AEESP Newsletter
Association of Environmental Engineering and Science Professors
Volume 39, No. 2 Published three times yearly by the Association of Environmental Engineering & Science Professors April 2004

President's Letter

In this issue...

AEESP News.....2
Member News.....4
Programs and Organizations.....6
Employment Opportunities.....8
Book Reviews.....9
Conferences/ Call for Papers.....14
Member Application.....15

News from Washington
...see page 2

Marc Edwards

I was recently made painfully aware that an intensive effort on behalf of public health, with significant costs to my own wellness and professional reputation, has led to passage of an entire year in which my family was neglected. Hopelessly juxtaposed with that depressing realization –a quotation taught to me by my own nearly perfect parents:

> *Never give in. Never give in. Never, never, never, never – in nothing, great or small, large or petty – never give in, except to convictions of honour and good sense.*
>
> -Winston Churchill, 1941

While the phrase "honour and good sense" is open to interpretation, the impossible task we professors sometimes face balancing family and work is not.

Dedicated to Ailene (2), Ethan (4) and Jui-Ling (41).
Marc A. Edwards
President, AEESP

Letter to the Editor

[Editor's Note: Former AEESP President Michael Aitken began a discussion on the definition of environmental engineering (April 2002 AEESP Newsletter). In this discussion, he stated that the entire community of environmental engineers needs to work together to define environmental engineering. This discussion was continued by Past President Catherine Peters (April 2003 AEESP Newsletter) and current President Marc Edwards (January 2004 AEESP Newsletter). The letter below is in response to the January 2004 President's Letter. In an effort to encourage discussion on this topic, letters such as the one below will be published in the Newsletter when space is available. Please consider submitting your thoughts on this topic.]

Dear Editor,
I enjoyed President Marc Edwards's definition of the work of environmental engineers as "Saving Mankind from Itself."

Many years ago I described it as "controlling our environment without destroying it." Marc's definition is more catchy, reminiscent of Pogo.

I often referred to environmental engineering as a self-sustaining profession. How often have we solved one problem, only to create two new ones that show up later? And of course we solve an air pollution problem by installing a scrubber, thereby creating a water pollution problem, which, in turn, we solve by treatment that creates a sludge, thereby creating a solid waste problem, which, in turn, we solve by incineration, thereby creating an air pollution problem….We have to face the fact that we all want an easy life, but to achieve this we may have to create more problems. No, I don't think we will ever run out of a need for environmental engineers and scientists. We all have a job to help sustain life on our planet.

Sincerely,
Donald B. Aulenbach, Ph.D., P.E., D.E.E., P.H.
Clifton Park, NY

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News from Washington

On March 4, 2004, Allen Davis of the University of Maryland and Charles Driscoll of Syracuse University visited the offices of Senators Hillary Rodham Clinton (D-NY) and Paul Sarbanes (D-MD), and Representatives Sherwood Boehlert (R-NY 24th), Wayne Gilchrest (R-MD 1st), Chris Van Hollen (D-MD 8th), and James Walsh (R-NY 25th) as representatives of AEESP. Discussions centered on funding for NSF and EPA extramural research programs, with requests for support for both agencies. Specific emphasis was placed on the EPA STAR program, highlighting both the research and fellowship components. Environmental issues discussed included Chesapeake Bay water quality, mercury in the environment, and lead in drinking water. As a parting proposition, AEESP assistance was offered on environmental issues.

All congressional staff members indicated support for our request. Nonetheless, all expressed concern that this year's budget is the tightest seen in several years. Of particular concern is that the Administration budget request funds the EPA STAR at only 70% of the 2004 program. Extramural research grants and graduate fellowships would be severely cut under this request. The STAR graduate fellowship program would be cut by 33.5 percent ($3.1 M) relative to the FY2004 enacted level. Approximately 30 percent or $36 million would be cut from EPA's STAR research grants program. According to EPA's justification to Congress, approximately 93 fewer STAR research grants would be awarded. For NSF, the Administration request has a 3% increase above FY2004 funding. This is significantly below the pace authorized for doubling NSF funding from 2003 to 2008. The FY2005 budget request funds the Bioengineering and Environmental Systems Program at 2.5% less than FY2004.

Nonetheless, NSF and EPA research programs have strong Congressional support. Four members of Congress are key to extramural environmental research funding. These are the Ranking Members of the appropriations subcommittee for VA, HUD, and Independent Agencies (which include EPA and NSF). In the Senate, the leaders are Senators Christopher Bond (R-MO) and Barbara Mikulski (D-MD); in the House, they are representatives Walsh and Alan Mollohan (D-WV). AEESP will draft letters to these members of Congress describing the importance of federal environmental research programs and urging continued support.

Other key Congressional environmental and science contacts include Senators James Inhofe (R-OK) and James Jeffords (I-VT), and Representatives Eddie Bernice Johnson (D-TX) and Vernon Ehlers (R-MI). Nonetheless, any congressional contact is valuable. Any AEESP member willing to send a letter in support of environmental research and education may contact Allen Davis for assistance with a letter template and contact information.

AEESP is also expanding activities to have its members placed on key committees in EPA, GAO, and other federal organizations. These placements should increase the visibility of our membership and allow the Association to play a larger role in the programs administered by these organizations.

Information on federal funding for federal environmental programs can be accessed at the website of the National Council for Science and the Environment (www.ncseonline.org/).

AEESP Lectures Committee

At its fall meeting, the AEESP Board decided to consolidate all activities associated with the selection of speakers and lecturers under one committee. The new committee will oversee selection of the AEESP Distinguished Lecturer for the university lecture tour, as well as a speaker for the WEFTEC Scientists Luncheon, and the AWWA and AWMA annual conferences. The committee will develop a formal process for the selection of all lecturers and better documentation of the committee's responsibilities and activities for the AEESP Administrative Handbook. The new AEESP Lecturers Committee will be chaired by Morton Barlaz. Committee members include Sarina Ergas, Steve Randtke, Phil Singer, Barth Smets, and Mark Wiesner.

The committee is pleased to announce that Dr. Bruce Rittman has been selected as the 2004

AEESP Distinguished Lecturer. Dr. Rittman's lecture tour will be held during the Fall 2004 semester. A solicitation for schools that are interested in hosting Dr. Rittman will have been distributed via the AEESP e-mail list in March. Dr. Rittman plans to offer two talks: (1) The Hydrogen-Based Membrane Biofilm Reactor for Removing Oxidized Contaminants and (2) The Role of Molecular Methods in Environmental Biotechnology. People with suggestions for nominees for future lectures are invited to contact any committee member.

AEESP Lecture at AWWA Conference

The AEESP Lecture at this year's AWWA Conference in Orlando, FL will be presented by Professor Mark M. Benjamin of the University of Washington. The title of his lecture is "Differential Spectroscopy: A Simple and Under-Utilized Tool for Analyzing and Modeling DBP Formation," and it is scheduled to be presented on Tuesday, June 15, 2004 from 1:00 to 1:50 pm (not on Monday, as in the past!). The lecture is sponsored by Black & Veatch, a Sustaining Member of AEESP.

2005 AEESP Conference

Mark your calendars for the 2005 AEESP Conference at Clarkson University! Clarkson and Syracuse Universities are pleased to have been selected as hosts of the 2005 AEESP Conference. The conference will take place at Clarkson University in Potsdam, NY **July 24-27, 2005**, with an optional pre-conference Saturday field trip scheduled in Syracuse, NY. Clarkson University is situated in the foothills of the Adirondack Mountains, an hour away from Lake Placid, NY, with excellent options for pre- and post-conference activities.

The theme of this conference, *Pushing the Boundaries: Making research and education in environmental engineering and science count*, will explore ways that AEESP members are expanding their boundaries through interdisciplinary and/or multi-media activities, or by expanding the breadth of the intended audiences of their research and education activities. The overall goal of this conference will be to increase each participant's awareness of the wide range of opportunities for environmental engineering and science professors especially in light of the recent multi-media and interdisciplinary research initiatives by federal funding agencies.

The conference will include:

- Contributed and invited pre-conference workshops
- Both plenary and concurrent sessions to increase the number of presentations and diversity of presenters
- Poster sessions that include sponsored awards for graduate students and new professors
- A substantial afternoon break on Monday to allow recreation time for networking and rejuvenation followed by evening oral sessions
- Dissemination of conference presentations and findings through publication of selected peer-reviewed papers in the journal *Environmental Engineering Science*

A Call for Abstracts will be distributed in Fall 2004, with abstracts expected to be due February 1, 2005. Please contact one of the conference organizers, Susan Powers (sep@clarkson.edu) or Amy Zander (zander@clarkson.edu), with any questions.

AEESP Newsletter policies

Submissions deadline

The AEESP Newsletter is published three times a year in January, April, and September. The deadline for newsletter submissions is one month prior to the publication date. Please keep in mind when submitting items with deadline dates that members receive issues four to six weeks after the submissions deadline.

Advertising policy

Any advertisement, including faculty, post-doc, or student ads, or other types of announcements submitted by an AEESP member, will be free for the first 250 words (approximately 1/4 page) and then charged at $1 per word for additional content, if formatted to fit in a column. Non-members will be charged at the per word rate for any size column-formatted ad. Full page formatted advertisements will be charged at $500 for members and $1,000 for non-members. All formatted full page ads will be accompanied by a free web ad.

Photo submissions

Photo submissions to the AEESP Newsletter are encouraged. Please submit your photos electronically (to amyec@unr.edu) in jpeg format at the highest dimension for downsizing to print resolution (preferably less than 750 KB). Also, please include captions with names, locations, and dates.

Jennifer Woertz

Robert Nerenberg

University of Notre Dame

The Civil Engineering and Geosciences Department at the University of Notre Dame is pleased to announce the addition of two environmental engineering faculty, **Dr. Jennifer Woertz** and **Dr. Robert Nerenberg, P.E.**

Dr. Woertz received her Ph.D. from the University of Texas at Austin in 2002. Her research centers on the treatment of hazardous air pollutants using fungal-based biofilters, the use of molecular techniques to enhance treatment process efficiency, and indoor air quality. Prior to joining Notre Dame, Dr. Woertz was Visiting Assistant Professor at Rensselaer Polytechnic Institute.

Dr. Nerenberg earned his Ph.D. at Northwestern University in 2003. He specializes in biological treatment processes, including removal of perchlorate and other micropollutants, the hollow-fiber membrane biofilm reactor, and use of molecular tools to study mixed-culture microbial systems. Dr. Nerenberg has over 8 years of professional experience, including 5 years with Montgomery Watson Harza in Chicago, IL.

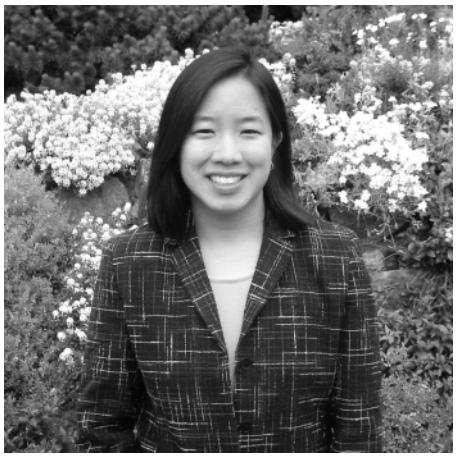
Clemson University

Dr. Yanru Yang joined the faculty of the Department of Environmental Engineering & Science at Clemson University as an assistant professor in January 2004. Dr. Yang obtained her Ph.D. in Environmental Engineering from Tsinghua University (Beijing, China) in 1996. The focus of her dissertation was hazardous waste management. Dr. Yang then served as a Postdoctoral Fellow (1996-1999) and Research Associate (1999-2001) in the Department of Civil and Environmental Engineering at Stanford University, where she worked primarily with Perry McCarty. Dr. Yang then received an appointment as a Senior Scientist (2001-2003) at the Institute of Terrestrial Ecology in the Swiss Federal Institute of Technology, where she worked mainly with Josef Zeyer. Her area of expertise is biological processes and her interests include biodegradation of hazardous substances, microbial community structure in natural and engineered systems, and the application of molecular biology techniques to environmental systems. Dr. Yang has published research results on the competition for hydrogen within mixed cultures that dehalogenate chlorinated solvents; the use of biomass, oleate, and other substrates as electron donors for chloroethene reductive dechlorination; biologically enhanced dissolution of tetrachloroethene DNAPL; and detection of *Dehalococcoides* species by fluorescence in situ hybridization with 16S rRNA-targeted oligonucleotide probes. At Clemson University, Dr. Yang plans to extend her research focus to the microbial communities involved in biogeochemical processes and water and wastewater treatment processes.

Yanru Yang

Virginia Tech

Dr. Linsey C. Marr recently joined the Department of Civil and Environmental Engineering at Virginia Tech. Her research focuses on urban- and regional-scale air quality modeling, emissions characterization, and particulate polycyclic aromatic hydrocarbons (PAHs). She received her B.S. (1996) in Engineering Sciences from Harvard College and M.S. (1997) and Ph.D. (2002) in Environmental Engineering from the University of California at Berkeley. Following completion of her Ph.D., Dr. Marr worked as a postdoctoral associate with Dr. Mario Molina at MIT and traveled extensively to Mexico City to study emissions from motor vehicles. Dr. Marr is a welcomed addition to the faculty as she will expand course offerings and research in air pollution. She is teaching undergraduate and graduate courses in air quality engineering as well as Introduction to Environmental Engineering.


Linsey Marr

In memoriam...
Frederick G. Pohland, PhD, PE, DEE

Dr. Frederick G. Pohland died January 9, 2004, in Pittsburgh, PA at the age of 72. A memorial service, attended by many of his colleagues and former students, was held January 23, 2004, in Heinz Memorial Chapel on the campus of the University of Pittsburgh. Dr. Pohland devoted most of his professional career to engineering education, research, and service; initially at the Georgia Institute of Technology and then at the University of Pittsburgh. At the time of his passing, he was a Professor and Edward R. Weidlein Chair of Environmental Engineering, Director of the Dominion Center for Environment and Energy, and Co-Director of the Groundwater Remediation Technologies Analysis Center at the University of Pittsburgh.

Dr. Pohland made significant contributions to the field of environmental engineering and was a pioneer in the area of sanitary landfill management. In 1966, Dr. Pohland conceived of a unique approach (the bioreactor landfill) to enhancing the waste degradation process within a landfill. This concept went against the regulatory mindset of waste containment to exclude moisture from landfills. As with most things he encountered during his long and distinguished professional career, pursuit of this research direction required courage, tenacity, and innovation.

Dr. Pohland received his B.S. in Civil Engineering from Valparaiso University and, after being employed as an engineer with the Erie Railroad Company, completed service with the U.S. Army and then graduate studies at the M.S. and Ph.D. levels in Environmental Engineering at Purdue University. Dr. Pohland also had been a Visiting Scholar at the University of Michigan and a Guest Professor at the Delft University of Technology in The Netherlands.

A Fellow and Life Member of the American Society of Civil Engineers (ASCE), and a registered Professional Engineer, Dr. Pohland was also a Diplomate in the American Academy of Environmental Engineers (AAEE), having previously served as President, Trustee, and AAEE delegate to the Board of Directors of the Accreditation Board for Engineering and Technology (ABET), where, at the time of his passing, he was a member of the Engineering Accreditation Commission. He served on the Governing Board of the International Water Association (IWA) and as Honorary Executive Editor and Regional Editor of the IWA Journal, *Water Research*. He also originated and chaired the IWA Specialist Group on Anaerobic Digestion and the IWA Specialist Group on Landfill Management of Solid Wastes. Dr. Pohland was active in the Water Environment Federation (WEF), where he served on the Board of Control and was Chair of the Program Committee. Other memberships included the American Chemical Society, American Institute of Chemical Engineers, American Society for Microbiology, American Water Works Association, Association of Environmental Engineering and Science Professors, Solid Waste Association of North America, National Society of Professional Engineers, and the Society for Industrial Microbiology.

Dr. Pohland served as a consultant and advisor to industry and government, including appointments to the Science Advisory Board of the U.S. Environmental Protection Agency, the Science Advisory Committee of the Gulf Coast Hazardous Waste Research Center, the Science Advisory Committee of the Electric Power Research Institute, the Industrial Advisory Committee of the DOD Advanced Applied Technology Demonstration Facility, and the Scientific Advisory Committee of the National Institute for Environmental Renewal. National Research Council Committees included Water Resources Research, Innovative Technologies, Landfills, Subsurface Contamination, Environmental Remediation at Naval Facilities, Biosolids, and Advanced Technology for Human Support in Space. He was a frequent contributor to literature, with over 150 technical and scientific publications, many of which focused on anaerobic

Frederick C. Pohland Memorial Fund

The family and friends of the late **Frederick G. Pohland** have established a memorial fund to create awards by selected professional organizations in his honor. Those interested in participating in this tribute may contact Herb Ward at wardch@rice.edu.

digestion; solid and hazardous waste management; environmental impact assessment; and innovative technologies for waste minimization, treatment, and environmental remediation.

Among Dr. Pohland's honors and awards were the WEF Harrison Prescott Eddy Medal, Charles Alvin Emerson Medal, and Gordon Maskew Fair Medal; the Research Award of the Water Pollution Control Association of Pennsylvania; Life Member of the American Water Works Association; 1992 Distinguished Lecturer of the Association of Environmental Engineering and Science Professors; and 1992 Lawrence Lecturer of the Solid Waste Association of North America. In 1993, he was elected to the National Academy of Engineering, Fellow of the American Academy of Microbiology, and an Honorary Member of the Water Environment Federation. He received the 1995 AAEE Stanley E. Kappe Award, and was awarded an Honorary Degree of Doctor of Science by Valparaiso University in 1996. In 2000 he received the AAEE Gordon Maskew Fair Award and IWA Honorary Membership. He was the ASCE Simon Freeze Memorial Lecturer for 2001. He received the AEESP Frontier of Research Award in 2003.

Dr. Frederick G. Pohland had an incredible record of service to the environmental engineering profession. In a world that has become increasingly demanding on academics, his commitment to service was truly remarkable. His guidance and leadership will be missed by his family, friends, colleagues, and students.

AEESP members may submit 'Member News' items to Amy E. Childress, AEESP Newsletter Editor, amyec@unr.edu.

The submissions deadline for the September 2004 AEESP Newsletter:

August 2, 2004

Carnegie Mellon announces the Steinbrenner Institute for Environmental Education and Research

Last year Carnegie Mellon Trustee W. Lowell Steinbrenner and his wife, Jan, pledged seed funds of $4 million to set up the Steinbrenner Institute for Environmental Education and Research (SEER). The institute will aid Carnegie Mellon's ambitious long-term strategic plan to change the way society thinks and acts about the environment through its educational and research methods and results, through the issues it raises, and through the outcomes it produces.

SEER's initial focus will be centered on two critical environmental themes: energy and the environment, including electricity and energy for transportation; and urban infrastructure in both developed and developing regions, including the urban and natural environment in urban regions.

SEER will also be charged with coordinating and enhancing the impact of environmental research and education campuswide. The educational focus will include an emphasis on helping all Carnegie Mellon undergraduate students understand the problems, methodologies, and practical solutions that can lead to a more sustainable world. Already, the Steinbrenner Institute has allocated more than $70,000 in grants to a variety of research and educational initiatives, including a conference booklet for the upcoming North American conference of the Society of Environmental Journalists, which will take place October 20-24, 2004 at Carnegie Mellon.

Chris Hendrickson, head of the Department of Civil and Environmental Engineering, is the Faculty Director of SEER. Dr. Deborah Lange, Executive Director of Carnegie Mellon's Brownfields Center since 1997, will be the Executive Director of SEER. The SEER web page will be housed at www.cmu.edu/environment.

AEESP members:

Have you moved or has your address changed?
Send address changes to:

Joanne Fetzner
AEESP Business Office
2303 Naples Court
Champaign, IL 61822

Update on WERF activities

by John T. Novak

The Water Environment Research Foundation (WERF) continues with its research program, but with some significant changes. WERF has added two new research areas to their program, Stormwater and Decentralized Systems. The current thrust areas for WERF now include:

- Collection and Treatment
- Watershed Management and Ecosystem Sustainability
- Human and Environmental Health
- Stormwater
- Decentralized Systems

The area with the largest share of funding is Collection and Treatment and this is in response to subscribers' interests. The Decentralized Systems area is funded separately by an EPA grant and will continue only as long as the EPA funding continues.

All RFPs are posted on the WERF web site. Because RFPs are issued throughout the year, it is important to check monthly if you think there may be projects that are in your areas of interest.

WERF does not have funds set aside for unsolicited proposals. Each of the thrust areas listed above has the option of setting aside some funds each year for unsolicited proposals. This past year, the Collection and Treatment area set aside $300,000 (3 projects at $100,000 each) for unsolicited proposals, but was the only area to do so. It is likely that additional funds will be provided for unsolicited projects this year, but the amount of money will likely be less than $500,000.

IGERT PhD Traineeships in Sustainability

With a grant from the National Science Foundation's Integrative Graduate Education and Research Traineeship (IGERT) Program, Michigan Technological University, Southern University, and A&M College have created an interdisciplinary graduate program for students who wish to develop an integrated scientific and social basis for decision-making on sustainability issues. Research thrusts include environmental, industrial, societal, and integrative sustainable systems.

Students with backgrounds in engineering, all sciences (including the social sciences), and economics may apply. The Ph.D. degree will be awarded in the following five areas: environmental, civil, mechanical, and chemical engineering; and public policy.

All IGERT trainees are provided an annual stipend of $27,500; payment of tuition and fees; and an internship with industry, government, or a non-governmental organization. Funding is also available to support international experiences related to sustainability, which will take place in Africa or Central America/Caribbean. Students are required to spend at least one semester taking coursework at the partner institution. For engineering students located at Michigan Tech, this means they can take coursework at Southern University's Nelson Mandela School of Public Policy and Urban Affairs.

Michigan Tech is rated as the Nation's 8th safest college town and the area's natural beauty has been recognized by *National Geographic Adventure Magazine*, which recently rated it as a "Top Ten Summer Sports Mecca." The area also provides abundant winter outdoor recreation that is supported by Mt. Ripley, the university-downhill ski slope, and a premier cross-country ski facility. Southern University is situated in Louisiana's state capital of Baton Rouge, where students can experience the unique food, Creole culture, Cajun zest, and lively music scene that makes Baton Rouge a special place.

Further information about the program may be obtained by contacting: Dr. James R. Mihelcic (jm41@mtu.edu), Co-Director, Sustainable Futures Institute or Dr. Neil J. Hutzler (hutzler@mtu.edu), Michigan Technological University; Dr. Valentine James (valentineudohjames@yahoo.com), Southern University; or by accessing our website at: www.sustainablefutures.mtu.edu/IGERT.

Michigan Tech is an equal opportunity educational institution/equal opportunity employer.

NSF Water Quality Workshop

The National Science Foundation sponsored a workshop on Advancing the Quality of Water (AQWA) March 10-12, 2004 in the School of Public Health at the University of North Carolina at Chapel Hill. The objectives of the workshop were to set an agenda for fundamental drinking water quality research over the next 5-10 years, to define and delineate grand challenges in the field of drinking water quality control, and to assess the implications of developments in nanotechnology, biotechnology, and cyber-infrastructure for research on advancing drinking water quality. The workshop was hosted by the School of Public Health's Drinking Water Research Center, with Environmental Sciences and Engineering's Dr. Philip C. Singer serving as local coordinator, and Drexel University's Charles N. Haas as principal investigator for the NSF-funded workshop.

Some 45 experts in the field of drinking water treatment and associated scientific disciplines were invited to attend the workshop. The workshop consisted of plenary presentations by five resource speakers in the areas of biotechnology, nanotechnology and materials, cyber-infrastructure, chemistry, and novel processes, followed by break-out sessions in which the participants defined research needs in each of the five areas, culminating in plenary discussions reviewing the research needs identified. A final report will be prepared summarizing the findings of the workshop that are intended to provide a framework for NSF's research agenda in drinking water quality for the next 5-10 years.

Employment Opportunities

University of Nebraska-Lincoln

ASSISTANT/ASSOCIATE PROFESSOR, WATER RESOURCES ENGINEERING.

The University of Nebraska-Lincoln, Department of Civil Engineering (Omaha Campus) invites applications for a tenure-track position in Water Resources Engineering. Expertise in one or more the following disciplines is desirable: environmental hydraulics, water resources planning/management, and surface or subsurface hydrology. This position (which is available on August 16, 2004) will be located in the Peter Kiewit Institute on the Omaha campus of the University.

Candidates must have an earned doctorate in civil/water resources engineering and an undergraduate civil engineering degree is preferred. Applications including a cover letter; a complete resume; and names, addresses, e-mail addresses, and telephone numbers of at least three references should be sent to: Dr. John Stansbury, Search Committee Chair, UNL Department of Civil Engineering, 205C PKI, 1110 South 67th Street, Omaha, NE 68182-0178. Review of applications will begin on May 15, 2004 and will continue until the position is filled.

The Department of Civil Engineering has 24 faculty positions on the Lincoln and Omaha campuses of the University of Nebraska with an ABET/EAC accredited undergraduate curriculum and advanced programs leading to M.S. and Ph.D. degrees. Additional information can be found on the Department's web site: www.civil.unl.edu/. The University of Nebraska is committed to a pluralistic campus community through Affirmative Action and Equal Opportunity, and is responsive to the needs of dual career couples. We assure reasonable accommodation under the Americans with Disability Act. Please contact Dr. John Stansbury at 402-554-3896 for assistance.

North Carolina State University

TENURE-TRACK FACULTY POSITIONS IN WATER RESOURCES OR COASTAL ENGINEERING.

The Department of Civil, Construction and Environmental Engineering at North Carolina State University invites applications at the assistant professor level (higher ranks will also be considered) for one or more tenure-track faculty positions in water resources or coastal engineering. Applicants with expertise in hydraulics, hydrology, coastal processes and hydrodynamics, environmental fluid mechanics, and water resources systems are of special interest, although exceptional individuals who complement or strengthen other areas in water resources engineering will also be considered. Candidates are expected to develop and maintain an internationally recognized research and education program; to participate in collaborative and interdisciplinary research; and to teach undergraduate and graduate courses. An earned doctorate degree in civil engineering or a closely related field is required. The starting date, August 16, 2004 or later, is negotiable. Interested applicants should submit a complete resume including a statement of research and teaching interests, transcripts of graduate work, and contact information for at least three references to Professor E. Downey Brill, Head, Department of Civil, Construction and Environmental Engineering, North Carolina State University, Box 7908, Raleigh, NC 27695-7908. Telephone: 919 515 7212. Additional information about the department can be found at www.ce.ncsu.edu.

NC State University is an Equal Opportunity and Affirmative Action Employer. In addition, NC State welcomes all persons without regard to sexual orientation. Individuals with disabilities desiring accommodations in the application process should contact Barbara Rowe at 919-515-3329 or browe@eos.ncsu.edu.

University of Oklahoma

POSTDOCTORAL POSITION IN ABIOTIC NATURAL ATTENUATION OF GROUNDWATER.

We are seeking a postdoctoral scientist or engineer to work on an exciting collaborative project between the School of Civil Engineering and Environmental Science, the Department of Botany and Microbiology, and the School of Geology and Geophysics at the University of Oklahoma. The overall objective of the research is to develop and apply geochemical methods to quantify the rates of abiotic natural attenuation at sites contaminated with PCE and TCE. Applicants should possess a Ph.D. in environmental engineering, environmental microbiology, or a related discipline. Project details and application instructions can be found at http://coecs.ou.edu/Elizabeth.C.Butler/postdoc.htm. For questions, please contact Liz Butler at 405-325-3606 or ecbutler@ou.edu.

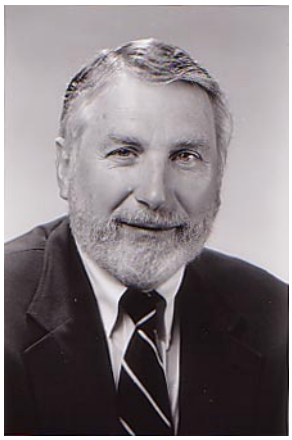
Solution Manual for Transport Modeling for Environmental Scientists and Engineers

A solution manual for Clark's "Transport Modeling for Environmental Engineers and Scientists" (Wiley, 1996), is available from the author. Please e-mail Mark Clark at mmclark3@uiuc.edu for details on how to order. The cost is $25 plus postage.

Errata for the 4th and earlier printings of the book are also available from Clark via e-mail.

Riverbank Filtration: Improving Source-water Quality

Chittaranjan Ray, Gina Melin, and Ronald Linsky, Kluwer Academic Publishers, Dordrech (Germany), in collaboration with the National Water Research Institute of Fountain Valley, California, 2002



Aarne Vesilind

As everyone of my vintage knows, dissolved oxygen used to be measured by a chemical technique called the Winkler test which required the addition of four different chemicals and a titration – not a simple undertaking. The test was destructive, so if it was used for BOD measurement, the bottle tested was no longer available for incubation. This requirement led to a large number of bottles being incubated, and a large number of Winkler tests run.

In the 1960s we were learning how estuaries flushed themselves, and one of the variables was how the BOD of the water in the estuary was progressively reduced by the flushing. The Delaware Estuary Study was a large project which would show how the effects of pollutants (and their control) would affect water quality. The technical director of the study was our own Bob Thoman, later to have a distinguished career at Manhattan College. As a part of this study, a group of young interns was detailed to run up and down the estuary in a motor boat taking samples at specified locations, bringing these samples back to the laboratory, and running the BODs.

As the first large batch (well over 100) of bottles came in, one of the interns assigned to the laboratory measured the initial dissolved oxygen in all the bottles and placed these into an incubator. Five days later he took the bottles out and measured the final dissolved oxygen. Much to his surprise and consternation, the final dissolved oxygen numbers were **higher** than the initial dissolved oxygen values. Suspecting chemical error, he remixed all the chemicals very carefully, following exactly the procedures in *Standard Methods*. But the results did not change. The final DO values were still higher than the initial DO values, and many bottles were actually supersaturated with oxygen.

Swallowing his pride, he finally asked for help. The director himself, being a genuinely nice guy and a good mentor, decided to lend a hand. He carefully mixed the chemicals and ran the Winkler test, but with the same results.

After eliminating all possibilities that would explain the anomalous result, the intern looked into the incubator. When he opened the door, a light came on. But when he depressed the switch in the door that was supposed to turn off the light, the light remained illuminated! With the door closed, it was impossible to know that the light had stayed on during the five days of incubation and provided the energy for the algae in the bottles to produce oxygen. He removed the light bulb and the project continued, with one very smug intern who would go on to tell this story to students every time he taught the concept of BOD.

Often the most obvious solution to problems is right in front of us and we don't see it because we are fooled into believing unwarranted assumptions. Of course the incubator light went out as we closed the door, didn't it? The same is true in the search of drinking water for our communities. Most times engineers have several alternatives to choose from, such as media filtration, membrane filtration, carbon adsorption, and so on. Unfortunately, many engineers in the United States do not even consider one practical and realistic alternative – riverbank filtration.

Riverbank filtration is the process of dropping extraction wells, often with horizontal collectors, into the sandy deposits along large rivers and withdrawing water that has been filtered through the sand. The water supply, if the river is a large one, is basically unlimited, and the quality of the water, after having traveled through perhaps 100 meters of sand, is excellent. My home town next to the Ohio River in western Pennsylvania used riverbank filtration, and the drinking water was so inexpensive that the town did not even bother installing water meters.

The book by Ray, Melin, and Linsky is a compilation of various contributions on the general topic, but it differs from most anthologies in that the papers all hang together. The editing has been excellent and the chapters easily and comfortably follow logically from each other. The first chapter introduces the history and development of riverbank filtration, followed by a chapter on conceptual design of such systems. Two chapters on American experiences and German experiences with riverbank filtration follow. It is interesting that the Germans have made much wider use of this technology, with the Rhine River alone having about 33 riverbank filtration waterworks. The construction of the Louisville, Kentucky plant is described next, followed by a chapter on operation and maintenance considerations. The second part of the book concentrates on contaminant removal, with a concentration on pathogen removal, but also a good discussion on pesticides and pharmaceuticals. An interesting chapter looks at the use of riverbank filtration as a pretreatment for nanofiltration, a marriage that seems to be made in heaven, since the nanofiltration technology requires very clean water as influent. The final section of the book is on research needs, and given the potential for this technology, it

certainly seems prudent to take these recommendations seriously as part of our research agenda.

Riverbank filtration opportunities, like malfunctioning light switches in incubators, are so obvious that often we don't bother thinking about them. This book should go a long way in re-introducing a useful and practical method for providing water to our citizens.

Chittaranjan Ray is with the Department of Civil Engineering at the University of Hawaii at Manoa; Gina Melin and Ronald Linsky are both with the National Water Research Institute in Fountain Valley, California.

— P. Aarne Vesilind

Disinfection Byproducts in Drinking Water: Formation, Analysis and Control

Yuefeng R. Xie, Lewis Publishers/CRC Press, Boca Raton, Florida, 2004

What are the worst jobs in the world? Here is one candidate: How about the people who write and produce cigarette advertising? "Hey guys! Be cool and smoke (and die of emphysema)." But classifying this job as bad requires that the participants share our moral values, which apparently is not the case. Those who promote cigarettes obviously cannot think about what they are doing, or they would not be doing it. It is not like their lives or the lives of their families depend on their jobs. I have a great deal more sympathy for the poor tobacco farmer in eastern North Carolina who believes that if he did not grow tobacco his family would suffer, and given their economic conditions, this is not far from the truth. But the advertisers–those smart, articulate, talented folks in New York who think up new ways of causing people to be addicted to cigarettes–those people have to be moral cripples.

But then there are worse jobs that are simply terrible because of what they entail. One such job, during the Victorian era in London, was being a "tosh."

The sewers in London and larger continental cities during the 19th century were mostly large egg-shaped channels that were large enough to allow people to walk through them. The great battle between these large sewers, advocated by the engineers, and the small-diameter sewers proposed by Edwin Chadwick, was still raging. The infamous sewers of Paris, celebrated in many 19th century novels, were an engineering marvel.

With sewers of that size, if one did not mind sloshing around in sewage, it was possible for people to walk around inside and some sought them out as both hiding places and shelters from cold. These people discovered that the sewers flowing through wealthy neighborhoods carried not only waste, but also occasional valuables that had been inadvertently flushed down the WCs. This led to a new form of income for the destitute–sieving the wastewater flowing in the sewers in the hopes of finding money or other valuables, and these people became known as "toshes." The toshes have my vote for doing one of the worst jobs ever.

Finding money in waste is not so far-fetched, however, even in modern times. In the 1970s, during the era of the EPA solid

waste recycling demonstration plants, one of the facilities was the Black Clawson processing plant in Franklin, Ohio. The process was wet pulping the refuse, followed by sieves and other separation steps. The workers at the plant reported that on average they were recovering 15 cents in coins per ton of refuse processed. It was funny because the plant only processed a few tons per day and so the money was insignificant. But consider what this would mean for a city like New York. Assuming 8 million people, each person contributing one ton a year, for a total of 8 million tons per year–that would mean $1,200,000 per year of lost money! Maybe this knowledge would make New Yorkers stop dumping all their trash in Pennsylvania.

So something bad like refuse, or sewage, can contain something very worthwhile, like money. And of course the reverse is true as well. Some things that are basically good and worthwhile can have undesirable detrimental effects. Such is the case with unwanted products of disinfection.

Yuefeng Xie has published what I believe is the first useful book for student or workshop use on disinfection byproducts. It is written totally by the author and is not a compilation of articles such as Phil Singer's definitive volume on disinfection

byproducts (*Formation and Control of Disinfection By-Products in Drinking Water,* AWWA 1999).

The first chapter starts (appropriately enough) at the beginning, explaining what the disinfection byproducts are and where they come from. The level of presentation is easily understandable for students and water treatment plant operators. Chapters on the stability of the byproducts and the effect of treatment processes on the formation of these byproducts follow. A fine chapter on disinfection byproduct control introduces all the options we presently employ in reducing the level of these unwanted chemicals. Another good chapter covers inorganic disinfection byproducts, chemicals often forgotten in the enthusiasm for removing trichloromethanes. A chapter on disinfection byproduct regulations is excellent, and this is followed by a chapter on information resources–all invaluable stuff for workshops and training programs for water treatment plant operators.

The last chapter is an overview of drinking water treatment processes. This is a curious, and in my view, somewhat condescending chapter. I am not sure why it is here and what purpose it serves. The people who would want to know about the formation and control of disinfection byproducts would all be quite familiar with the material in this chapter. But its presence does not detract from the overall excellence of the book. It is a fine effort and highly recommended to anyone working in disinfection. Producing undesirable and often unpredictable bad things from actions that are basically good and useful is just normal engineering, just as having some good things come from doing jobs that are basically awful.

Yuefeng F. Xie is an Associate Professor of Environmental Engineering at Penn State Harrisburg.

— P. Aarne Vesilind

Greenwash: The Reality Behind Corporate Environmentalism

Jed Greer and Kenny Bruno, The Apex Press, New York, 1996

Most of us in the civil/environmental engineering field only have indirect contacts with transnational corporations (TNCs), such as when we buy gasoline for our cars, eat fruit sprayed with pesticides, or so on. We see their self-congratulatory ads on television and in newspapers suggesting that these corporate behemoths are serving the public good and we are lulled into complacency. Then alongΔC comes a book like *Greenwash*, and we are shocked back into reality. If Greer and Bruno are right, these corporations have done some truly evil things and have produced more misery, destruction, and death than all our wars combined.

But is such a blanket indictment fair? Are these corporations really to blame, or are we whipping the wrong mule?

In order to find an answer to this question, we can use an analogy. In any operation within an engineered or natural system, there is some driving force that makes it go. For example, in gas transfer the driving force is the difference in concentrations of a particular gas on either side of an interface. We express the rate of this transfer mathematically as

$$\frac{dM}{dt} = k(\Delta C)$$

where M is mass, t is time, k is a proportionality constant, and ΔC the difference in concentrations on either side of the interface. The rate at which the gas moves across the interface is thus directly proportional to the differences in concentration. If ΔC approaches zero, the rate drops until no net transfer occurs. The driving force is therefore ΔC, the difference in concentrations.

Human actions might similarly be described and understood by first recognizing the driving force. For example, if ample food is presented to a very hungry person, the rate at which this person will consume the food is directly proportional to the hunger. At first, the hungry person will eat with gusto, but as the hunger diminishes, the rate is reduced. The driving force is hunger, and as this approaches zero, the reaction (eating) stops.

Abraham Maslow is one of many psychologists who have been trying to understand human motivation, that is, the human driving force. He recognized that humans have some basic needs that would propel them to act in order to fulfill certain needs. The physiological needs such as hunger, thirst, bodily comforts, and so on must be met first before people can begin to meet other needs such as safety, belongingness (love), and esteem. Maslow then proposed that once these needs are met, people can act on fulfilling growth needs such as the need to know and understand, the need for aesthetic beauty, and finally for what he called "self-actualization." People who are driven by such motives to achieve self-actualization are problem focused, incorporate an appreciation of life, are concerned with personal growth, and are able to have peak experiences.

Our purpose here is to try to understand the driving force that promotes business managers to do what they do. And this is not difficult. The driving force is profit, and the power that comes from profit. If this is true, then any of the green engineering operations or the moves toward sustainability so widely touted by many corporations must be driven by profit motives, and the primary reason businesses participate in sustainability programs is because it is good for business.

The leaders of eight leading firms that adopted an environmentally proactive stance on sustainability were asked in one

study to justify the firms' adoption of such a strategy. All companies reported that they were motivated first by regulations such as the control of air emissions, pretreatment of wastewater, and the disposal of hazardous materials. One engineer in the study admitted that: "The [waste disposal] requirements became so onerous that many firms recognized the benefits of altering their production processes to generate less waste."

The second motivator identified in this study was competitive advantage. One director of a microprocessor company noted that "by reducing pollution, we can cut costs and improve our operating efficiencies." The company recognized the advantage of cutting costs by reducing its hazardous waste stream.

A PriceWaterhouseCoopers study in 2002 confirmed their findings. When companies were asked to self-report on their stance on sustainable principles, the top two reasons for adopting sustainable development were found to be 1. Enhanced reputation (90%), and 2. Competitive advantage (cost savings) (75%). It is not clear if the respondents were given the option of responding that they practiced sustainable operations because this was mandated by law. If it had, there is no doubt that all companies would have publicly stated that they are, indeed, law abiding.

Where there is ample evidence for massive greenwashing by corporations, Greer and Bruno in their book go over the top, as you might expect from two former Greenpeace activists. Nevertheless, they do provide ample documentation and interesting insights into activities of the transnational corporations, including such familiar names as Dow Chemical, Rhone-Poulenc, ALCOA, International Paper Company, and Browning-Ferris. Even if you are skeptical of the authors for starting out with a biased view, the book is a strong indictment of environmentally destructive corporate behavior while ballyhooing their commitment to the environment.

But we cannot blame the corporations. They are driven by profit. If you get mad, get mad at a system of weak governmental control and increased concentrations of economic power, and not at the companies. The companies are doing what they were designed to do – make money.

Jed Greer and Kenny Bruno, at the time they wrote the book, were both members of Greenpeace. Their present affiliations are not known.

— P. Aarne Vesilind

Coal: A Human History

Barbara Freese, Penguin Books, London, 2003

Those of you who have suffered through my book reviews know that I like to start a review with a joke or a mildly entertaining story. I cannot do that with this book. This is not a book that warrants levity. This is a serious book that will change the way you think about air pollution, technology, capitalism, and our way of life.

Barbara Freese is a historian, lawyer, and activist who served as assistant attorney general of Minnesota. In that job she began to integrate the immense effect the mining and burning of coal has had on our civilization and decided to understand this from the perspective of human history. The result is a fascinating book that is a must read for anyone teaching air pollution technology or policy.

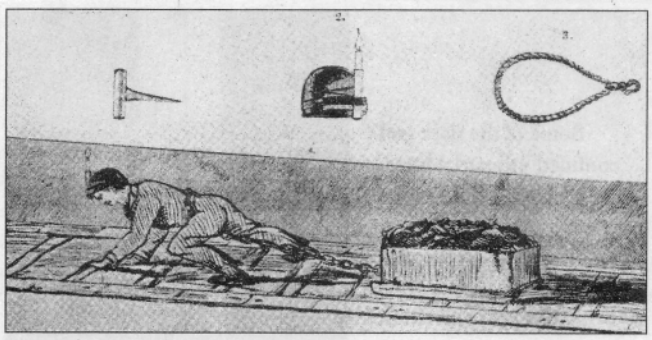


Illustration from an 1840 British government report on child labor, showing how children were forced to crawl through narrow mine tunnels hauling coal.

Freese begins the story in England during the 1300s where the major fuel was wood. As the forests of England were cut down, the need for another fuel source became critical. Sea coal, or outcroppings along the coast, was discovered, and people soon learned to burn it as a wood substitute. Up until that time coal was a curiosity and was often used as a semi-precious stone in the making of jewelry. The wide use of coal in London and other English cities made possible the Industrial Revolution, and the subsequent exploitation of entire generations of British citizens. Most devastating was the use of child labor. Freese describes this in factual yet passionate terms. An excerpt:

> "The growing demand for coal prompted operators to expand their mines by following narrower coal seams, but because the new tunnels were often too low for horses or adults to pass through, children were used to haul the coal. The commission [Ed: one of many investigative commissions that was supposed to lead to regulations but in fact had little effect on the industry] described the childrens' plight this way: 'Chained, belted, harnessed like dogs in a go-cart, black, saturated with wet, and more than half naked — crawling upon their hands and feet, and dragging their heavy

loads behind them — they presented an appearance indescribably disgusting and unnatural.' The cruel treatment of children in the mines may have made it easier to tolerate their comparatively milder but more widespread exploitation in the coal fueled factories."

What caused such behavior on the part of the coal mine operators? On a macro level, it was the confluence of three powerful forces – capitalism, technology, and defense. Capitalism, which counts success only on the basis of profit (witness the Donald Trump embarrassment on television); technology, which made possible the mining of coal at great depths after the invention of the Newcomen engine and water pump; and defense, which in England led to the formation of the mightiest navy on earth, fueled by coal. On a micro scale, the exploitation of children was simply greed.

Freese's book shows how the three forces of capitalism, technology, and defense have to be controlled by the recognition that human dignity and human happiness are equally important objectives. It is our apathy and lack of willpower that allows these three monsters of greed to subjugate humanity. Regulation of air pollution, a topic that is of keen interest to AEESP members, is discussed within the perspective of the power of capitalism to circumvent any such controls.

Even though we now have strong air pollution and child labor laws, this fight is not over. The powers of capitalism, defense, and technology will continue to absorb increasingly greater human capital unless we can slice through this monolith of power by using governmental regulation and moral suasion. In the 19th century, people were subjugated by coal interests, but today our fight is with another fossil fuel industry and with the secrecy of powerful governmental energy policies.

Freese's last chapter is the most troubling because it describes the economic and political situation in contemporary China. What emerges from her first-person research is the conclusion that the Chinese have not learned anything from the West. Coal is the life-fuel there today as it was here a hundred years ago and they are making the same mistakes of air pollution, exploitation, and narrow interests as we did during our industrial revolution.

This is a wonderful book, full of stories, anecdotes, and background material for understanding the history of air pollution. This book is all about people, and smoke, and prosperity, and wealth. It is all about coal. This is a book you must buy and read.

Barbara Freese is now a free-lance writer living in St. Paul, Minnesota.

— P. Aarne Vesilind

The Bucknell Tuba Quartet (left to right), Aarne Vesilind, Chris Styers, Jon Rabin, and Phil Wetzel

Aarne Vesilind

Call for Papers/Posters

American Water Works Association 2005 Source Water Protection Symposium

January 23-26, 2005
Palm Beach, Florida

Deadline for abstract submission: May 17, 2004

You are invited to submit abstracts for the 2005 Source Water Protection Symposium. The symposium program will be developed from a combination of submitted papers/posters and invited speakers. To have your abstract considered for presentation at the 2005 Source Water Protection Symposium, submit the abstract and author information form. Instructions are provided below.

The Symposium will include topic areas relating to transitioning from assessment to protection, development of effective source water protection strategies, partnership building, inter-jurisdictional issues, southeastern US source water protection issues, emerging issues, international perspectives, and other timely source water protection topics.

To have your abstract considered, submit your abstract using the Abstract and Author Information Form (obtained through the AWWA website). Please complete the information requested on the abstract submission form. A separate form must be provided for each individual abstract. If an abstract is submitted online, it is not necessary to mail or fax a duplicate submission. Abstracts are limited to one typed, single-spaced page.

A workbook will be included in the full conference registration fee and will be available at the conference. All authors selected for this symposium must agree to submit a manuscript in the electronic format (e.g., MS Word or Adobe Acrobat PDF) to AWWA by November 15, 2004.

If you have questions you may contact Chi Ho Sham, Chair of the Planning Committee, via e-mail at csham@cadmusgroup.com.

Call for Titles/Interest

Free Radical Chemistry in the Environment PACIFICHEM 2005

December 15-20, 2005
Honolulu, Hawaii

http://www.pacifichem.org/symposia/

The focus of this symposium will be on different aspects of free radical chemisty as they apply to environmental processes, environmental technology, and green chemistry. Various environmental processes occur via free radically mediated reactions including aquatic photochemistry, atmospheric chemistry, advanced oxidation processes, and emerging aspects of polymer chemistry (green aspects). Technical sessions will focus on different topics of free radical chemistry providing an overview of the areas of interest. Poster sessions will be used extensively to fill out the topical areas. Wiley will publish an edited book(s) based on papers presented at this symposium.

Technical Sessions: Advanced Oxidation Processes; Atmospheric Chemistry (computational and experimental); Aquatic Photochemistry; Polymer Chemistry; Computational Chemistry.

Symposium Planning: Please send titles and authors of potential presentations electronically to William J. Cooper; cooperw@uncw.edu. The submission of tentative titles and authors will be very helpful in obtaining funding for the Symposium. Where possible indicate student participation.

Organizers: William J. Cooper, Professor, Department of Chemistry, University of North Carolina at Wilmington, 601 S. College Road, Wilmington, NC 28403, Tel: 910-962-2387; T. David Waite, Director, Centre for Water and Waste Technology, School of Civil and Environmental Engineering, University of New South Wales, Sydney, NSW 2052, Australia; Barrie M. Peake, Senior Lecturer in Environmental Chemistry, Chemistry Department, University of Otago, P.O. Box 56, Dunedin, New Zealand.

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