, other family member, etc. —
 \$725.00
 Guest Fee Spouse, other family member, etc.,
 double occupancy (not attending techni-
 cal sessions) — \$275.00

For further information contact the Engineering
 Foundation, 345 East 47th Street, New York, NY 10017,
 USA. Telephone: (212) 705-7835. Cable: ENGFOUND
 NEW YORK. Telex: 126022.

IWEM Approves Training Material

The Institution of Water and Environmental Manage-
 ment has approved a course of distance learning
 material as suitable for students preparing for its Di-
 ploma examination. The course is produced by
 Flexible Learning Systems of Leicester.

The material produced by a consortium of Leicester
 Polytechnic, Imperial College and Loughborough
 University consists of 21 work units each requiring
 about 10 hours of self study. In connection with a
 work unit on the treatment and disposal of sludge,

IWEM recommends that students should also study the Institution's manual on "Conditioning and Dewatering of Sewage Sludge".

Details of the IWEM Diploma examination are available from Rachel Dudman, IWEM, London; ☎ 01-430-0949.

EMPLOYMENT OPPORTUNITIES

University of Colorado

Faculty Position in Environmental Engineering

A tenure track position in environmental engineering is available in the Department of Civil, Environmental and Architectural Engineering at the University of Colorado at Boulder. Duties include conducting sponsored research and teaching both graduate and undergraduate level courses. A candidate in the areas of either water chemistry, physical-chemical treatment processes or hazardous substance management and control is preferred. The Department is especially interested in an experienced individual to take a leadership role among a vigorous group of environmental and water resources engineering faculty. The position will be filled at the Full or Associate Professor level after January, 1989.

Send resumes and names of three references to Chairman, Environmental Engineering Search Committee, Dept. of CEAE, Campus Box 428, University of Colorado, Boulder, CO 80309-0428. Closing date for applications is October 15, 1988.

The University of Colorado at Boulder has a strong institutional commitment to the principle of diversity. In that spirit, we are particularly interested in receiving applications from a broad spectrum of people, including women, members of ethnic minorities and disabled individuals.

Cornell University

Temporary Environmental Engineering Faculty Position

The Environmental Engineering program in the School of Civil and Environmental Engineering at Cornell University seeks a temporary faculty member during the Fall 1988 semester. The position requires a PhD and suitable background. It is appropriate for an established faculty member on sabbatical leave from his or her university or a recent PhD seeking temporary experience on the Cornell Faculty.

The position is available while Professor Leonard Lion is on leave, and specific teaching duties most likely will be in the area of Professor Lion's specialties, aquatic chemistry and physical and chemical processes.

Prospective candidates should send a resume and letter of application to:

Richard I. Dick
118 Hollister Hall
Cornell University
Ithaca, New York 14853

An equal opportunity/affirmative action employer.

University of Delaware

Faculty Position in Environmental Engineering

The Department of Civil Engineering at the University of Delaware invites applicants for a tenured or tenure-track position in Environmental Engineering. The rank will depend on the qualifications and experience of the applicant. Expertise in hazardous waste or wastewater treatment will be preferred. Major responsibilities include teaching both undergraduate and graduate courses and developing a strong research program. Senior candidates must have an outstanding record of research; junior candidates will be expected to demonstrate exceptional potential for scholarly achievement. A Ph.D. degree and evidence of excellent teaching and research are required. Candidates with at least one degree or teaching experience in civil and/or environmental engineering are desirable. Applications received by November 30, 1988, will be given first consideration; however, the search will continue until the position is filled. Applicants should send a resume and the names of three references to: Professor C. P. Huang, Chair, Search Committee, Department of Civil Engineering, University of Delaware, Newark, DE 19716. *The University of Delaware is an Affirmative Action, Equal Opportunity Employer.*

University of Massachusetts

Postdoctoral Research Associate in the Environmental Engineering Program

A position is available at the postdoctoral associate level for research under the direction of Dr. David A. Reckhow in the Environmental Engineering Program at the University of Massachusetts. The preferred starting date is September 1, 1988, with an initial appointment of one year subject to renewal. Salary will

be \$23,000 for 12 months. Applications will be accepted until the position is filled.

Description of Research: This position is for full-time research on the reactions between ozone and natural aquatic organic matter. The research is funded by the US EPA, and it has important implications concerning the current use of ozone in drinking water treatment. Responsibilities include designing and conducting experiments to assess chemical kinetics and changes in gross characteristics of the organic matter as a result of ozonation. This work will include organic matter fractionation, functional group analysis, determination of aluminum and calcium complexation capacity, molecular size analysis, and perhaps GC/MS analysis of oxidation products.

Qualifications: Candidates should hold a Ph.D. in environmental engineering or environmental chemistry. Research experience in chemical kinetics, trace organic chemical analysis, and ozone treatment of drinking water is preferred, but not required.

Persons wishing to be considered for this position should send a curriculum vita, three letters of recommendation, and a statement of research interests to Dr. David A. Reckhow, Department of Civil Engineering, University of Massachusetts, Amherst, MA 01003. *The University of Massachusetts is an equal opportunity employer.*

Stanford University

Faculty Position in Atmospheric Transport and/or Air Quality Engineering

The Department of Civil Engineering at Stanford University is seeking a tenure-track Assistant Professor in the field of atmospheric transport and/or air quality engineering. The new professor will teach graduate courses and conduct research in one or more of the following areas: physical and chemical fundamentals of air quality; atmospheric transport of contaminants, including regional and global effects; the impact of air quality changes on human health and the environment; and air pollution control. In research, the candidate preferably should offer a balance of interest in experimental and computational work, with emphasis on understanding the relevant physical and chemical processes and their effects.

The Department of Civil Engineering has 25 professors and approximately 225 graduate students and

60 undergraduate students. The new position offers opportunity for interactions with strong existing programs in environmental engineering and science, hydrology and fluid mechanics, mechanical engineering, biological sciences, chemistry, chemical engineering and earth sciences.

The position is available as early as September 1, 1989. *As an equal opportunity employer through affirmative action, Stanford University especially encourages applications from qualified women and ethnic minorities.* Applicants should send their resume, publication list, and names of references as soon as possible, but no later than 30 November 1988, to Professor Paul V. Roberts, Department of Civil Engineering, Stanford University, Stanford, CA 94305-4020.

Radian Corporation

Radian Corporation has opportunities for entry level and experienced individuals in the areas of environmental science and engineering. Entry level candidates must have BS/MS in environmental, civil, mechanical engineering, or related technical degree with 0-5 years experience. Experienced candidates should have MS/PhD in environmental engineering or related field with 5-10 years experience. With either position type, experience may be substituted for degree requirements. Person will work on projects for private industry and government involving pollution source evaluation, permit acquisition, development and implementation of federal/state regulations, and compliance management services. Experience in environmental project management, air toxics, dispersion modeling, hydrology, air, water, and RCRA permitting, hazardous waste management, natural systems modeling, and air and water pollutant control technology is desirable.

Essential requirements for these positions are strong interpersonal skills, the ability to communicate at all technical levels, and good technical writing skills. In addition to challenging work, RADIAN offers opportunity for professional growth and competitive employee benefits. Interested persons should submit resume to:

Radian Corporation
Human Resources Department
P.O. Box 13000
Research Triangle Park, NC 27709.

An Equal Opportunity Employer.

APPLICATION FOR MEMBERSHIP in the Association of Environmental Engineering Professors

Name _____

Official Title _____ Dept. _____

Business Address _____ Tel. _____

Home Address _____ Tel. _____

Applying for: Membership Status Rank: _____ Affiliate Status

PLEASE ATTACH RESUME

Dues are payable to the Association on a calendar year basis.
The AEEP annual dues payment, prorated according to the date of application, is shown below.

INITIAL DUES PAYMENT REQUIRED BASED
ON RANK AND DATE OF APPLICATION

RANK	1 Jan.	1 Apr.	1 July	1 Oct.
	31 Mar.	30 June	30 Sept.	31 Dec.
Professor	\$50.00	\$37.50	\$25.00	\$12.50
Associate Professor	25.00	18.75	12.50	6.25
Assistant Professor	25.00	18.75	12.50	6.25
Affiliate Member	20.00	15.00	10.00	5.00

Please return this form along with your dues to:

Desmond F. Lawler
Department of Civil Engineering
University of Texas
Austin, TX 78712

Enclosed are my AEEP dues in the amount of: \$ _____

Signature Date

ASSOCIATION OF ENVIRONMENTAL ENGINEERING PROFESSORS

TWENTY-FIFTH ANNIVERSARY LUNCHEON

3 OCTOBER 1988
11:45 A.M.
HYATT REGENCY HOTEL, DALLAS
AT
REUNION GRAND BALLROOM

COST: \$15.00

PROGRAM

DR. EARNEST F. GLOYNA, P.E.
Vision of the founders of the
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DR. RICHARD G. LUTHY, P.E.
Vision of the
Association of Environmental Engineering Professors
Twenty-Five Years Later

PRESENTATION OF OUTSTANDING DISSERTATION AWARDS
Engineering-Science Award
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Reservations are required. This is a sit down function. The hotel requires that the number of meals to be served be guaranteed by 30 September 1988. Reserve your place today. Complete and return the attached reservation form to (or call): Dr. Desmond F. Lawler, P.E., Civil Engineering Department, ECJ 8.6, The University of Texas, Austin, Texas 78712; ☎ 512/471-4595.

RESERVATION

AEEP 25th ANNIVERSARY LUNCHEON
3 OCTOBER 1988, DALLAS, TEXAS

Please reserve a place for me at the AEEP Anniversary luncheon.

- My check in the amount of \$15.00 is enclosed.
 I will attend the luncheon and will pay at the door.

Name: _____

Address: _____

State: _____ Zip: _____

Return the completed form to or call (512) 471-4595:

Desmond F. Lawler, P.E.
Civil Engineering Department
ECJ 8.6
The University of Texas
Austin, Texas 78712

**Association of Environmental Engineering Professors
Conference on
Fundamental Research Directions in Environmental Engineering
November 13-15, 1988, Arlington, Virginia**

Conference Chair: Richard G. Luthy, Carnegie Mellon University

Conference Co-Chairs: James J. Morgan, California Institute of Technology
Charles R. O'Melia, The Johns Hopkins University

Session Chairs:

Physical Processes
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Philip C. Singer, University of North Carolina

Biological Processes
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Registration Application

Name: _____

Address: _____

Registration Fee: AEEP member \$95.00

Non-member \$150.00

Please respond by November 1, 1988.

Make check payable to: *CMU Department of Civil Engineering — AEEP Conference.*

Return this portion of the registration form to:

**Mrs. Maxine Leffard
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Pittsburg, PA 15213-3890**

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Association Of Environmental Engineering Professors

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