

Badger chemist : the newsletter of the University of Wisconsin-Madison Chemistry Department. No. 42 1998

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Badger Chemist

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Issue for
1998

No.
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THE NEWSLETTER OF
THE UNIVERSITY OF WISCONSIN-MADISON

CHEMISTRY DEPARTMENT

CONTENTS

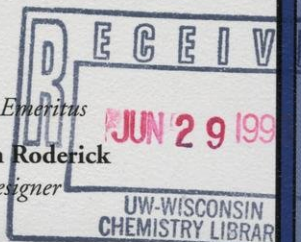
From the Chair	1
Current Chemistry News	2
Other Notable News	6
Education Activities	10
Community Commitment	13
The Overview	16
Library News	17
Building Addition & Renovation ..	18
This 'N' That	19
New Badger Chemists	22
Donors to Chemistry Fund	24
Our Awards	26
Harlan Goering	27
In Memoriam	28

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Art Director

Kristen Roderick
Designer





UNIVERSITY OF
WISCONSIN
M A D I S O N

Summer 1998

Dear Badger Chemists:

As I reflect on this second issue of the *Badger Chemist* for which I have served as editor, I look back at the previous year with a sense of how much has happened in the Department. Achievements of members of the Department – awards, milestones, faculty activities, special events, and so on – are detailed in the pages of the *Chemist*. I hope that everyone can find some news about people that you knew at Wisconsin.

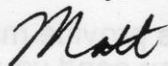
I have especially enjoyed communicating with you about your contributions to the “This ‘N That” section, where you get a chance to tell your former colleagues what you have been up to. Continue to send these notes about activities. I enjoy hearing from my classmates, and I want this section to provide a glimpse into the many paths that we have taken in our lives and careers.

Not all of our news is pleasant. The death of *emeritus* professor Harlan Goering in an accident came as a shock to all who knew him. His contributions to the life of the Department were substantial, and he will be missed, as will all of our alumni and friends who have died in the past years. A summer undergraduate research scholarship has been set up in the name of Ed Panek, who died last year. (See the text for details on how to contribute.)

The Department is indebted to the generous support of friends and alumni for making many opportunities, such as scholarships, possible for our students. This edition of the *Badger Chemist* lists the previous year’s donors to Chemistry Funds. Our thanks to all of you who have established or contributed to any of these funds. As in the past, a list of UW Foundation Chemistry funds is given on the back of this letter.

Remember to visit our web site at <http://www.chem.wisc.edu> to read the weekly newsletter and, after it is begun at the end of summer, to look at images of the new building in progress.

Sincerely,



Matt Sanders
Executive Director and BC #42 Editor

UW FOUNDATION ACCOUNTS FOR THE DEPARTMENT OF CHEMISTRY

FUND NAME	FUND NUMBER	DESCRIPTION
Department of Chemistry Fund	1222137	Supports research and teaching activities in the Department
Chemistry Building Fund	12221293	Will Support the Construction of the New Chemistry Building Addition
Badger Chemist Fund	1222534	Provides funds to publish the Badger Chemist
Farrington Daniels Memorial Fund	1222324	Funds special projects relating to the benefits of science to society
Fund for Graduate Women in Math & Chemistry	12540909	Assists Women Graduate Students in Math and/or Chemistry
Hirschfelder Visitors Fund	12220912	Supports Visits to the Theoretical Chemistry Institute by Outstanding Scholars
Inorganic Chemistry Seminar Fund	12221344	Supports the Inorganic Division Seminar Programs
Institute for Chemical Education Fund	1222929	Supports Activities in Chemical Education
McElvain Seminar Fund	12220241	Income supports the ongoing seminar series organized and run by the graduate students in the Department of Chemistry
Project SERAPHIM	12220404	Supports Activities in Chemical Education
Shakhashiri Science Education Fund	12221133	Supports Activities in Science Education under the direction of Prof. Bassam Shakhashiri
Lectureships/Professorships		
J. O. Hirschfelder Fund	12220310	Provides research funds for use by the Hirschfelder Professor of Theoretical Chemistry; also supports activities of TCI
V. W. Meloche Lectureship	1222825	Funds a special seminar series in Analytical Chemistry
John E. Willard Lectureship	1222829	Funds a special seminar in Physical Chemistry

FYI: Gifts to the UW Foundation are tax deductible, and many companies provide matching contributions allowing you to multiply the value of your gift. When you send your donations to the UW, you can specify that your gift go to Chemistry and further specify any of the above named funds.

Address gifts/correspondence to the **Chair, Department of Chemistry, University of Wisconsin, 1101 University Ave., Madison, WI 53706** or to the **UW Foundation, 1848 University Ave., Madison, WI 53708**

World-Wide Web Page for
University of Wisconsin-Madison Department of Chemistry Alumni

We continue to update the Chemistry World-Wide Web page, <http://www.chem.wisc.edu>. Our "Alumni" section includes information on our BS, MS, and PhD alumni and what they are doing. If you'd like to be listed in our alumni section or to update your information, please complete this form and return it to the address below. Thanks!

Your Name: _____

Degree and Year of graduation: _____

Research Advisor: _____

Current Employer (position and company/school/lab): _____

If you and/or your company have a web page that you would like us to link to, please include the complete www address (URL) below:

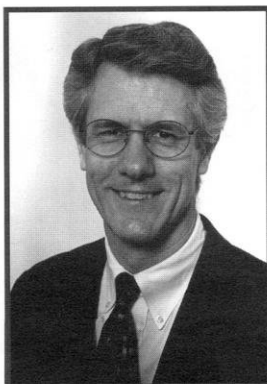
If there is any additional information (personal or professional) about you or your activities that you'd like us to include on the web page, please include below or on a separate sheet. We are also happy to include photographs if you supply them.

If your Badger Chemist mailing label is not correct or your address has changed (or will change), please include your new address here or e-mail it to wegner@chem.wisc.edu

Please return this form to:

Matt Sanders, Department of Chemistry, University of Wisconsin, 1101 University Avenue,
Madison, WI 53706-1396 (or e-mail MSANDERS@CHEM.WISC.EDU)

FROM THE CHAIR



The Department continues to flourish and change as we face many opportunities. The changes most on our collective mind right now are physical space, as we approach the start of our building addition and renovation project, and the intellectual landscape, as we begin renewing ourselves with young faculty.

The building addition and renovation project has passed a crucial milestone. In April, the drawings for the full project went out for bids. We will know in the summer, when we learn the actual cost, how many of our dreams we will realize. We expect construction to begin in the fall and are looking forward to a ground breaking celebration that we hope many of our alumni will attend. The State, the University, the College of Letters and Science, the Vilas Foundation, the National Science Foundation, the National Institutes of Health, the Dow Chemical Co., and alumni and friends of the Department have all pledged crucial financial support that has made the project go forward. The next four years promise to be exciting and disruptive as we build a 40,000 sq. ft. addition and renovate about 90,000 sq. ft. of existing space while operating the Department at full speed.

Bringing new faculty into our Department is also a central focus. This year we interviewed for junior faculty in any area of chemistry and expect to do so for many years to come. We are beginning the process of renewing the intellectual capital of the Department as many of our senior colleagues retire in the coming years. The energy that young faculty bring to a Department is exciting and complements the established excellence of the current faculty. We see bright and interesting times as we add colleagues working in new and traditional areas of chemistry.

This issue of the *Badger Chemist* brings you detailed information about the building, faculty activities, and many other aspects of the Department. It also provides me a chance to thank colleagues, friends, and alumni for their support during the three years I have chaired the Department. The end of my term allows me to return eagerly to full-time research and teaching. Our new chair, Chuck Casey, a distinguished chemist who many of you know, will greet you from these pages next year.

You can visit our website at www.chem.wisc.edu to get the latest information, including the *Badger Chemist* and the *Department of Chemistry Newsletter* on line. We look forward to hearing from you with your comments, suggestions, and questions.

Fleming Crim

email address: fcrim@chem.wisc.edu



CURRENT CHEMISTRY NEWS



Departures

Fred Juergens, our lecture demonstrator for 20 years, retired in December 1997. He will spend part of his retirement sailing across the Atlantic on a small sailboat and part relaxing in the sun in warmer climes. However, he also expects to work with the general chemistry teaching program each fall for the next few years, doing discussion/lab sections. Fred's retirement party in December drew most of the faculty and staff to wish him well. His replacement is **Kristin Johnson**, who brings to the position experience in biochemistry and who is working into the position cheerfully and effectively.

Bob Lavine retired in summer 1997 after 30 years of service to the Department as Lab Director and Timetable and Rooms Coordinator. Bob says he has enjoyed his time here almost from the moment **Irv Shain** picked him up at the airport for his interview. Bob figures he has dealt with about 100 instructors, hundreds of TAs and thousands of students during that time. Bob has returned to the Department to help out with shortages in the Analytical lab staff this semester, but is looking forward to really being retired and spending more time with his grandchildren.

Arrivals

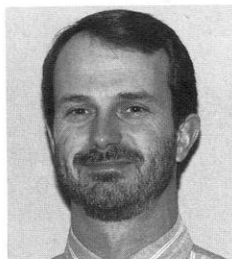


Kristin Johnson joined the Department in September as a successor to **Fred Juergens** in the Lecture Demonstrations Lab. She

worked with Fred during the Fall and took over the Lab after Fred's retirement in December. Kristin got her PhD from Vanderbilt. Among her other experiences, Kristin spent 2 years in the Peace Corps in Belize.

Tom Stringfellow arrived at the Department in January to take a job as Assistant Director of the NMR Facility in the Chemistry Instrumentation Center.

Tom will be taking some of the duties from **Charlie Fry**, the Director of the Facility. Tom will teach the introductory Chem 626 course and Charlie will teach the advanced section. Tom was a graduate student in the Department under **Tom Farrar**, receiving his PhD in 1996. He spent a year as a Killam Postdoctoral Fellow at Dalhousie University in Halifax, Nova Scotia, and came back to the Department as a Faculty Associate in September.



Faculty and Staff News

Larry Dahl presented three lectures at Texas A&M in December 1996 as the Inorganic speaker at the "Frontiers in Chemical Research Program." In December '97 he traveled to Bristol, England, to give the 7th Gordon Stone Lecture. He also gave invited talks in 1997 at MIT, University of North Carolina, North Carolina State University and Wake Forest, and at Arizona State University in

March '98. In February '98 he participated in a symposium at the University of Georgia honoring the 60th birthday of Bruce King. In the fall of '97 Larry spent a long weekend in Las Vegas with Dick and Fran Fenske; one highlight of his most enjoyable visit was his impromptu singing duet of "Love is Funny or It's Sad" with Debbie Reynolds during an evening at her casino show.

Mark Ediger traveled to Vigo, Spain to give a talk at the Third International Discussion Meeting on Relaxation in Complex Systems. (The meeting was not relaxing but very stimulating, and the food was great!) He also spent a week masquerading as a physicist at a workshop on Jamming and Rheology at the Institute for Theoretical Physics. Other invited talks included Stanford University and the American Physical Society National Meeting.

Art Ellis had a busy year as chair of the Inorganic Chemistry Division. He presented the Chute Lecture at Dalhousie University. Art will be serving on the ACS Committee on Science in 1998, and on the UW-Madison Re-Accreditation Steering Committee.

The May/June 1997 issue of *Rheologica Acta* was dedicated to **John D. Ferry**, on the occasion of his 85th birthday in May. A *Laudatio* was written by **John Schrag** and **Robert Landel** (PhD '54, Ferry). The issue included articles written by **Mark Ediger**, **Tim Lodge** (PhD '81, Schrag), **Kunihiro Osaki** (PD, Ferry), **Norio Nemoto** (PD, Ferry), **Paul Janmey** (PhD '82, Ferry), **R.B. Bird** (PhD '50, Hirschfelder), **Chuck Curtiss** (PhD '48,



Hirschfelder), **Ole Hassager** (PhD '73, Bird), **Nick Tschoege** (Visiting Scientist, Ferry), **Don Plazek** (PhD '57, Ferry), and **Henning Winter** (PD, Bird).

Sam Gellman and **Laura Kiessling** were identified as "rising stars" in life sciences at the UW in an article in the Dec. 7, 1997, *Wisconsin State Journal*. Former chemistry professors **Joseph Hirschfelder** and **John Willard** were cited as stars in the physical sciences.

Bob Hamers made several trips overseas during the last year. In March he was an invited speaker at the International Conference on Microscopy of Semiconductors, held in Oxford, England. In July Bob gave an invited talk at the First International Conference on Tunneling Microscopy in Poznan, Poland, and then went to the International Conference on Scanning Tunneling Microscopy in Hamburg, Germany. In September Bob gave the plenary talk at the 17th European Conference on Surface Science (ECOSS-17) in Enschede, The Netherlands.

Learning via the Web: In addition to his volunteer duties as webmaster for the chemistry department webserver, Bob Hamers has also been active developing new materials for learning chemistry via the worldwide web. The first product, known as the "Virtual Titrator", is a web-based java tool for teaching about acid-base chemistry. Using their favorite java-enabled web browser, students can input known physical constants such as dissociation constants and concentrations for various complex acids and bases, and the Virtual Titrator will numerically solve the equilibrium equations and present the results in graphic form. The Virtual Titrator also calculates speciation curves ("alpha plots") and can include activity coefficients. The Virtual Titrator is now being used by faculty here at UW, but has already generated response from people as far away as Chile! To take the Virtual Titrator for a test drive, point your favorite java-enabled web browser to: <http://www.chem.wisc.edu/~virtualtitrator>.

John Moore continued an active travel schedule in 1997, attending both national ACS Meetings. San Francisco in the Spring

was particularly active because he presented three papers and a poster paper, and organized a symposium. The symposium was "Press On Regardless: J. J. L. and the Journal of Chemical Education", honoring J. J. Lagowski upon his retirement as editor. His talk in this symposium was an overview of the instructional use of computing since 1965, titled "Instructional Computing from J. to J. to L." The other talks were "The Journal of Chemical Education: What's in It for High School Teachers", presented at High School Day, and "ConcepTests in a Large Lecture Class." The poster paper described the New Traditions curriculum project: "Establishing New Traditions: Revitalizing the

member of the executive committee of the Division of Chemical Education.

John gave two talks in May at ACS Local Sections in Wisconsin-Stevens Point "Can Virtual Reality Have Real Virtue? Using Electronic Media Effectively" and Milwaukee (The Journal of Chemical Education and the Future of Chemical Education). In August he participated in the ChemEd '97 Biennial Conference held in Minneapolis, talking about "The Journal of Chemical Education: What's in It for High School Teachers".

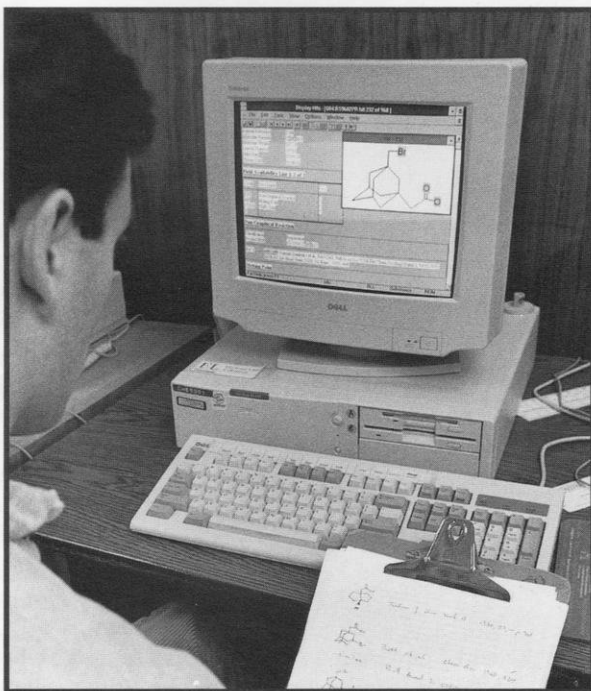
In September there were back-to-back visits to Calvin College in Grand Rapids and Hope College in Holland, Michigan, where he presented the lecture "Can Virtual Reality Have Real Virtue? Using Electronic Media Effectively". At Calvin College he met with **Roger DeKock** (PhD '70, Fenske) and **Mark Muyskens** (PhD '89, Crim); at Hope his host was **Nicole Bennett** (PhD '97, Vedejs).

In early November he traveled to ACS Headquarters in Washington, DC for an ACS Satellite TV Seminar on curriculum reform and gave a progress report on curriculum reform efforts titled, "Establishing New Traditions: Revitalizing the Curriculum."

Locally he made presentations at four meetings and workshops organized by the New Traditions Project.

During 1997 John completed the revision of the second edition of the major general chemistry text, *The Chemical World: Concepts and Applications*, published by Saunders College Publishing Co. This text integrates organic chemistry, biochemistry, environmental chemistry, and industrial chemistry topics into a mainstream course for science majors. It also embodies the philosophy of the New Traditions curriculum project and is a major step towards a more student-centered approach to general chemistry.

In addition, John writes an editorial each month for the *Journal of Chemical Education*, he was a co-author of two major JCE Software publications on CD-ROM: "Chemistry Comes Alive, Volume 1" and "Periodic Table Live", and he wrote an invited paper, "Revitalizing Science Education", that appeared in the January



Curriculum." At the close of the ACS Meeting all of the NSF Systemic Projects held a meeting in nearby Menlo Park, where he presented the activities of the New Traditions project.

At the Fall meeting in Las Vegas he was author of two papers - one about ICE Devices at High School Day and the other about the New Traditions curriculum project at a symposium on NSF Systemic Curriculum Project. Otherwise he divided his time between technical-paper sessions and Meet the Editor sessions at the Journal's booth. At both meetings he continued to participate in ACS governance-as a consultant to the ACS Society Committee on Education and as a



SCIENCE IS FUN ON CAPITOL HILL



During one of his many frequent visits to the Nations' Capital to promote science literacy with members of Congress, Senators, and the Administration, Professor **Bassam Z. Shakhshiri** engages Presidential Science Advisor Jack Gibbons in a hands-on experiment involving the alkaline air-oxidation of dextrose in the presence of indigo carmine.

1997 issue of *The World and I*, a magazine published by the *Washington Times*.

Dan Rich gave lectures at the Keystone Symposium on Novel Therapeutics, in Durango, CO; at a special Symposium held in honor of the late W.S. Johnson, at the San Francisco ACS meeting and at the ACS Ralph Hirschmann Award Symposium, also in San Francisco. He was a plenary lecturer at the First Italian-Swiss Medicinal Chemistry Symposium, in Turin, Italy, and at the First International Conference on Protease Inhibitors in Kyoto, Japan. In June he was an invited participant at the Biogen 20th Anniversary Symposium, held in Munich, Germany. In February of this year, he and Barbara Imperiali co-

chaired the Gordon Research Conference on Peptides in Ventura CA, where **Sam Gellman** also spoke.

John Schrag gave an invited lecture at the 3rd International Discussion on Relaxations in Complex Systems, June 30 to July 11, in Vigo, Spain.

Bassam Shakhshiri was appointed in April to the Editorial Advisory Board of the *Scientist* newspaper. According to Publisher and Editor-in-Chief Eugene Garfield, "Dr. Shakhshiri's strong national leadership in science and science education will aid and improve our editorial content." *Once Upon a Christmas Cheery in The Lab of Shakhshiri* is Bassam's annual Holiday Lecture, in which he shares the joy and excitement of science with the general public. As in

previous years, the 28th annual program was presented four times last December in Madison and telecast across the country on PBS. In addition to Bucky Badger and Santa Claus, who always join Bassam for the festivities, Madison Mayor **Sue Bauman** (BS '65), appeared as a special guest, and she joined Bassam in presenting the iodine clock reaction and preparing large silver ornaments. The 1997 program as broadcast on PBS is available on videocassette for \$30.00; these cassettes make excellent gifts to local schools and teachers. More *Science Is Fun* activities can be found on the World Wide Web at <http://scifun.chem.wisc.edu>. This Web site offers a wide array of information, including science experiments to do at home, topics discussed during Bassam's monthly appearances on Wisconsin Public Radio, and the colorful *Chemical of the Week* Series, which describes chemicals of special interest in the economy, in the environment, or in the news. Also available at the Web site are details about the videocassettes of the 1997 Holiday Lecture. This Web site is designed and maintained by Bassam's long-time collaborator **Rodney Schreiner** (MS '73, PhD '81), who is the principal co-author of the four volume series *Chemical Demonstrations: A Handbook for Teachers of Chemistry*, published by the University of Wisconsin Press. Last spring, Rod took the *Science Is Fun* program to the Disney EPCOT Center in Orlando, Florida, where he presented thirty shows to large audiences and has already been invited for a return engagement.

During this past year **Jim Skinner** gave a number of lectures, both abroad (Germany, Austria, Czech Republic, UK) and here, including the Gerhard Closs Lecture at the University of Chicago, and the Graduate Student Invited Lecture at the University of California Berkeley. Jim was elected Fellow of the APS, and co-Chair of the 2003 Gordon Conference on "Molecular Electronic Spectroscopy and Dynamics".

Jim Taylor summarized his efforts recently. In teaching, he has been instrumental in the formation and guidance of the UW Teaching Academy, the American Association for Higher



Education Peer Review Project, the UW System Undergraduate Teaching Improvement Council, the UW-Madison LEAD Center, and other national and campus activities that enhance teaching and learning on the UW-Madison campus. The Peer Review of Teaching Project involved 12 different universities across the country to examine the potential improvements that could arise from applying some of the peer review research techniques to the teaching arena. One of the things that makes him feel that some of the effort with the Teaching Academy has been worthwhile is the recognition that the Carnegie Foundation For Teaching provided our campus when they proposed to the Pew Charitable Trust that Pew fund the creation of 80 Teaching Academies at U.S. campuses using our model as one of the effective and sustaining ones that should be emulated elsewhere. If "imitation is the sincerest form of flattery", this is a good indication that we must have done something correctly in the formation of our Academy. In April of 1997, Jim accepted a position as Executive Director of the Synchrotron Radiation Center, an NSF-funded facility in Stoughton.

Jim Weisshaar spent the 1997-98 academic year on sabbatical with his entire family (and dog) at the University of North Carolina-Chapel Hill. In collaboration with Prof. Ed Samulski, he is exploring new ways to obtain information about conformational preferences of small peptides in solution phase, quite a scientific departure for Jim. The goal is to provide incisive new measurements that critically test the quantitative accuracy of popular model potentials such as CHARMM and AMBER. He plans to develop this new area in parallel with his ongoing research in gas phase spectroscopy and chemical dynamics. Jim recently received a WARF Mid-Career Faculty Researcher Award from the UW-Madison for the period 1998-2003.

In May **Bob West** and eleven of his research group attended the annual North American Organosilicon Symposium in London, Ontario. As has been a tradition in his research group, as many as could crowd into a Cessna flew with Bob. Trav-

eling by less exciting aircraft in 1997, Bob also presented papers at meetings in Japan, Belgium, and the United Kingdom. Currently Bob's group has collaborative research projects with groups in Japan, Germany, Israel, Korea, and Brazil, as well as with researchers in the United States. Bob's 500th scientific paper was published in the November 27 issue of *Organometallics*.

HyukYu was profiled in the May/June 1997 *On Wisconsin* magazine of the Wisconsin Alumni Association. The article by Dan Knapp highlighted Dr. Yu's views of research in the United States and Japan, and described his winning the 1997 Ho-Am Award in Basic Science (see BC #41).

Howard Zimmerman notes that a

number of his students have been sending Christmas greeting and notes, which are included in the "ThisNThat" section of the Badger Chemist. Zimmerman, Prof. **Chris Bender** (PD '67-'69, Zimmerman) of Lethbridge, Canada, Chris's wife Christine, **Andrei Kutateladze** (PD '93-'95, Zimmerman) of Denver University and his wife Tatiana shared a dinner table aboard the banquet cruise of the InterAmerican Photochemistry Society (IAPS) Meeting in Clearwater, Florida. Another Zimmerman postdoc at the Meeting was **Harry Morrison** (PD '63) of Purdue University. Harry is now a Dean at Purdue but keeps his research group active.

FIVE GENERATIONS OF ORGANOSILICON CHEMISTRY



This photo of five generations of organosilicon chemistry researchers was taken at the annual Organosilicon Symposium held in 1997 in London, Ontario. In the center is Eugene Rochow, Emeritus Professor at Harvard University; to the right, his student, UW faculty member **Bob West**; next, Bob's student **Joyce Corey** (PhD '64), now Professor at U. of Missouri-St. Louis; far right, Joyce's student Janet Braddock-Wilking, also on the faculty at UMSL. On the left, Janet's student Yana Levchinsky, as well as Joyce's student Brian Grimmond.



OTHER NOTABLE NEWS



Seventh Hirschfelder Prize in Theoretical Chemistry

The 1997-98 Hirschfelder award was presented in October to Prof. **Ernest R. Davidson** of Indiana University. Dr. Davidson, an NSF Post-doctoral Fellow with Dr. Hirschfelder in 1962, came to Madison to deliver three lectures on quantum chemistry and electron spectroscopies.

Hilldale Lectures - Visit by Yuan Lee

Yuan Lee, 1986 Nobel laureate in Chemistry and current president of the Academia Sinica in Taiwan, visited the Department in October. Dr. Lee presented the second in the 1997 series of Hilldale lectures at the State Historical Society, on "Meeting the Challenges of the 21st Century", and also gave a lecture in the Chemistry Department Colloquium series.

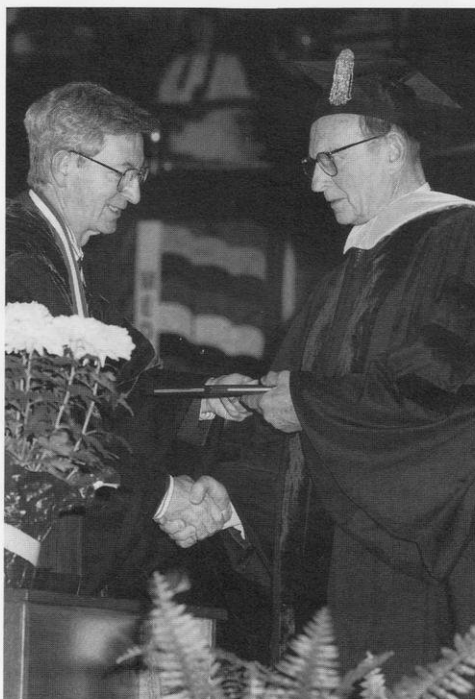
Gilbert Stork Symposium

Gilbert Stork (PhD '45, McElvain), renowned synthetic organic chemist, Emeritus Professor from Columbia University, and winner of the 1996 Wolf Prize, received an honorary degree from the University of Wisconsin at the May 16, 1997 commencement exercises (pictured right). Dr. Stork also delivered an address at a symposium organized in his honor by the Department.

Departmental Colloquium

Chuck Casey chaired the 1997-98 Departmental Colloquium series, which occurred most first Fridays of the month. The first speaker, in October, was Professor **Art Ellis**, who spoke about the current status of chemical sensors. Professor **Yuan Lee** spoke on molecular collisions at the end of October. Professor **George**

Whitesides from Harvard University spoke about self-assembly in November. December's speaker was Professor **Lloyd Smith**, who presented recent advances in DNA electrophoresis. Professor **Sam Gellman** spoke in February about polymer folding in proteins. Professor **Hyuk Yu** spoke in March about the past and future of polymer research. Professor **Steve Burke** spoke about synthesis of difficult molecules in April, and in May Professor **Fleming Crim** talked about energy transfer in small molecules.



Carl Schurz Lectures

In July, Carl Schurz Professor **Dietrich Woermann** from the Institute of Physical Chemistry at the University of Cologne in Cologne, Germany, visited the Department and delivered a series of six lectures on Mass Transport Across Membranes.

The James M. Sprague Lecture series

Professor **Bernd Giese** from the Institute of Organic Chemistry, University of Basel, Switzerland, presented the series of 3 lectures in October. The lectures included "Radical Chemistry with DNA: Electron Transfer and Strand Cleavage Reactions", "Photochemical Cyclizations of Amino Acids in Peptides", and "Mechanism on Enzymatic Synthesis of DNA".

John Walters Named 1997 Minnesota Professor of the Year

Professor **John Walters**, a Chemistry Department faculty member from 1965-1982, was named the Carnegie Foundation 1997 Minnesota Professor of the Year. Dr. Walters moved from Wisconsin to St. Olaf College to allow himself more contact with undergraduates. John's research at Wisconsin centered on the development and characterization of analytical instrumentation, especially arc and spark sources for atomic spectroscopy. After moving to St. Olaf, John developed a teaching method where he combines computers and laboratory role-playing to create student learning experiences in which students flourish. His students have had great success after graduating, especially in the numbers of ACS awards for their PhD research.

McElvain Seminar Series

The Samuel M. McElvain Seminar Series continued for 1997-98 with some prominent industrial and academic scientists visiting the department. This is the 13th year of the seminars, which were originally



funded totally from the Samuel McElvain bequest. The seminar series is organized by graduate students and designed to promote discussions between the visiting scientists and the students. The schedule provides an excellent environment for graduate students to interact with academicians and industrialists in small groups. It is a fantastic chance to meet potential post-doctoral advisors or industrial contacts. Often these visitors share wonderful insights into the future of science and the opportunities available to young scientists. This year's speakers include Dr. Kevin Judice from Advanced Medicine, Professor Barry Trost from Stanford, Dr. William Tumas from Los Alamos National Laboratory, Professor Larry Que of the University of Minnesota, Paul Alivisatos from UC-Berkeley, Dr. Chris Becker from GeneTrace, and Professor Shaul Mukamel from the University of Rochester.

Changing Requirements for Graduate Students

This year the Graduate School eliminated the requirement that graduate students need to spend at least two semesters on campus. This will allow more students to get degrees based on distance education courses. In conjunction with this, the residency requirement for becoming a dissertator was changed from 6 semesters to 32 credits from the Madison campus. Transfer credits will no longer be counted

toward residency, but most students can now finish the residency requirement after 2 years of courses, so most students should be able to achieve dissertator status sooner than previously.

In a move that is expected to help the university become more competitive for graduate students, the new contract with teaching assistants includes a waiver of in-state tuition, effective Spring 1998. This makes Wisconsin more similar to other universities in the Big Ten and throughout the country. Although the tuition waiver will be financed from cuts in the TA salaries, TAs will be better off because of tax savings. A tuition waiver for research assistants will go into effect in Fall. The lost income from RA tuition will be made up through cuts in other programs, perhaps capital spending.

Madison - Still a Great Place to Live

Madison is still considered to be one of the best cities in the country, according to the July 1997 issue of *Money* magazine. Although Madison's ranking fell from first last year to seventh this year (Nashua, NH was rated #1), the magazine still felt that Madison's combination of low unemployment (1.7%), good schools, high tech companies, cultural opportunities, and excellent health care made it a top ten choice once again. Madison ranked best for health care and education; Madison was the

only district in the nation with elementary, middle and high schools designated as National Schools of Excellence by the US Dept. of Education. Madison ranked 16th in the 1995 survey.

"Once Upon A Christmas Cheery"

That yearly tradition, "Once Upon A Christmas Cheery In the Lab of Shakhshiri" continued in 1997. Professor **Bassam Shakhshiri** presented several shows to large crowds at the beginning of December. The 1998 show is scheduled for Dec 5 and 6.

Third Wave Technologies

Third Wave Technologies, a company co-founded by Professor Lloyd Smith, has grown from six employees in 1994 to 50 in 1997. The company has had to have new offices built in Research Park on Madison's west side.



National Mole Day, 1998

National Mole Day, celebrated every Oct 23 from 6:02 AM to 6:02 PM, will have as its 1998 theme "Ride the Molercoaster".

DNA COMPUTING RESEARCH

Rob Corn and **Lloyd Smith** are collaborating with Professors **Anne Condon** from Computer Science and **Max Lagally** from Materials Science to explore and develop DNA computing. Their work was highlighted in the Nov. 28 edition of *The Chronicle of Higher Education*. In DNA computing, strands of DNA contain information encoded in the nucleotide sequence. A series of enzyme reactions can be applied to a set of DNA strands anchored to gold-coated glass, with each

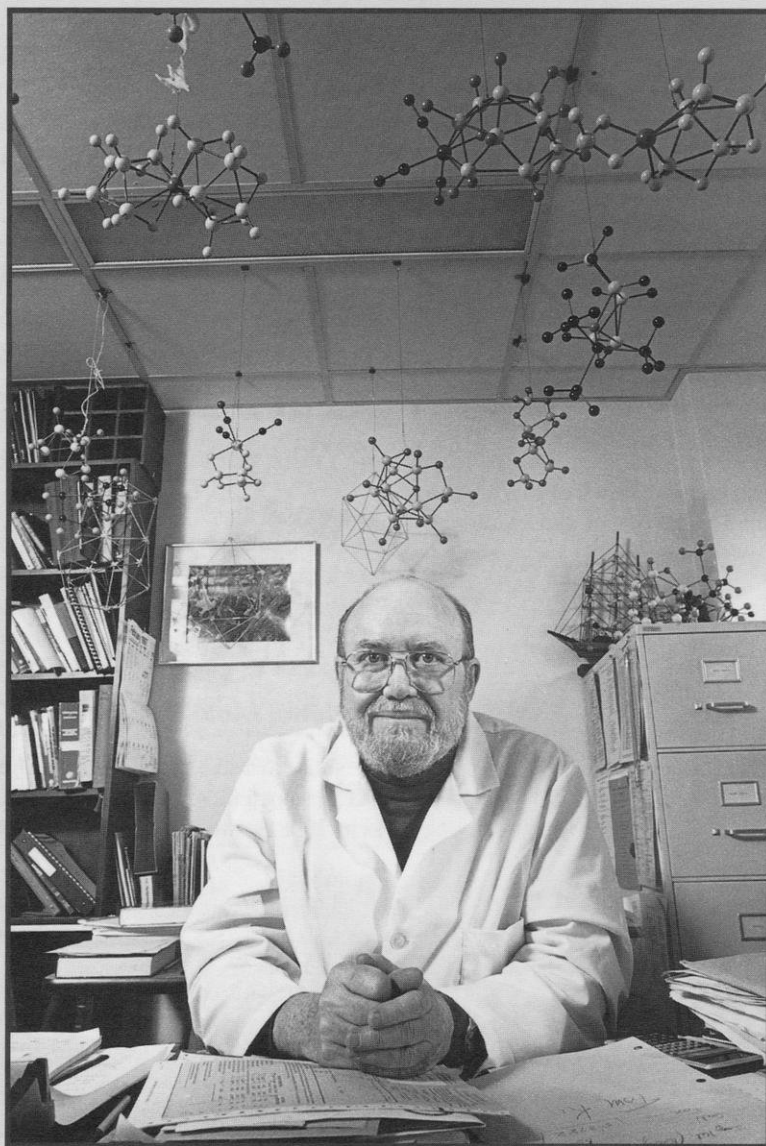


reaction representing one step in a process or one part of a formula to solve. The resulting strands after all steps of the process are completed are then analyzed to determine the results. Although the reactions and analyses are time-consuming, one advantage is that tests can be done in parallel, with each DNA strand representing a different possible answer. Therefore, multiple tests can be run at the same time; and ongoing research is finding new ways to speed up the analyses.



PROFESSIONAL ACCOMPLISHMENTS & UNIVERSITY SERVICE OF PROFESSOR DONALD F. GAINES

(Emeritus Recommendation Letter by Art Ellis)



Professor **Don Gaines** will retire from the faculty at the end of the 1997-98 academic year, when he becomes an emeritus faculty member. While he will continue his research in the Department, he will also be taking on the essential task of chairing the New Building Committee as we head into construction. Below are some reflections from Don, the letter written by Art Ellis nominating Don for emeritus status, and information about a symposium to be held in Fall 1998 in honor of Don's years of research and teaching in the Department.

Professor Donald F. Gaines has served the University of Wisconsin and Department of Chemistry with distinction for 33 years, being first appointed as an Assistant Professor in 1965 and rising through the ranks to Professor in 1976. Professor Gaines taught across the entire curriculum in the Department and presented courses in general chemistry, inorganic chemistry, and a graduate course in main group chemistry. Professor Gaines directed the studies of 8 postdoctoral students, 20 doctoral students, 10 masters students, and 11 undergraduate students. He has published over 110 scholarly articles. Professor Gaines established an international reputation in his research involving compounds of boron, and was recognized with a Distinguished Service Award by his colleagues in this research field in 1990. He has contributed to the growing strength of interdisciplinary research activities on campus with his participation in materials science efforts centered on the growth and characterization of solids.

Professor Gaines participated broadly in the life of the Department. He played a crucial leadership role over the years, chairing the Inorganic Chemistry Division for 8 years and leading the Division as it grew and diversified. Professor Gaines supervised the glass shop in the Department and initiated a training program for students desiring to learn this skill. His efforts benefited the Department in many other ways, ranging from student advising to safety to providing guidance for renewing the facilities of the Department to maintain modern standards. At the campus level, Professor Gaines made valuable contributions through his 30 years of service as a consultant to the Safety Department. Professor Gaines has, in short, made many outstanding contributions to the Department's research, teaching, and service missions over the course of his distinguished career.



A LETTER FROM DON

I arrived at the University of Wisconsin in the summer of 1965 following an undergraduate degree from the College of Idaho, a Ph.D. degree from Indiana University with Riley Schaeffer, and a year and a half of post-doctoral study on a joint project between Indiana University and the University of Manchester in Manchester, England. I have been a member of both the General Chemistry and the Inorganic Divisions throughout my career. I have had one of the best jobs possible, a mixture of teaching and research that has been both challenging and rewarding. In research, my students have directed the majority of their efforts to explorations of the syntheses, reactions, and rearrangements of inorganic and organometallic compounds derived from the boron hydrides, cluster molecular species whose shapes and reactivities are the result of the element boron having one less electron than carbon, but the same number of valence atomic orbitals. My students have prepared and characterized many new classes of boron hydride cluster compounds containing a broad range of other cluster atoms in place of boron. These have included main group elements, from beryllium to lead, and transition elements such as manganese and ruthenium. We have studied isomerizations and fluxional behavior using NMR analysis, solid state structural features using X-ray analysis, and chemical reactivity and applications in other areas of chemistry using a variety of other techniques. As boron hydrides can be very pyrophoric under some conditions, these investigations were occasionally accompanied by fires and explosions, but never by serious injuries. As the synthetic investigations matured and became more reliable, we became more interested in mechanistic investigations of boron hydride reactions. This has resulted in significant new synthetic developments and has fully justified the rather esoteric nature of the

mechanistic investigations. In 1990 I received a Boron USA Award for Distinguished Achievement in Boron Science. In recent years, a separate Materials Research Group was formed with Professors Tom Kuech (Chemical Engineering), Max Lagally (Materials Science and Physics) and Leon McCaughan (Electrical Engineering) to study the mechanisms of formation and growth of epitaxial films of silicon and other semiconductors by chemical vapor deposition. During this phase of our research we characterized the first known molecular compound containing a Beryllium-Silicon bond. We are currently investigating point of use precursors for silane via β -hydride transfer reactions.

All jobs have an administrative component, and in my case the balance has nearly always been about right. I have been the faculty supervisor of the glass shop for about 25 years. I have been the chair of the general chemistry division and, more recently, the inorganic division, and served on the departmental finance committee under several department chairs. I was also a member of the department and university safety committees for many years.

My classroom teaching has included most of the first year chemistry courses, the advanced inorganic chemistry course and several graduate courses in inorganic chemistry. I have been fortunate to have interesting and challenging students, fine teaching assistants and very professional support staff. In fact, the academic staff, shops, and support staff in the chemistry department have always been first class, and have added substantially to the success of our teaching and research pursuits.

Following retirement, I will return part time to the department as chair of the building committee and the chief faculty liaison person during the construction of the new building addition and the renovation of the existing research facilities, in addition to continuing a synthetic research program.

DON GAINES SYMPOSIUM

The Department of Chemistry plans to celebrate Professor Donald Gaines' retirement at the end of this 1997-98 academic year with a one-day symposium on Saturday, October 17, 1998 here in Madison. Don's stature in the chemical community is well known and he plans to continue his outstanding research on boron-containing compounds and on precursors for materials grown by chemical vapor deposition. We see this symposium as an appropriate way to recognize his many contributions to science and the community.

We are pleased to have the following distinguished speakers on our program: William Evans, University of California-Irvine; Thomas Fehlner, University of Notre Dame; Joseph Heppert, University of Kansas; John Morris, University of Strathclyde; Sheldon Shore, Ohio State University; and, of course, Don Gaines. Richard Fenske will return to campus to act as Banquet Master of Ceremonies.

The program will begin with a Friday evening reception to welcome visitors. On Saturday, we will have a poster session in addition to the lectures, concluding with a reception and banquet.

To participate in this gala event, please contact Ms. Mary Kay Sorenson, Department of Chemistry, 1101 University Avenue, Madison, WI 53706 (Phone: 608/262-0363; Fax: 608/262-6143; E-Mail: sorenson@chem.wisc.edu).



CHEMISTRY EDUCATION ACTIVITIES

Grants

Funding for projects in chemical education continues. There was, of course, continuing support for the Editorial Office of the *Journal of Chemical Education*—the editor, three associate editors, and seven assistant editors. In addition, funds were received from the Committee on Institutional Cooperation for a project in Web-Based Course Management. The Dreyfus Foundation provided funds to the *Journal* to produce a special series of papers titled “*Viewpoints: Chemists on Chemistry*”, honoring the 75th anniversary of the *Journal* and the 50th anniversary of the Dreyfus Foundation.

The National Science Foundation provided continuing funds for the New Traditions systemic curriculum initiative (see separate report). In addition, they funded “Materials Science: Updating Teachers with Up-to-Date Chemistry”, a proposal for ICE workshops to be held during the summers of 1998, 1999, 2000, and 2001. The Eisenhower Grant Program, administered through the UW System, also provided ICE with funds for “Super Science Connections: An Integrated Approach to Science Education in Grades K-3”, another workshop to be held in the summer of 1998.

A continuing project funded by the Dreyfus Foundation is “Chem VR: Applying Virtual Reality to Chemical Education”. We are exploring the application of virtual reality software to chemistry instruction by creating virtual laboratories and instruments. An example is the version of a simple spectrophotometer that can be viewed from any angle. The case can be made transparent so that students can see the instrument’s inner workings, and all of the knobs have the effect they normally have on the real instrument.

Meetings

The chemical education group and the New Traditions project hosted several meetings and workshops during the year.

- New Traditions National Visiting Committee Meeting, February 1997
- New Traditions Workshop for Two-Year College Teachers, June 1997
- Super Science Connections Summer Workshop for K-3 Teachers, July 1997
- New Traditions Leadership Team planning meeting, June 1997
- New Traditions Workshop for College Teachers, October 1997
- Super Science Connections and Multiculturalism, October 1997



Visiting Faculty in Residence

Each year there are several faculty from other institutions who spend time with the chemical education group, and 1997 was no exception. During Second Semester 1996-97 we hosted Patricia Metz from Texas Tech University and David Shaw (PhD '75, Treichel) from Madison Area Technical College, both of whom worked with the New Traditions curriculum project. During the Summer the numbers swelled: John Zimmerman from Wabash College, George Gilbert from Denison University,

David Whisnant from Wofford College (PhD '71, Hirschfelder), David Shaw, Theresa Zielinski from Niagara University, Danny Miles from Mount Saint Mary's College in Maryland (who collaborated with both Hyuk Yu and John), and Grant Krow from Temple University. Both Danny Miles and David Shaw remained in residence during First Semester 1997-98.

Journal of Chemical Education

Since 1997 was the *Journal of Chemical Education's* 74th year, we gave considerable thought to planning appropriate festivities and observances of our 75th year. (The *Journal* was founded in 1924 by Neil E. Gordon, the same Neil Gordon who subsequently founded the Gordon Conferences.) We are doing this in several ways—at meetings, in print, and on the World Wide Web.

In print

An important and lasting contribution to our 75th celebrations will be the *Viewpoints Series*. This is a series of special papers, in print and on the Web, that will delineate the recent past and the near-term future of chemistry. Each *Viewpoints* paper will be written by a chemist or group of chemists with special expertise in a particular field, with the aim of providing an overview of that field's accomplishments, importance, and prospects. The goal is to reflect on developments during the past 50 years and to predict how each field will evolve over the next 25 years. Thus the total perspective encompassed by *Viewpoints* corresponds with the 75 years of the *Journal's* lifetime and reflects its comprehensive interest in all of chemistry. The *Viewpoints Series* is supported by funds from The Camille and Henry



Dreyfus Foundation, Inc., which recently celebrated its own 50th anniversary. Also, at the end of the 75th year the *Viewpoints* papers will be gathered together and published separately after being adapted to the needs of a broader audience.

Also in the print medium, the *Journal* staff is preparing a new monthly column titled, From Past Issues that highlights *Journal* happenings from 25, 50, and 75 years ago.

On the Web

The *Journal* has enlarged its presence on the World Wide Web as a part of its 75th anniversary celebrations. The Web address is jchemed.chem.wisc.edu and here one can find a wealth of information: the print *Journal* itself online; information about the *Journal* and its offerings, and special, Web-based material that cannot be accommodated by the print medium.

Our presence at meetings: We will have a larger than usual presence at meetings during the year. If you are at either of the ACS National Meetings, stop by the *Journal* booth at the exposition and see us. We know that many alums do stop by to get the latest news about the department, so the fact that we will have a double booth will make us even easier to find than usual. At the Fall meeting in Boston we will have an evening birthday reception, celebration, and accompanying poster session about the *Journal's* history. In addition to these events, there will be a day-long symposium that first revisits the *Journal's* past and then looks toward its future and the future of scientific publishing.

The 15th Biennial Conference on Chemical Education occurs in 1998 and will attract a large number of people interested in chemistry education. It is to be held at the University of Waterloo in August. Here, too, the *Journal* will celebrate its anniversary with posters, memorabilia, special lectures, and a big birthday cake.

There were two changes in the *Journal* staff during the year. Randall J. Wildman replaced Amanda Reinert in July and Agnes Ma (PhD '94, Dahl) joined the staff in December. Randy is our graphics specialist and Agnes is working on Web related materials part of the time and copy editing part of the time.

• • •

The New Traditions Project-Year Three!

The New Traditions curricular reform project is speeding toward the end of its third year. At its meeting in January, the National Visiting Committee unanimously recommended that NSF continue funding for the final two-year phase of the five-year project. The format of the project was such that the first two years were spent on developing innovative pedagogical techniques that could be used to both enhance student learning and to have the students take greater responsibility for their own learning. In year three, we planned to test the innovations in a variety of settings represented within our consortium: two-year colleges, four-year colleges, a comprehensive university, and major research universities. Unexpectedly, we are running ahead of schedule and have run two very successful workshops for teams of faculty from colleges and universities from the Midwest to train them in the effective implementation of these innovations, with a third workshop scheduled for April 1998. Please visit our World Wide Web site at <http://newtraditions.chem.wisc.edu/> to see the full scope of our activities.

We have learned that active learning strategies can be adapted for use with diverse student populations at diverse institutions. We have also learned that it's a necessary but not sufficient condition that the students learn content. To quote John Wright, "Students must also learn the habits of the mind that characterize scientific thinking." To accomplish this, we have to expose students to authentic experiences that require the use of problem solving strategies as practiced by skilled scientists. The roles of both faculty and student have to change to bring about this change. The role of the instructor changes from lecturing to acting as a consultant. Instead of providing definite answers, the instructor allows students to puzzle through problems. In lieu of providing step-by-step directions, the instructor encourages students to develop their own methodologies to obtain experimental results and to interpret evidence to discover trends and alternatives. The role of the student changes from asking for the "right" answer or asking, "Will this be on the exam?" to struggling with problems and developing deeper understanding through interactions

with peers, testing predictions and hypotheses, and formulating explanations in his/her own words.

Among the various strategies that the NT Project uses to encourage the types of pedagogical and curricular changes we propose are the following:

- use the power of peer interaction to help students achieve deeper, more personal understanding;
- collect and disseminate innovations created by the "cottage industry" of individuals who have experimented with different pedagogical approaches;
- provide for continual, incremental improvement by taking courses as the basic units of faculty action, implementing one or more changes, and carrying out cycles of adapt, evaluate, and adapt.

The first of these is an on-going effort that encompasses learning communities in various sizes: from small group work in the laboratory and in discussion sections, to entire laboratory and discussion sections comprised of engineering majors, to placing students from an entire residence hall complex into a single lecture section. The second strategy is the basis for the representation of the four-year institutions within the NT consortium. UW-Madison has long been recognized as a center for excellence in chemistry education; the Discovery Chemistry program was developed at Holy Cross; the lectureless approach was developed at Franklin & Marshall; the "blended" general/organic chemistry course sequence is being developed at San Jose State University; and the University of Illinois at Urbana-Campaign is one of the pioneers in developing peer learning communities for minority/disadvantaged students.

The third strategy has become our major focus as we enter the "home stretch" of our five-year project. The mandate from the National Visiting Committee, after reading the third-year report and meeting with the Project Leadership Team, is to "Disseminate, disseminate, disseminate." We now have additional institutions that are partnered with us through NSF's "Adapt and Adopt" grant competition: Portland State University (OR), Portland Community College, and the Iowa General Chemistry Network (a consortium of twelve community colleges, five private



colleges and the three Regents' Universities). In addition to working with these institutions, we also plan to expand our schedule of workshops to make them more readily accessible to institutions in other parts of the country. We also have videotapes that may be borrowed that describe 1) the NT Project in general, and 2) active learning strategies for large lecture classes.

If you are interested in learning more about our workshop schedule as it develops or if you wish to borrow one of the videotapes, please contact Dr. G. Earl Peace, Associate Director of the NT Project, at (608) 262-8647 or by e-mail at gpeacejr@facstaff.wisc.edu.

Institute for Chemical Education (ICE)

Under John Moore's direction and with the help of outreach workers Amy Huseth and Kathleen Shanks, the Institute for Chemical Education (ICE) has been actively involved in chemistry education the past year. Three new publications and one kit were developed to help teachers effectively integrate chemistry into their curriculum. *A Proceedings on Cost-Effective Chemistry* was compiled by educators and scientists who participated in the 1996 International Conference on Cost-Effective Education. *The Proceedings* contains over 30 low-cost activities, instruments, experiments, and laboratories. *Scientific Ethics for High School Students* was created to introduce students to

ethical issues in scientific investigations. This publication uses case studies to stimulate classroom discussion about various topics, such as obtaining data, laboratory safety, computing ethics, and working with others. *The Chemistry Companion for Middle School Science Teachers* provides teachers with the resources to revitalize the middle level curricula. Teachers can use this publication with *Fun with Chemistry, Volumes 1 and 2*, and the *Chem Camp Handbook* to include more demonstrations, hands-on activities, and laboratories into their science courses. *The Line of Resistance* kit was developed as a joint effort by ICE and General Atomics Sciences Education Foundation to encourage students to discover electrical resistivity of graphite and wire, resistance of series and parallel circuits, and open and short circuits. We have also learned that ICE's publication, *The Hole in the Ozone Layer*, is being used as a major resource for one of the curriculum modules developed by the ChemLinks project, an NSF systemic curriculum reform project similar to New Traditions.

In addition to creating several wonderful publications for teachers, ICE hosted the fourth year of Super Science Connections (SSC), a physical science workshop for elementary teachers that connects science to other areas of the curricula-children's literature, writing, mathematics, art, social studies, and health. Four veteran instructors (Pat McKean, Celeste Bunting, Margie Zimmerman, and Laura Huber) helped to make this workshop a great success.

Teachers from Madison, Verona, and Oregon attended SSC, learning exciting hands-on activities to arouse students' interest and inspire them to enjoy science. The four instructors returned to Madison during Fall 1997 to modify Super Science Connections in a joint effort with Dr. Alberto Rodriguez (Curriculum and Instruction Professor for the School of Education) to include a multicultural format. The 1997 SSC group is shown in the photograph.

As a result of the Fall 1997 meeting and funding from the Eisenhower Professional Development Program, ICE plans to host the fifth Super Science Connections workshop this summer (July 13-24, 1998). With funding from the National Science Foundation, the Institute for Chemical Education will also offer the Chemistry and Materials Science Workshop for 40 high school science teachers this summer (July 6-24, 1998). Chemistry and Materials Science combines the efforts of John Moore, Art Ellis, and George Lisensky (of Beloit College) to provide a body of chemistry that was not included in most teachers' pre-service education. Using *Teaching General Chemistry: A Materials Science Companion* as a guide, teachers will develop hands-on activities, laboratories, and lesson plans for use in the high school classroom.

For information on our two Summer 1998 workshops and our publications, please contact the Institute for Chemical Education or visit our Web site at <http://ice.chem.wisc.edu/ice/>.



John Moore



Jon Holmes



Betty Moore



Nancy Gettys



Eric Kolstad



Agnes Ma



Lin Morris



Mary Saecker



Carol Steinhart



Alice Teter



Gail Thorson



Randy Wildman





OUR COMMITMENT TO OUR COMMUNITY

EDITOR'S NOTE:

This letter was sent to University President Lyall by a grateful correspondent who received help from Betty Moore and Kristen Meddaugh at the Journal of Chemical Education. It is but one example of a key characteristic of the Department and the University - a commitment to service to the community. Other examples of this commitment are shown in the centerfold pictorial display.

March 9, 1998
President
University of Wisconsin
Madison, WI

FIFTY FIVE YEARS OF AFFECTION FOR THE UNIVERSITY OF WISCONSIN ONE FULL CIRCLE

Fifty-five years ago I was a combat infantry man in W.W.II in Europe. There I had two responsibilities: my machine gun and the task of being the Information and Education Group Leader of my Company. Between skirmishes I disseminated information, given to me by the Army, relating to the progress of the war. But more important to me was the fact that I could obtain educational material from the University of Wisconsin, the home base for the United States Armed Forces Institute [USAFI]. It was by this means that I was able to help many of my combat peers obtain elementary and high school diplomas for themselves, while I took advantage of review courses for myself. Needless to say the arrangement was a blessing to all who participated. Those in charge at the University; their help and courteous correspondence has never been forgotten by me. It was from this experience that each year since, I say to my friends, "One day I will go to Madison, Wisconsin and walk around the campus."

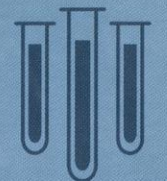
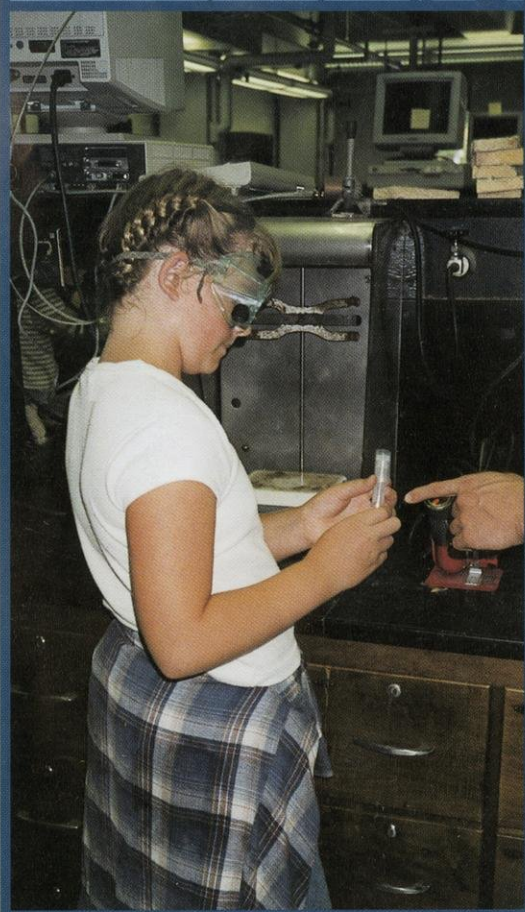
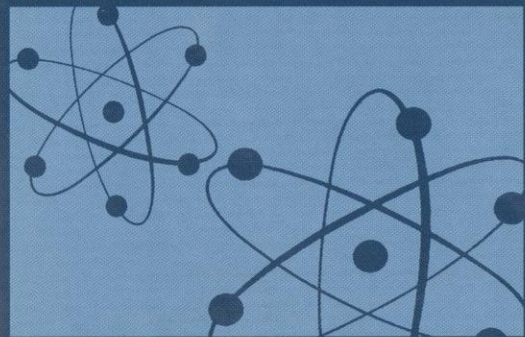
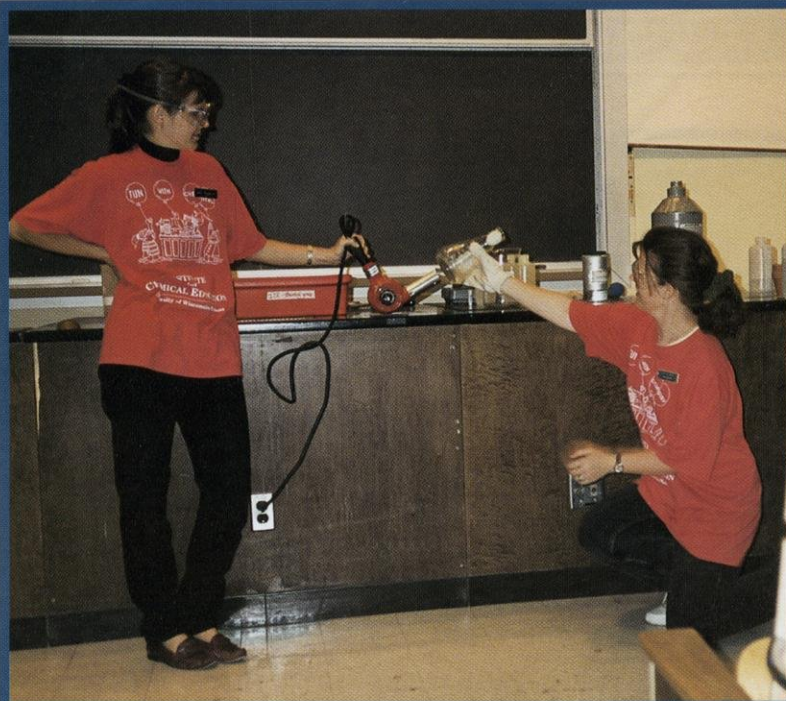
I am now near 80 years of age and have been for the past five years searching for a small but important publication [to me] that was published in the *Journal of Chemical Education*, back in 1950. I have had literature searches made just about everywhere with no success. A week ago, I received a letter from San Jacinto College inquiring how long have I been reading the *Journal of Chemical Education*. I responded to the question and put in an off chance note "Did you ever run into a paper covering an article depicting atomic orbital models made with balloons? Perhaps you can help me find it." Two days later I received a letter from the University of Wisconsin: "The letter you sent to Jacinto was forwarded to us." Almost unbelievable one elusive page brought to the shore of light not by duty but by the true spirit to help another achieve. Something to awe.

As I previously said, 55 years ago I ordered documents from your University. It is now 1998 and they are still helping me. "One Full Circle" I commend the named persons who found "a needle in the hay stack" to you. And I thank my University of Wisconsin.

Respectfully,
Frank Z Pollara



SUPER SCIENCE CONNECTIONS & CHEM CAMP '97 PARTICIPANTS





THE OVERVIEW

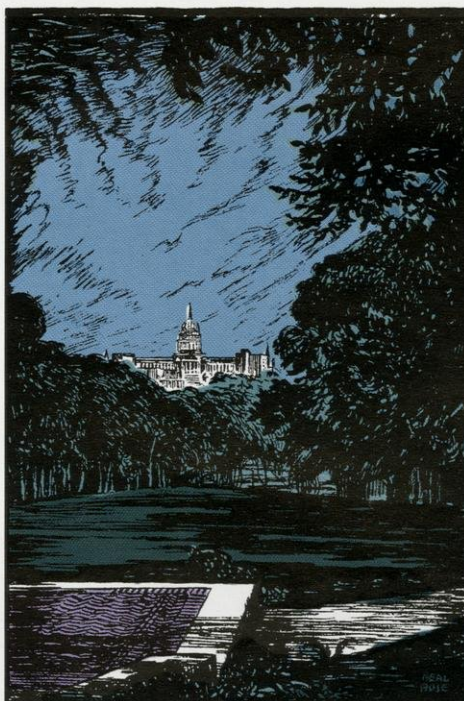
Looking back at the past year and thinking about the primary focus of the Department, four topics jumped out as being at the top of our agenda this year and, likely, for the next several years. They are undergraduate and graduate education, scholarship, facilities, and faculty recruiting.

Undergraduate Education

We taught over 20,000 credits of undergraduate chemistry this year. That is about 30% more than we taught in 1990 and is 7.3% of all the credits taught in the College of Letters and Science. We are teaching many students, and, as our numerous local and national awards attest, we are teaching them well. Providing instruction to so many students has strained our resources, but we are committed to continued excellence as well as to developing new instructional tools and approaches. The demand has been particularly great in Chemistry 109 and 110 and the introductory organic courses. A large spring enrollment in organic lab led to our holding labs Monday through Thursday evenings and Saturday morning, in addition to the normal weekday labs. By the time you read this we will have hired an Assistant Organic Lab Director to help Paul Schatz with the extra duties required to run effective labs for the large number of students. As the demand for chemistry classes increases, we find ourselves looking more and more to the community to provide able teaching assistants and lecturers for our courses. This coming fall will find our faculty as small as it has been in almost a decade, a situation that makes faculty recruiting particularly important for both our teaching and research.

Faculty recruiting

Faculty recruiting began in earnest in our Department this year. We conducted broadbased searches for one or more faculty members in any area of chemistry and met many first rate candidates. The process has worked well and involved faculty across the Department. A search



committee did the hard work of screening candidates, and all the faculty paid careful attention to the visits of the candidates. This year is the first in a multiple-year plan to renew our scholarship and teaching in the face of retirements over the next decade.

Graduate Education and Research

The scholarship of the Department is flourishing. The faculty raised over \$10 million of external research funds last year

and continued to garner national and international recognition. We also fared well in the competition for University Awards. Our nominations were successful in all three major categories of professorial recognition: Hyuk Yu won a University Houses Professorship, Jim Weisshaar received a Mid-Career Award, and Gil Nathanson captured a Romnes Faculty Fellowship. Our two nominees for Vilas Associate Awards, Bob Hamers and Mark Ediger, won as well. In addition two members of our Department who have joint appointments with Biochemistry were nominated and received awards through that Department. Ron Raines won a Romnes Faculty Fellowship, and Tom Record won a Vilas Associate Award. Our distinguished colleagues continue to receive well deserved recognition from the University. This outstanding research environment has continued to attract well qualified graduate students to the Department. Although our numbers are down somewhat from historical levels, the quality is as good as it has been. The high level of scholarship, the newly-instituted tuition waiver for graduate students, and the construction of a new building should all help to make the Department even more attractive to future students.

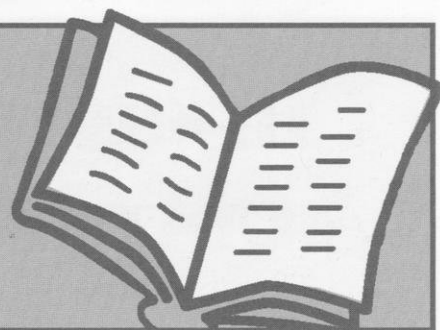
Building Addition and Renovation

The building addition is an immediate focus of our attention. The design is complete, and we will receive bids in the summer. The design team has worked very hard in the last months to complete the process, and the project is about to become a reality. The new building, housing synthetic labs, an addition to the Instrument Center, and an administrative suite, should be finished sometime in summer of 2000. Renovation of the existing buildings will be finished about two years later.



LIBRARY NEWS

UW Hosts Major Chemistry Database for colleges and universities in the U.S. and Canada.



For more than 100 years the "Beilstein Handbuch" has been a standard reference for chemists seeking information about the preparations, properties and reactions of organic compounds. Unfortunately, in the last decade or so, fewer and fewer chemists have been able to avail themselves of the immense store of information contained in its more than 500 volumes. Beilstein, like many scientific journals these days, became caught up in a price spiral which made it unaffordable for most universities. By the mid 1990's the annual subscription price approached \$30,000! Compounding the cost problem, the dozen or so universities in the U.S. who clung to their subscriptions noticed that usage of the Handbook was declining rapidly as a new generation of chemists turned to more convenient, more current, computerized indexes. An added benefit was that they didn't require a knowledge of German. The handwriting seemed to be on the wall for Beilstein. A more current, on-line version of Beilstein was launched in the late 1980s, but its complicated search interface and the uncontrollable costs associated with remote access, on-line searching discouraged most users.

In 1994, however, matters took a dramatic turn for the better when a newly reorganized Beilstein enterprise introduced "Beilstein CrossFire." *CrossFire* exploited the latest developments in client-server computer technology. The Beilstein data - leased for a single, annual fee - can be mounted on a local server, thereby offering round-the-clock, cost-controlled access. Users across campus search the database via client software which they download to their computers. Librarians have found that a brief introduction to *CrossFire*'s user-friendly, graphic interface is usually sufficient for most users to begin to take advantage of its powerful search capabilities. Using the chemical draw program, for example, a student or researcher can search through *CrossFire*'s eight million compounds in a matter of seconds and locate all molecules which

possess a common molecular fragment - and then quickly follow reaction paths via hyperlinked numbers attached to starting materials and products. The more than five million reactions in *CrossFire* may also be searched by exact or partial structures. Such impressive features - combined with the much more realistic subscription pricing model - soon put the Beilstein enterprise on the road to recovery, in academe as well as in industry.

The University of Wisconsin has played a key role in *CrossFire*'s academic success story. In the fall of 1994 the UW became the first university to install the *CrossFire* database. It soon became apparent to UW Library Director, Ken Frazier, that Beilstein *CrossFire* might be an ideal candidate for testing a new, cost-saving idea that was being discussed at that time by library leaders seeking to exploit the potential of the Internet. Why not mount a database at a single university which would be shared, via the Internet, by a consortium of libraries? Working with the CIC (basically, Big Ten Universities plus Chicago) Frazier negotiated just such an agreement with Beilstein Information Systems. As a result, all participants gained access to *CrossFire* at a much lower price. Just as important, they were also spared the costs and delays that would inevitably arise with individual installations. The UW was to be compensated for agreeing to host the database. The CIC agreement was completed early in 1995 and was a nearly instant success. Within a few months *CrossFire* was being heavily used by chemistry students and faculty throughout the CIC. The agreement brought an added benefit for Wisconsin: all UW campuses were permitted access at no additional cost.

The CIC-Beilstein consortium became a model for similar agreements which were soon put together in Great Britain, Europe and Australia. Less than a year after it was signed, however, Frazier and UW Chemistry Librarian Ken Rouse approached Beilstein management with a proposal for a much larger consortium that

promised even more generous terms, one that would be open to any college or university in the United States or Canada. Beilstein embraced the new concept and launched what they dubbed the "Minerva Project," after the Roman goddess of wisdom. With the blessings of Minerva, the consortium has expanded rapidly in the past year and now includes more than 50 of the largest and most prestigious universities in North America. To promote the continued growth of the consortium, Beilstein has expanded the content of the database and introduced new pricing options. *CrossFire* now includes *CrossFire/Gmelin*, a huge database devoted to inorganic and organometallic chemistry. A recently announced, four-tiered pricing structure was designed to make *CrossFire* more affordable for smaller colleges and universities. Early reports from *CrossFire* users at Big Ten universities had suggested that it was not only an essential tool for advanced researchers, rather one that could be used to good advantage wherever chemistry was taught. The UW has even sponsored a pilot project designed to explore *CrossFire*'s use as a teaching tool in high schools.

In a recent month, the General Library System's server at the Madison Area Computer Center logged more than 14,000 *CrossFire* sessions by users from Boston to Berkeley. Clearly, the venerable Beilstein Handbuch" which seemed to be on its last legs only few years ago, has gained a new lease on life in the computer era.

More information about Beilstein CrossFire at the UW may be obtained from the following:

Emily Wixson; Chemical Information and Outreach Librarian Steenbock Library; Telephone: 608-263-2411; email: wixson@vhs2.macc.wisc.edu.

David Waugh; Technical Coordinator for the Minerva Project; Memorial Library; Telephone: 608-262-0240; email: Waugh@macc.wisc.edu.

Ken Rouse; Head, Chemistry Library; Telephone: 608-262-2942; email: krouse@macc.wisc.edu.



CHEMISTRY BUILDING ADDITION & RENOVATION

Bob McMahon, Building Committee Chair



The Department looks forward with great anticipation to the beginning of construction for the new chemistry building addition during the summer of 1998! The project timeline described last year in BC 41 slipped by approximately five months due to the complexity of the design of the renovation phase. We are pleased to report that design work for the entire addition/renovation project was completed in March 1998. Bid opening for the construction project will occur in May 1998, with construction to commence during the summer. Watch your mail for a separate announcement from the Department describing our plans for the long-awaited groundbreaking ceremony!

Progress Report

During mid-1997, the building project received final approvals from the City of Madison Urban Design Commission and Planning Commission. Following resolution of the confusion regarding the location of the property line between the University and the Wesley Foundation (BC 41), Rev. Dianne Reistroffer, Pastor of University United Methodist Church and Executive Director of the Wesley Foundation, spoke publicly in support of the chemistry project before each city commission. In a related matter, the Wesley Foundation recently declined to extend the lease for the University's daycare center, citing the difficulties in achieving appropriate standards for a daycare center within their 80-year old church facility. The center will move out of the church at the end of the spring semester, prior to the beginning of construction of the chemistry addition.

A full-scale mock-up of a typical synthetic chemistry laboratory for the new addition was constructed in a warehouse in Verona during early 1997 in order to assess critical details of the laboratory design. In March 1998, the Department purchased and installed a prototype fume hood of the type specified for the new addition, in order to evaluate this critical component of the laboratory design. These two projects provided the opportunity for significant input from graduate students, postdocs, faculty, and staff. The careful attention to detail displayed by the Department is already bearing fruit. An NIH Engineering Review Team visited campus in December 1997, and provided very favorable comments concerning both lab design and overall building design. Project managers from the UW-Madison Facilities Planning and Management and the engineering firm of Affiliated Engineers, Inc. complemented the Department on the high quality of its final

review comments, saying the comments were the best they have ever seen from an owner/user group.

Funding / Budget

Following completion of the design phase, the architects developed their final cost estimate for the project. The estimated cost exceeds the original budget of \$31.4 M by approximately \$3.7 M. The state-of-the-art seminar hall adds an additional \$2.6 M. Rather than reducing the scope of the project, the Department, the College, and the University committed to raise the additional \$3.7 M that is required to complete the project as currently designed. The seminar hall, however, will not be constructed unless a major donor is identified. The Department continues to solicit support for all phases of the Building Project. Naming opportunities remain for donations at many different levels. (Contact Fleming Crim, or visit the Department's website at www.chem.wisc.edu/news/buildingcampaign.html, for further details.)

PROJECT BUDGET

1. Base Bid

Construction Costs	
New Addition	\$20,000,000
Renovation (primarily Daniels wing)	4,750,000
Design and Supervision	4,000,000
Moveable Equipment	1,350,000
Contingency	1,237,000
Percent for Art	63,000
Base Bid	\$31,400,000

2. Alternate Bids - Renovation

Construction Costs	
Essential Laboratory Areas (primarily Mathews wing)	\$2,220,000
Chemistry Learning Center	235,000
Glass / Electronics Shops	285,000
Instrument Center	100,000
Theoretical Chemistry Suite	280,000
Library Expansion	165,000
Design and Supervision	415,000
Renovation Package	\$3,700,000

3. Alternate Bid - Seminar Hall

\$2,600,000

Building Committee

With the beginning of construction this summer, I will conclude my 3.5-year tenure as chair of the Chemistry Building Committee. I am extremely pleased to announce that Don Gaines has agreed to chair the committee and to serve as the Department's representative in overseeing the construction project. The Department is most grateful to Don for his willingness to assume this important responsibility!

Set your web browser to the Chemistry Department's website (www.chem.wisc.edu) for weekly updates and pictures during the construction phase!





THIS 'N' THAT

Eric J. Amis (PhD '81, Yu) moved to the Polymers Division of NIST in March of 1995 to take the position of Group Leader, Polymer Blends, Polymers Division, from his position as Associate Professor of Chemistry at USC. He has been the editor of the Journal of Polymer Science, Polymer Physics Edition for the past 6 years.

Mark Baker (PhD '92, Zimmerman) writes from Lubrizol to say that he is doing well.

Sue Bauman (BS '65) was elected mayor of Madison, Wisconsin in spring 1997. Mayor Bauman completed a Master's degree in Physical Chemistry at the University of Chicago after leaving Wisconsin.

Adolph Bohnstedt (PhD '94, Rich) is a Senior Research Chemist at Pharmacoepia in Princeton NJ.

Christiane Boie (PD '96-'97, Rich) joined Bayer Research, Wuppertal, Germany as a senior research chemist.

Bob Brainard (PhD '97, Ellis) joined the technical staff at Intel in Santa Clara, California.

Barry Brueggeman (PhD '80, Schrag) is the head of the new analytical chemistry team at Exxon Chemical Co., Baytown, Texas.

Taihyun Chang (PhD '83, Yu), Professor of Chemistry, Pohang University of Science & Technology, Pohang, Korea, has been spending a sabbatical year at University of Minnesota with **Timothy P. Lodge** (PhD '80, Schrag). At the same time he has been hosting **Qi-Jiang Gu** (PD '83-'85, Yu) from Xian, China, to work in his laboratory in Pohang for the year, concentrating on anionic syntheses of block copolymers.

Tsun-Mei Chang (PhD '92, Skinner) is now a postdoc at the University of Illinois working with Prof. Ken Schweizer.

Natalie Dales (PhD '97, Rich) is a senior research chemist at Shionogi Research Institute in Massachusetts.

Peter Dorhout (PhD '89, Ellis) was promoted to Associate Professor with tenure at Colorado State University.

Sergei Egorov (PhD '96, Skinner) is now a postdoc with **Jim Skinner**, after spending a year as a postdoc at Columbia with Prof. Bruce Berne.

Prof. Steven Fleming (PhD '85, Zimmerman) of Brigham Young, and **Prof. Jerry Scheffer** (PhD '67, Zimmerman) of UBC Vancouver have agreed to co-chair the forthcoming Symposium on Organic Photochemistry at PACIFICHEM2000 in Honolulu.

Angelo Giumanini (PD '65-'66, Zimmerman) writes from the University of Udine, Italy, that he is working with a modestly small but hardworking research group and that things are going well.

Peter Glunz (PhD '97, Rich) is carrying out postdoctoral research with Sam Danishevsky.

Roger Hahn (PD '63-'65, Zimmerman) reports that he is kept busy as a professor at Syracuse and these days is doing research on gypsy moth chemistry.

Charles C. Han (PhD '74, Yu) has been a Research Fellow of NIST, the highest of the scientific ladder, since 1996, and his is the first such honor for a member of the Polymers Division of NIST since its inception.

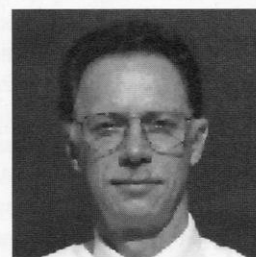
Jenny Heydinger (PhD '90, Zimmerman) is now Director of Corporate Research for Stephan Co. in New Jersey.

James Janetka (PhD '96, Rich) is a Senior Research Chemist at Vertex Pharmaceuticals.

Dan Juers (BS '64, PhD '71, Zimmerman) wrote from DuPont, Photo Products Department in Rochester, New York, saying that his career at DuPont has been a successful one.

Chung Yup Kim (PD '78-'80, Yu), Head of the Laboratory of Polymeric Materials, Korea Institute of Science & Technology, was the Chairman of the Pacific Polymer Congress held in Kyungju, Republic of Korea, in October, 1997.

Stan Kosiewicz (PhD '73, Haskin) continues to find the field of nuclear waste management rewarding. In the last year, he added three awards to the list of kudos he's received for his contributions to transuranic (TRU) waste management at the Los Alamos National Laboratory (LANL) in New Mexico. The Department of Energy gave his team a Silver Level Quality Award. The LANL selected him for an Achievement Award (his second in as many years). This summer, he learned that he won first place in the Best Oral Paper Competition for the national waste management conference, WM'97, that was held in Tucson, AZ in March 1997. Nearly 250 oral papers were delivered at the conference. Both the oral presentation and accompanying written, technical paper were evaluated for the competition. The award winning paper described potential strategies for preparing TRU waste for shipment to a geologic repository, WIPP, that are estimated to save nearly one third of a billion dollars. "That's a good chunk of change to save the taxpayers!" said Kosiewicz. Kosiewicz will receive his award, a trophy shaped like a Saguaro cactus, during the plenary session at the next conference, WM98, in Tucson, AZ in March 1998.



KAREN WEILAND

Karen Weiland (PhD '87, Crim) wrote about her current activities with NASA and the space shuttle. This past year, the experiment I have been working on finally flew on the space shuttle Columbia. The whirlwind of activities prior to the shipment of the hardware to the Kennedy Space Center reminded me of graduate school days, and finishing my dissertation. After quite a few long days and weekends, the experiment finally made it there.

After shipment of the hardware, I made several trips to Kennedy and the Marshall Space Flight Center in Huntsville, AL for testing and mission simulations. The Spacelab operations are conducted at MSFC, and that's where all the data and video gets downlinked.

My husband Ken and I went to Florida to see the launch in April. It was quite impressive. The video cameras capture much of the drama, but it is not like being there and hearing the crackle of the rockets and seeing the blinding flare of the exhaust plume. Then we drove to Huntsville. I got there just in time to hear that there was a problem with the shuttle, and it would probably have to land early. I felt like six years of work had been just flushed down the drain, but the shuttle stayed up long enough that we were able to conduct two test runs and verify that the experiment would work. Then the next day



the science teams were stunned to find out that the payloads would fly again in July. We were stunned that, first, NASA had made a decision that fast, and second, that we would be flying again so soon. Shuttle flights usually are manifested about 18 to 24 months before launch.

After the mission in April, I found out I had won an award that was to be presented in Florida and included viewing the night launch in May. That was even more impressive, as the wind was nil, so the sound bounced right off the river and was significantly louder. The exhaust plume was so bright that it was impossible to use binoculars to see the shuttle. Ken got some really nice photos using a borrowed Nikon and 300 mm lens with 2X extender.

Anyway, the mission in July was incredible. Our science team ran 2 12 hours shifts for 10 days, and I was the lead on one of the shifts. The other shift was led by the coinvestigator from USC, as the PI had been selected to be the Alternate Payload Specialist and so was on console for 12 hours also. We conducted 17 test runs, and 16 ignited. We had flame balls lasting for many minutes, just as the PI had predicted. One of the most special things about it was all the media coverage. I got to talk with Marcia Dunn from the Associated Press and her article was all over the country, even in the New York Times. Unfortunately, the Cleveland press was totally uninterested and just carried one paragraph a day on the progress. The fact that Pathfinder/Sojourner landed on Mars at the same time added to the drama. It was neat as a chemist to see that little gizmo doing X-ray spectroscopy on another planet, while doing combustion science on a spacecraft.

Life is beginning to settle down in to looking at lots of data and returning to the lab to continue my own research on diagnostics for microgravity combustion. I was able to spend a few hours talking with **Tom Ticich** (PhD '88, Crim) and his student Brock who were at NASA Lewis for the summer working with Randy Vander Wal. Tom seems to be adapting well to life in the South.

David Kurtz (PD '71-'73, Zimmerman) wrote saying that he is now Chairman at Ohio Northern University.

Curt Kreil (BS '77, Zimmerman) notes that he is presently with Imation Enterprises in White City, Oregon. He moved from 3M.

Marv Lang (MS '64, West), Chemistry Professor at UW-Stevens Point, received the 1997 Helen M. Free Award in Public Outreach at the ACS national meeting in Las Vegas. The award is presented to

an ACS member "who has made a major effort to communicate with the public about the contributions of the chemical sciences to the quality of life."

Jungsik Lee (PhD '90, Yu) moved to S.C. Johnson Polymer in Racine, WI, last year from Rohm & Haas in Philadelphia.

Bob Lewis (PhD '65, Zimmerman) reports that he has been a Senior Scientist at the Environmental Protection Agency in North Carolina for the last three years.

Christopher Lynch (PhD '95, Rich) joined Merck as a Senior Research Chemist.

Darren March (PD '97, Rich) is at Australian National University at Canberra.

Darwin L. Mayfield (PhD '50, Adkins) retired in 1990 after 34 years on the chemistry faculty of California State University, Long Beach. Among other pastimes since retirement, he has been sponsoring a monthly gathering of high



school chemistry teachers. The program is described in a recent article in the *Journal of Chemical Education: Notes on an Outreach Forum for High School Chemistry Teachers - An Unexpected Success*, Mayfield, D.L., J. Chem. Educ., 1997, 74, 524-525.

Theresa McIntire (BS '89) received her PhD degree in Biophysical Polymer Chemistry with Dr. David M. Brant at the University of California in March 1997.

Ron McKelvey (PhD '71, Zimmerman), Professor at U.W.-LaCrosse, reports that he traveled to China with a delegation. Also he traveled to Nepal for two weeks. His interest was in establishing collaborations and also in local herbs as medicinals for study. He also traveled to India for three weeks.

Jim Meyer (BS '66, Zimmerman) is now Senior Vice President and Chief Technical Officer at Eastman Kodak. He writes with an optimistic view towards the future.

Evan C. Miller (PhD '94, Yu) moved to Silicon Graphics in Silicon Valley at the beginning of this year from Cape Cod Research at Falmouth, MA.

Cathy Murphy (PhD '90, Ellis) was promoted to Associate Professor with tenure at U. South Carolina.

Don Neu (PhD '93, Ellis) was promoted to Associate Professor with tenure at St. Cloud State University.

Maurice Oehler (MS '61, Zimmerman) retired as a high school teacher but is quite active in the La Crosse-Winona Section of the ACS.

John Penn (PhD '82, Zimmerman) writes that things are going well for him as a professor at West Virginia University. He is now an advisor for the American Chemical Society Student Affiliates at W.V.U. and the group has been nationally recognized for two years in a row.

Prakash Raman (PhD '97, Rich) is working with Jeff Kelly at Scripps.

Bob Sammler (PhD '85, Schrag) obtained seven key patents and received two special recognition awards at Dow Chemical, Midland, MI. He spent some time last year visiting Prof. Joachim Meissner's labs at ETH-Zurich. Bob is heavily involved with new European plants acquired by Dow for production of polypropylene and polyethylene-terephthalate.

Masahito Sano (PhD-Physics '87, Yu) moved to a JST laboratory in Kurume, Kyushu, from another one at Tsukuba, Ibaragi, Japan.

Jeff Saven (PhD '93, Skinner) is now Assistant Professor of Chemistry at the University of Pennsylvania.

Fred Schaefer (PhD '90, Schrag) moved to College Misericordia, Dallas, PA, to set up a chemistry major program.

Prof. Joachim ("Josh") Schantl (PD '65-'67, Zimmerman) writes from Innsbruck, Austria that he has an active group of eight students and that research has been exciting lately. Not too long ago Josh stopped in to see how his old group was doing.

John ("Jerry") Scheffer (PhD '67, Zimmerman), professor at UBC, Vancouver, is spending a sabbatical at Strassbourg with Jean-Marie Lehn.

Michael Solomon (PhD '97, Rich) is working with K.C. Nicolau.

Matt Stephens (PhD '96, Skinner) is now on the research staff of StarMet, a company specializing in high-tech alloys.

Ted Stokich (PhD '88, Schrag) received three special recognition awards at Dow Chemical, Midland, MI. He is retiring from the Naval Reserve, where he has been Chief-of-Staff in the Intelligence Program.

Hideo Takezoe (PD '79-'81, Yu), a Professor of Organic Materials at Tokyo Institute of Technology, is now an Associate Editor (responsible for the liquid crystals segment) of the Japanese Journal of Applied Physics, "Oyo Butsuri".

Kaoru Tamada (PD '91-'93, Yu), a staff member of the National Institute of Chemical and Materials Research, Ministry of International Trade and Industry, Tsukuba, Japan, will be spending

a year, starting April of 1998, at the Max-Planck-Institut für Polymerforschung, Mainz, Germany, to work on interface spectroscopy in the group of Prof. Wolfgang Knoll.

Mike Tollfson (BS '92, Zimmerman) notes that he is now at Monsanto doing medicinal chemistry. His son is now 2 years old and is growing fast. After leaving Wisconsin, Mike did his Ph.D. work at Illinois.

Donald Towns (PhD '62, Goering) reports that he retired at the end of May, 1997. He has moved to Naples, Florida, where he does a little consulting and a lot of work around the house. His address in Florida is Dr. Donald L. Towns, 2000 L'Ambiance Circle Unit 102, Naples, FL 34108-6737 (941 513 9534). Summers he spends on Cape Cod, 112 Studley Road, South Yarmouth, MA 02664-2906 (508 760 3816). He would be glad to hear from any of his old friends and associates.

Ching Y. Tseng (PhD '65, Zimmerman) writes that he has retired from International Flavors and Perfumes and has moved to the west coast. He would like the Department and his classmates to have his new address, 3410 179th, Ave. NE, Redmond, WA 98052-5812.

Roger Tung (PhD '87, Rich) was promoted to Vice President of Chemistry at Vertex Pharmaceuticals, Cambridge MA.

Dean Waldow (PhD '89, Ediger) was recently promoted to Associate Professor of Chemistry with tenure at Pacific Lutheran University in Tacoma, Washington. Dean has been receiving NSF funding to study phase separation kinetics of ternary polymer systems.

Pat Wang (PhD '93, Zimmerman) reports that she finds her position at Hewlett-Packard in Oregon to be rewarding and challenging.

Lars Winther (PD, Zimmerman) wrote from Denmark that they are freezing and it is cold and windy this winter. But he misses Wisconsin snow. Lars is working as project leader at DAKO, a biotech company located outside Copenhagen. He writes "I am developing polymeric enzyme-antibody conjugates for e.g. immuno histochemistry and new general signal amplification systems for diagnostic assays. In this work I am utilizing a lot of organic chemistry, including some of the techniques I learned in your group."





NEW BADGER CHEMISTS

May 1997

JOHN M. BEMIS (DAHL)

"Synthesis and Characterization of Unprecedented High-Nuclearity Platinum, Platinum-Palladium, and Platinum-Nickel Clusters."

XIAOYA DING (WRIGHT)

"Laser Spectroscopy on Fullerene, Fullerene Derivative and Er Endohedrals."

ROBB R. GARDNER (GELLMAN)

"Noncovalent Interactions in Minimal Model Systems: (I) Beta-Hairpin Promotion by a Tetra-Substituted E-Alkene Glycylglycine Mimic. (II) Secondary Hydrogen Bonding Interactions in Beta-Hairpin Formation. (III) Estimating Minimum Increments of the Hydrophobic Effect."

DENNIS G. HANKEN (CORN)

"Synthesis and Spectroscopic Characterization of Novel Self-Assembled Zirconium Phosphonate Multilayer Films on Gold and Silica Surfaces."

ALAN J. KENNAN (WHITLOCK)

"Organic Host Molecules as Enzyme Mimics: Isoxazole ring Opening & Group Transfer."

JOSEPH R. LENNOX (BURKE)

"Progress Toward the Total Synthesis of Rhizoxin D: The C(1)-C(10), C(11)-C(19) and C(20)-C(26a) Subunits."

DAVID D. MANNING (KIESSLING)

"Selectin-Saccharide Interactions of Monovalent and Multivalent Carbohydrate Derivatives."

NEIL MOE (EDIGER)

"Computer Simulations and 13C NMR Studies of Local Polymer Dynamics."

DANIEL M. ROOT (LANDIS)

"Valence Bond Principles Applied to the Molecular Mechanics Description of Molecular Shapes."

FORREST S. SCHULTZ (WEST/ANDERSON-WATER CHEMISTRY)

"Applications of Sol-Gel Derived Ceramic Materials in Organic Chemistry: A Microorganized Medium, Catalyst, Photocatalyst."



WEITANG (SMITH)

"Factors Influencing Nucleic Acid Stability and Ion Formation in Matrix-Assisted Laser Desorption/Ionization (MALDI) Mass Spectrometry."

GAIL M. THORSON (MARTIN) (CRIM)

"Dimethyl Sulfoxide Photodissociation Studies in a Molecular Beam: Determining Photofragment Energy Distributions and Dissociation Pathways."

AREJAS JAMES UZGIRIS (SMITH)

"Flow Cytometric Analysis of Transfected Bacterial Cells."

August 1997

THOMAS BRAUCH (LANDIS)

"Rational Catalyst Design: Characterization Asymmetric Hydrogenation and the Classic Effect in Hydroformylation."

THOMAS CLEVELAND (LANDIS)

"Application of Valence Bond Principles to the Descriptions of Main Group and Transition Metal Shapes."

KATHLEEN M. FIEHRER (NATHANSON)

"Energy and Angle Resolved Uptake of Organic Gases in Concentrated Sulfuric Acid"

MICHAEL C. GIDDINGS (SMITH)

"Computational Methods in Automated DNA Sequencing"

PETER W. GLUNZ (RICH)

"The Synthesis of Computer-Designed Aspartic Protease Inhibitors."

GARY E. MIRACLE (WEST)

"The First Stable 1-Silapropadienes."

JOHN R. NASH (CASEY)

"Synthesis and Reactions of Rhenium Pi-Propargyl Complexes."

ROBERTA R. NAUJOK (CORN)

"Weak Acid Chemistry and Photoisomerization of Azobenzene Surfactants of the Liquid/Liquid Electrochemical Interface by Optical Second Harmonic Generation Spectroscopy."

CHRISTOPHER O'DONNELL (BURKE)

"The Design, Synthesis, and Study of Triamine and Tetramine Macrolides and Their Derivatives."

YU-CHI PAN (DENTON)

"A Study of Plasma Reaction Mechanisms & Kinetics in Glow Discharges of Methyl Methacrylate & Related Precursors Using in situ FTIR Spectroscopy."

JUN SHAN (HAMERS)

"A Surface Infrared Study of Reaction Chemistry During Silicon Chemical Vapor Deposition Processes."

WILLIAM SIKORSKI (REICH)

"Stabilized Organolithium Reagents. I. Regioselectivity of Enone Addition. II. Triple Ions".

December 1997

LAURIE A. CHRISTIANSON (GELLMAN)

"Computational Evaluation of Noncovalent Intersections in Biomimetic Polymers and Small Molecules."

MARTIN J. COFFEY (CRIM)

"A Vibrationally Mediated Photodissociation Study of State Mixing in Jet Cooled Isocyanic Acid".

NATALIE A. DALES (RICH)

"Discovery of Aspartic Acid Protease Inhibitors Using De Novo Design."

CATHY L. DANTZMAN (KIESSLING)

"Synthesis and Reactivity of 2'-Thiol-containing Ribonucleotides."

ERNEST R. FRANK (HAMERS)

"Nano-meter Scale Surface Restructuring of Silver Films Studied by Scanning Tunneling Microscopy."



PETER E. HANSON (GELLMAN)

"Proton Folding Using Molecular Assistants."

CHARLES R. HEAP (BURKE)

"Design and Synthesis of Laterally-functionalized, C-3 Symmetric Macrocycles."

JIAN HONG (BURKE)

"Studies Directed Toward the Total Synthesis of Rhizoxins: The C(1)-C(9) and C(12)-C(26) Subunits."

CLAIRE E. JORDAN (CORN)

"Characterization of Biopolymer Adsorption at Alkanethiol Self-Assembled Monolayer—Modified Gold Surfaces by Surface Plasmon Resonance and PM-FTIRAS."

BARBARA F.M. KIMMICH (LANDIS)

"New Approaches to and Mechanistic Studies of Asymmetric Homogeneous Catalysis."

HONG LI (WEST)

"Synthesis and Properties of Poly(phenyleneethynylenes), Polydialkylsilylenes and Their Copolymers."

MIKE MILLER (WEST)

"1. The Exohedral Modification of Buckminster Fullerene with Si Containing Adducts. 2. The Synthesis and Characterization of Silafullerenes."

CHOONG WOON MOON (BURKE)

"Design, Synthesis, and Study of Triol, Trifuran, and Triacid Triolides."

KATHLEEN H. MORTELL (KIESSLING)

"Interaction of Neoglycopolymers Produced by Aqueous ROMP with A Carbohydrate-binding Protein."

RAYMOND NG (BURKE)

"The Design, Synthesis, and Study of A Hexafuran Macrolide and Claisen Hydropyran Syntheses via A Glycolate Ring-Closing Metathesis Sequence."

JENNIFER M. PACE (BURKE)

"Design and Synthesis of a Triguandine, Trisulfide, C3-Symmetry Macrocyclic."

JEANNIE R. PHILLIPS (BURKE)

"Efforts Toward the Synthesis of the C(1)-C(18)/C(19) Segments of Halichondrin B and Investigation of an Endgame Strategy for its Total Synthesis."

NIKKI L. POHL (KIESSLING)

"Synthesis of Carbohydrate-Based Ligands for the Selectins and Galectins."

PRAKASH RAMAN (RICH)

"Synthesis and On-Resin Cyclization of Cyclosporin Analogs."

STEVEN J. RHYNER (TAYLOR)

"Chemically Amplified Photoresist Development Characterization and Airborne Contaminant Monitoring for X-ray Lithography."

HONGLAE SOHN (WEST)

"New Chemistry of Siloles and Germoles."

MICHAEL E. SOLOMON (RICH)

"The design and Synthesis of Dual Inhibitor Cyclosporin A Conjugates."

JIABING WANG (VEDEJS)

"Studies Toward the Asymmetric Synthesis of Diazonamide A."

JOHN M. WRIGHT (LANDIS)

"Solution Structures of Two Homogeneous, Early Transition-Metal Olefin Polymerization Catalysts."

**May 1997****GARY E. ASPNES (KIESSLING)****DERON W. AUSTIN (WRIGHT)****LOUIS FOGEL (CASEY)****JINGWEN MA (YU)****PAUL D. PRICE (SIBERT)****RUITANG (REICH)****August 1997****ADRIAN HANLEY (SCHRAG)****BRANDY A. HAPTONSTALL**

(GELLMAN)

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(WRIGHT)

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(WITH HONORS)

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The Department relies on the generosity of our friends, alumni and faculty to provide the margin of excellence in our programs. Last year we focused on the building addition and renovation project, and this year we would like to recognize contributors to the other funds that benefit the Chemistry Department. We thank you and all of our contributors for making the improvement of our program possible.

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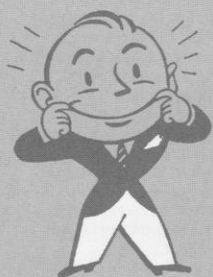
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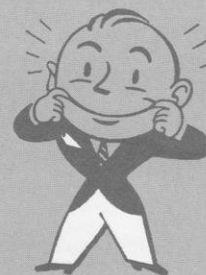
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OUR AWARDS

The Chemistry Department was again well represented among recipients of UW awards.



Gil Nathanson and **Ron Raines** received H. I. Romnes Faculty Fellowships and **Jim Weisshaar** received a WARF Mid-Career Faculty Researcher award. These awards are for the five-year period beginning July 1, 1998. **Mark Ediger**, **Bob Hamers** and **Tom Record** were appointed as Vilas Associates for the next two years. Geology Professor **Jill Banfield**, whom the Department has recommended for an affiliate appointment, received a Romnes Award.

Hyuk Yu was awarded a University Houses named professorship by the University. Hyuk selected Walter H. Stockmayer, his postdoctoral mentor in 1962-63 and "the most influential person in my entire professional career", as the honoree.

Fleming Crim has been named the winner of the 1998 Earle K. Plyler Prize for Molecular Spectroscopy for his studies of chemical reactions at the molecular level. Fleming received the award, consisting of a certificate and \$5,000, at the March meeting of the APS. The citation reads: "For the application of novel and powerful spectroscopic and dynamic techniques to elegantly demonstrate the feasibility of bond-selective photodissociation of molecules, holding the promise of control of chemical reactions by light."

Mark Ediger was named a Fellow in the American Physical Society. The citation reads "For his insightful experimental and computational investigations of local polymer dynamics in solutions and melts."

Ron Raines has been named winner of the 1998 Pfizer Award in Enzyme Chemistry for his work on enzymes important to human health. The award, which recognizes a top chemist under age 40, consists of a medal and a check for \$3,000.

Tom Record received a MERIT Award from the National Institutes of Health. MERIT Awards provide long-term grant support to "investigators who have demonstrated

superior competence and outstanding productivity during their previous research endeavors."

Jim Skinner was named a Fellow in the American Physical Society. The citation reads "For fundamental contributions to the theory of spectroscopy and dynamics in liquids, glasses, and crystals."

The 1997 Pharmacia-Upjohn Excellence in Teaching Awards went to **Sam Gellman** and **Claude Woods**. These awards, presented at the sixth annual awards symposium by **Fleming Crim** and Dr. Jim Freeman from Pharmacia-Upjohn, recognize excellence in graduate and undergraduate teaching in the Department. Sam's talk was titled "Sophomore Organic Chemistry and the Research University", and Claude's talk was "Some Thoughts on the Most Effective Uses of Computer Technology and Student Teaching Evaluations in Chemistry Education".

Student Awards

The fifth annual Hoechst-Celanese Excellence Awards were presented by Dr. Michael Sheehan at an awards colloquium on September 15. Award recipients presented short talks on their research. Awardees included: **John Brady** (BS '90, St. John's U., Casey); **Artis Klapars** (BS '93, University of Latvia, Vedejs); **Robert Lascola** (BS '87, University of Virginia, Wright); **Jingwen Ma** (BS '91, Hefei University of Science and Technology, Yu); and **Ephraim Woods** (BA '93, Transylvania U., Crim).

Two 1997-98 graduate fellowships were awarded in the department: the Lubrizol Fellowship to **Ephraim Woods**; and the Procter and Gamble Fellowship to **Dan Appella** (BA '93, Oberlin, Gellman).

The 1997 Chemistry Teaching Assistant Awards were given to **Tom Cleveland** (BS '91, Landis), **Cassandra Coffey** (BA '92,

DePauw, MS '96, UW-Madison), **Kelly Jetzer** (faculty associate), **Aric Opdahl** (BS '94, UW-Madison, faculty associate), **Faisal Syud** (BA '96, Wabash, Gellman) and **Hieu Tran** (BD '85, U. Hochiminh City, Nelsen). These awards are given every year to Teaching Assistants, and this year for the first time, to Faculty Assistants, who have been selected by students and faculty as outstanding teachers. They were recognized at the Hoechst-Celanese Award Symposium in September.

Paul Bonvallet (BA '96, Kenyon, McMahon) and **Faisal Syud** were selected to serve as 2 of the 18 College of Letters & Science Teaching Assistant Fellows. The Fellows present the L&S TA Training program in August.

Joel Dopke (BS '93, St. Norbert, Gaines) was awarded the Belle Crowe Summer RA in summer 1997. **Rustem Ismagilov** (BS '94, Higher Chem. C. Russia, Nelsen) was named the Dow Fellow.

Amy Ripka, a student of Dan Rich's in Pharmaceutical Chemistry, won an ACS Medicinal Chemistry Fellowship for 1997-98.

David Thompson (BS '88, Carleton, Wright) was awarded the Roger J. Carlson Fellowship in Chemistry. This award is given annually to an Analytical Sciences grad student with an interest and ability in the fundamental physics of chemical measurement.

Undergraduate scholarships presented in 1997-98 were: **Brad Droessler** (Reich) received the Fischer Scholarship; the Weeks Scholarship went to **Paula Gunawan** (Zimmerman); **Katya Varshafsky** (Reich), **Stephanie Spilker** (Essenmacher), and **Cecille Brown** (Zimmerman) were given Reiner Scholarships; **Margaret Ochs** (Nathanson), and **Jessica Birrenkott** (Hamers), **Jeremiah Miller** (Casey), and **Susan Margoni** (Zimmerman) received Helfaer Scholarships.



HARLAN GOERING

Memorial Resolution of the Faculty of the University of Wisconsin-Madison

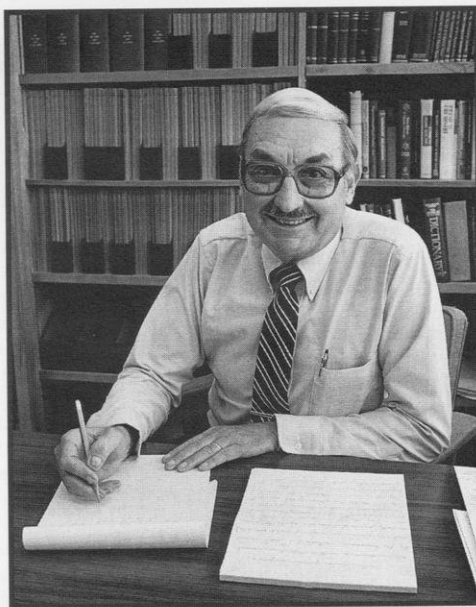
Harlan Goering, Professor Emeritus of Chemistry, died on Oct 28, 1997 in an automobile accident outside of Albuquerque, New Mexico. His passing brought an end to a distinguished career in research, teaching and service to the University of Wisconsin.

Harlan was born on July 13, 1921 in Newton, Kansas, and received his AB degree from Bethel College in 1943. He then started graduate school at the University of Colorado, Boulder. His studies were interrupted when he served in the US Army doing military research at U. S. Radium Corporation as part of the Manhattan Project. At the end of the war he returned to Colorado to resume graduate work and received his PhD in 1948. This was followed by two years of postdoctoral work at UCLA where the new area of Physical Organic Chemistry was flourishing. In 1950 Harlan joined the Department of Chemistry at Wisconsin as an instructor, and was promoted through the ranks of Assistant (1952), Associate (1956) and Full Professor (1959), and finally was appointed McElvain Professor of Chemistry in 1972. He received a senior Alexander van Humboldt Foundation Award in 1974 for study at the University of Saarbrücken, and became Professor Emeritus in 1989.

At Wisconsin Harlan established a distinguished international reputation as one of the preeminent physical organic chemists of his time. His research pioneered the use of stereochemical and isotopic labels for the detailed study of organic reaction mechanisms, initially concentrated on ion pair phenomena, but subsequently extended to various organometallic reactions. In addition to a large body of work on allylic rearrangements, Harlan has published on the stereochemistry and regioselectivity of copper catalyzed cross-coupling reactions, and much fundamental work on addition, substitution and elimination reactions. He pioneered the use of 480 and deuterium labeling for the detection of otherwise invisible reactions, and developed

tools for the measurement of optical activity that are still in wide use today. In all these studies Harlan used well-thought out and elegant approaches to establish fundamental features of many organic reaction mechanisms.

Harlan's high standards for experimental precision and for careful interpretation of data made him an outstanding role model for graduate students and young faculty. After a scientific discussion with Harlan one always came away with a clearer perception of what was known and what was still to be learned. More importantly, one often came away with useful insights for further incisive experiments.



Harlan directed the thesis work of 50 Ph.D. students and 22 postdoctoral associates, and published 117 research articles. He was well-liked by his coworkers, supported them generously, and valued their intellectual input. His teaching was mostly in the area of organic chemistry, both at the graduate and undergraduate level. His students say his lectures were models of organization and precision, and that he had a real knack for crystal-clear explanations of complex concepts.

Harlan played a vital role in maintaining and enhancing the quality and status of the Department of Chemistry. His personal skills of diplomacy and analysis as well as his scientific judgement helped to select and attract to the Department the excellent graduate students and faculty who have maintained and improved its position as one of the top ten chemistry departments in the country. During his tenure as Chair of the Division of Organic Chemistry (1960-1972) there was established a regular Visiting Professor position in organic chemistry which brought "threshold of eminence" scholars to Madison to spend a semester as a member of the faculty. These visitors, over 50 altogether, of which about half were from Germany, also included American, Austrian, Swiss, British, Canadian, and Yugoslavian chemists. They have greatly enriched the life of the Department, and have provided Wisconsin an extraordinary international visibility. Since many of the foreign chemists returned to eventually lead Institutes abroad, the insights they obtained, participating in a thriving American chemistry department like the one at Wisconsin, influenced the way they structured their operations and provided an international educational contribution of an especially significant type.

In addition to his service to the University, Harlan was also active at the national level, having served on the Editorial Board of the Journal of Organic Chemistry, on review panels for the National Science Foundation, as an organizer of the Conference on Reaction Mechanisms, and as Councilor for the American Chemical Society.

Harlan is survived by his wife, Margaret, a son Richard and his wife, Ellen. It is sad to lose a friend and colleague who contributed so much to his family, friends, and profession.

MEMORIAL COMMITTEE

Charles P. Casey
Hans J. Reich, Chair
Howard E. Zimmerman



IN MEMORIAM

ROLLAND A. AUBEY

(BS '49) Died February 13, 1997. He was the Chairman of Business Copy Products, a member of the American Society for Testing and Materials, and a 1985 recipient of the ASTM Award of Merit.

ROBERT H. BAKER

(PhD '40) Died May 15, 1992. Dr. Baker was a retired Professor and Dean at Northwestern University.

JOSEPH F. BEHREND

(BS '35) Died December 1, 1996. Dr. Behrend received his MD in 1950, and was a physician at the Sun Prairie Clinic until his 1985 retirement.

RICHARD R. BOETTCHER

(PhD '70, Berson) Died August 9, 1997 in Lombard, IL. Dr. Boettcher was a research chemist at Sandoz Agro Inc.

ROLLAND R. ETTER

(BS '17) Died September 10, 1994 at the age of 98.

GILBERT W. FAUST

(BS '34, MS '40) Died September 9, 1995. Mr. Faust was a former Registrar at UW-Stevens Point.

E. LEON FOREMAN

(PhD '40, McElvain) Died April 20, 1996 at Asbury Methodist Village, Gaithersburg, MD, at age 86. Dr. Foreman served as research chemist/technical director for several pharmaceutical companies in Arizona and California prior to his retirement.

ROBERT L. FRANK

(MA '38, PhD '40, Adkins) Died in March, 1996. Dr. Frank was Director of Research and Research Vice President at the Morton Salt Company until his retirement in 1976.

HOWARD E. JOHNSON

(PhD '43, Johnson) Died July 30, 1995. Dr. Johnson was a former Senior Industry Analyst at Value Line Inc. He had been a WARF fellow in Chemistry in 1940-41.

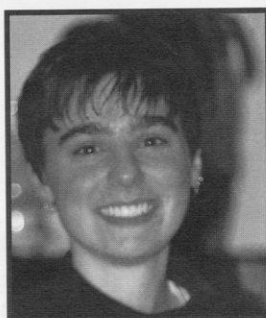
RAYMOND J. KEPFER

(MA '28, PhD '30) Died June 11, 1990. Dr. Kepfer retired in 1962 from his job as a chemist at DuPont.

FREDERICK W. KOERKER

(BS '34, MS '36, Calderwood) Died in June, 1997. Mr. Koerker retired in 1978 after working at Dow Chemical in Quality Assurance.

BETH EMILY MATYSIK



(BS '92, Wright) Died Dec. 22, 1995 in an automobile accident. Beth learned her love of science from her physicist father, and was inspired to become a chemist by her high school teacher. At the time of her death Beth worked as an environmental chemist at NET Labs in Watertown. She loved nature from her earliest years, and was an environmentalist in every sense of the word. She biked constantly, and recycled everything she could. She hiked everywhere, and loved Wisconsin's Kettle Moraine region, the Smokies and the Rocky Mountains. She traveled to Alaska, Ontario, Hawaii, Australia, Puerto Rico, and all over the United States, camping, hiking and biking. She is missed every day by her parents, sisters and numerous friends.

BRUCE N. MCBANE

(MS '41, McElvain) Died May 20, 1997. Mr. McBane was a former Director of Industrial Coatings Development at PPG Industries.

JOHN DAVID MIDDLECAMP

John, age 13, son of **Catherine Hurt Middlecamp** and Ralph Middlecamp, died peacefully at home surrounded by family and friends on April 17, 1997 after a remarkable battle with leukemia. John loved the hours that he spent in the hills of the Baraboo Range, where he talked to the hawks and they would answer. His command of computer games was legendary. During his illness, John lived with a strength and maturity far beyond his years. His sense of humor, affectionate personality, grace, and wisdom will long be remembered by the many friends, young and old, whose lives he touched.

LILA MILLER

(BA '26, MS '27) Died November 18, 1997. Dr. Miller was an Emeritus Professor from the University of Michigan.

VICTOR F. NEU

(BS '31) Died April 16, 1994.

J. BURTON NICHOLS

(MS '24, PhD '28, Mathews) Died May, 1995.

EDWARD JOHN PANEK

(BS '63, Zimmerman) Died June 22, 1997, after a two month illness at age 55. Ed grew up in Madison, Wisconsin and attended the University of Wisconsin, graduating in 1963 with a BS with Honors in Chemistry. He received his Ph.D. from MIT in 1968, working in organometallics under George Whitesides. Following postdoctoral work with Glenn Russell at Iowa State, Ed taught organic and analytical chemistry at Tulane University while continuing research in the organometallic area. Ed joined central R&D of BASF Wyandotte in Michigan in 1975 and worked as a research chemist in special projects and later as Supervisor of Analytical Research. Ed later worked at BASF in New Jersey and in Research Triangle Park, NC. Ed's parents, Edward and Marjorie Panek, still live in Madison.

EDWARD PANEK SUMMER UNDERGRADUATE RESEARCH SCHOLARSHIP

The Chemistry Department, in conjunction with Ed's wife, Dr. Mary Panek, is establishing a fund to provide a summer undergraduate research scholarship to honor Ed. While an undergraduate at UW-Madison, Ed Panek had the opportunity to do undergraduate research with Professor Howard E. Zimmerman, which sparked his interest in a career in chemistry. The purpose of the fund is to extend this opportunity to undergraduates in the future. A current priority of the department is to attract talented undergraduates into careers in chemistry, and undergraduate research experience is a proven method for accomplishing this. If you are interested in contributing to this fund, please send a check to the Department of Chemistry, University of Wisconsin, 1101 University Avenue, Madison, WI 53706 and mention that you'd like to contribute to this memorial to Ed Panek.

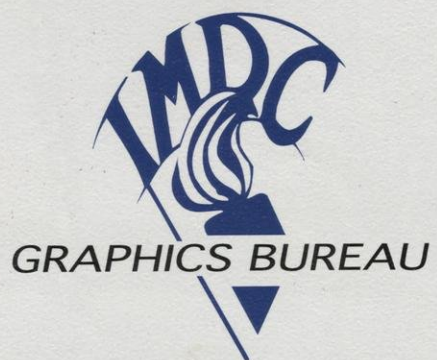
HARRY K. SUTHERLAND

(BS '35) Died February 3, 1993. Mr. Sutherland was a researcher for the Shell Oil Co. until his retirement in 1973.

FRED T. WILLIAMS

(BS '32) Died in March, 1996. Dr. Williams received a PhD in Bacteriology from the University of Wisconsin in 1936.





University of Wisconsin-Madison School of Education