

# CHEM LETTER



## Motley Crew Advised to Keep Their Day Jobs

*Although this group of chemistry faculty and staff were there for the initial dig during last fall's groundbreaking ceremony, they weren't responsible for the first column of the new chemistry building being poured in the wrong place. The problem has since been resolved and these poorly qualified laborers have since hung up their hardhats and returned to their labs. For their identities, turn to page 19. Also see related story on page 3.*

University of  
Washington

Department of  
Chemistry

July 1993

Volume 19

## Chairman's Message

Dear Alumni

Once again the Department of Chemistry has had a productive, successful year. Significant advances have been made on several fronts.

This year saw the introduction of a chemistry help room for the entry level students. Staffed by two Ph.D.-level chemists who each works part-time, the help room operates for about six hours a day and is open to all with questions concerning the freshman chemistry courses. The room is always busy; the crush just before midterms and finals is impressive! Also on the

undergraduate front, our new Associate Chair for Undergraduate Studies, Bill Reinhardt, is conducting an extensive review and revision of our entire undergraduate program. Our idea is to prepare the department for the new problems and issues associated with the 21st century. Bill's review committee includes both undergraduate and graduate students.

One of our most exciting moments came last September, when the ground was broken for our new building. The Bagley annex, which includes both undergraduate and research laboratories, now has its head above the ground and should be occupied starting about one year from now. Meanwhile, this summer we begin the first of a number of renovations of undergraduate laboratories in Bagley.

Once again our faculty obtained recognition at the national and international levels for their fine research. We are particularly pleased with the fact that two people, Jim Callis and Rick Heller, received Guggenheim Fellowships. Only 150 were awarded nationwide to nominees from every field of academe!

This year also saw the deaths of two faculty who had served the department for many years. Rex Robinson was on the faculty from 1929 until 1971; George Cady from 1938 until 1972. Their contributions to the department are described more fully later but I do want to say how much they were admired by their colleagues and former students.

Finally, this year saw the retirement of Barbara Jaeger, who served as secretary to several chairs. Barbara was in the department for 30 years. Her contributions were invaluable. Happy retirement, Barbara!

Best Wishes,



Robert O. Watts



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## CHEM LETTER

Published by the  
Department of Chemistry  
BG-10

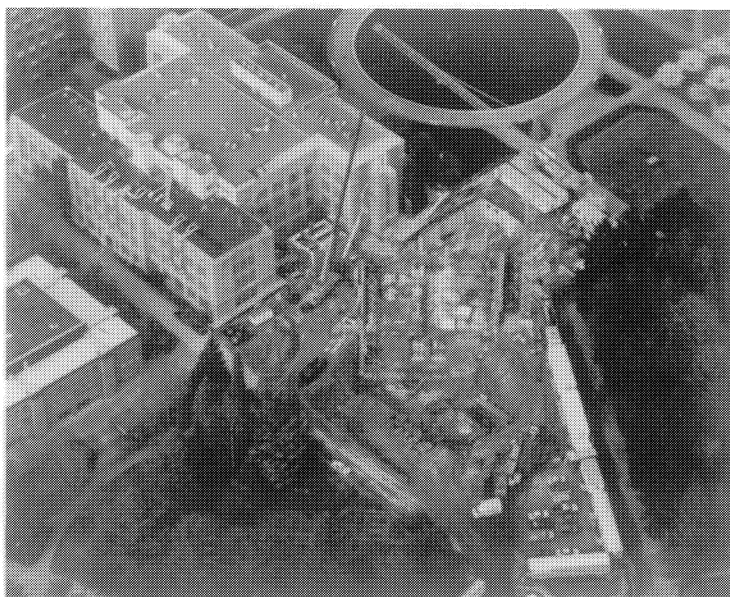
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## Huge Hole to Become Home to Hundreds of Chemists

**S**ince last November's groundbreaking, work proceeds on schedule.

Bagley Hall's southeast corridor will adjoin the new facility. This has meant the temporary relocation of the hazardous chemicals storage area and loading dock to the west side of the building. In addition, a new route for disabled students was created.

Windows in offices on the southeast side of Bagley were plastered over prior to the dismantling of the east stairwell during the week of Spring break. Walkways to the new building will lead into Bagley where the emergency stairway once was. The contractors removed the structure by first sawcutting the stairs from the building and then used a robotic unit with a hydraulic crusher, supported by a crane, to remove them.

After digging thirty feet below ground, contractors reached the University's utility tunnel, which runs throughout campus. The excavated site around the tunnel was so small that a backhoe was

lowered into the pit each morning by a crane and then lifted out at the end of the day. Unexpectedly, the concrete tunnel turned out to be twice as thick as reported by University officials and more time than expected was needed to break through in order to attach gas, water, steam, air, low voltage lights, and communications lines. The emergency feed to University Medical Center had to be shut down for a day for this work to be completed.

Many of the walls and columns have been poured and beams have been erected. While work continues on the new facility, improvements and changes in and around Bagley Hall are also being made. These include site work on both sides of Stevens Way, the installation of a chilled water line around the ground floor corridor, and an upgrade of the first floor corridor. Most of that work will be done on a swing shift in an effort to minimize disruption to ongoing activities in Bagley.

When completed in the fall of 1994, the five-story addition will be over 100,000 square feet and will connect

## UG Curriculum Review Underway

**T**he most comprehensive assessment of the department's undergraduate curricular offerings in the last decade began last quarter under the guidance of Associate Chair for Undergraduate Studies Bill Reinhardt.

In a process that is expected to be completed during this coming fall quarter, Reinhardt has established three subcommittees, comprised of faculty from each of the major chemistry divisions, staff, graduate students, and undergraduates. One group will undertake a complete review of the entire undergraduate program, including requirements for the chemistry and biochemistry degrees, requirements for honors students, non-majors, premedical, and pre dental students. This committee will also examine those chemistry classes which fulfill the College of Arts and Sciences requirements for general education.

Another subcommittee is expected to define and implement an appropriate mechanism to assess the success of current and future programs. One of the components of the process could possibly be a survey of departmental alumni from the last ten years to measure the viability and quality of the education which was received from the students' perspective.

Reinhardt's third group will work to establish the intellectual goals for majors, preprofessional students (such as engineers and prehealth sciences majors), and non-scientists. An honest appraisal of how these goals are met by the current curriculum will be part of this subcommittee's task and may result in either a wholesale restructuring of the present curriculum or, depending on the study's conclusions, refinement an already sound program.

This study is prompted in part by the growth of the department's Division of Chemical Education and the potential for a new way of thinking about the teaching of chemistry.

to Bagley on every floor with totally enclosed walkways. The exception will be on the first floor, where there will be a covered walkway joining the two buildings.

The ground level of the new building will contain physical and analytical chemistry research laboratories, organic teaching laboratories will be on the first floor, and synthetic organic and inorganic research laboratories will be found on the second, third, and fourth floors. There will be a seminar room on the first floor and conference rooms on the middle three floors.



## Student Works to Level the Playing Field

**D**ifferently abled, disabled, or challenged. It doesn't matter what word is used to describe students who rely on wheelchairs for mobility, use canes or dogs because of blindness or low vision, employ interpreters because of hearing impairments, or need extra time on examinations because of learning deficits. Obstacles exist regardless of the label and nowhere do some of these barriers loom larger than in science classrooms.

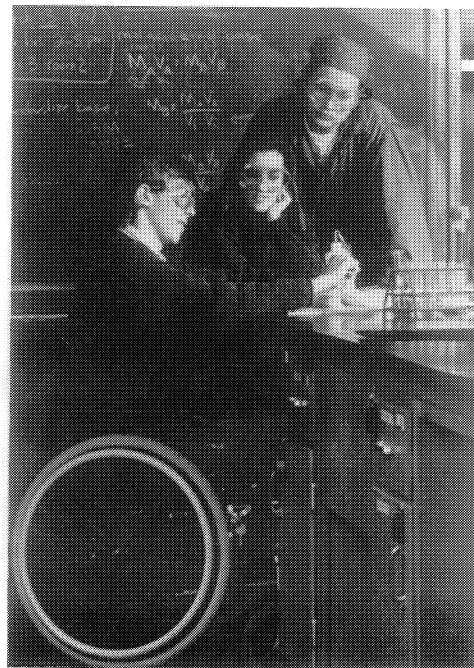
Chemistry graduate student Karl Booksh is actively trying to interest more disabled high school students in science majors and careers through his participation in a National Science Foundation-funded project called DO-IT (Disabilities, Opportunities, Internetworking, and Technology in Science, Engineering, and Mathematics). The UW and NorthWestNet are also supporting the program.

This three-year project is designed to introduce high school sophomores to the world of science through frequent electronic communication and personal contact with practicing scientists and engineers. During its first year, approximately 20 students, mostly from Washington State, have been accepted into the program and outfitted with computers, modems, software, Internet network connections, and when necessary, special adaptive technology, such as voice-activated word processors. A two-week summer camp will be held in August and will be expanded in successive years to bring back original project participants in addition to new students.

Booksh is part of DO-IT's governing board and is unofficially serving as a mentor to a Seattle-area young man who has expressed an interest in science and music. The two email regularly and Booksh has shown this student around the University and Department of Chemistry. During the summer camp, Booksh is going to serve as an instructor.

It was because of his work on a UW advisory committee which is concerned with providing and maintaining physical access to campus facilities for disabled students that Booksh came to the attention of Sheryl Burgstahler, DO-IT's director and head of the UW microcomputers program. Establishing entry into all buildings for disabled students is the group's first priority, followed by the recommendation that resources be spent to improve the facilities in these buildings, such as bathrooms and elevators. Booksh's committee has also recommended that curb cuts be conspicuously painted so that delivery vehicles, among others, don't park in front of them. This last idea has so far been overruled by another campus committee which fears that campus aesthetics will be compromised if the curb cuts are somehow illuminated.

Booksh, who is completing his third year of graduate study at the UW, just received a graduate fellowship for the next academic year from the



American Chemical Society's Division of Analytical Chemistry. His work in chemometrics is supervised by Bruce Kowalski and after he receives his Ph.D., Booksh would like to teach at a small college.



### Top Seniors Recognized

Senior award winners were selected by a committee of faculty and staff who considered such factors as cumulative grade point average, grade averages in major courses, research record, departmental service, outside employment and activities, and professional goals.

From left are American Institute of Chemists (AIC) winner Chris Stork, Merck Index award winners Alexandru Bageac and Elizabeth Haswell, and Tom Nguyen, another AIC award winner. Ken Brameld, the third Merck award recipient who graduated early with a chemistry degree, was unable to join the rest of the students as he was trekking in Nepal. Brameld begins chemistry graduate school this fall at CalTech.

Also set to travel is Haswell, who plans to tour Europe for six months before starting biochemistry graduate school. She has worked for the last three years in a botany professor's laboratory

## Dentist Brushes Up On His Biochemistry

**A** scholar and a gentleman. Two more fitting adjectives may not exist to describe Ian Hamilton, an undergraduate biochemistry major and emeritus professor of restorative and operative dentistry.

This degree program is the 78 year-old Hamilton's fourth disparate field of study. He received his dental doctorate with honors from the University of Toronto in 1936. After short stints in private practice first in Winnipeg and later in Victoria, he came to the UW in 1949 as an instructor. Taking courses part-time while he worked full-time, Hamilton earned a 1953 bachelor's and 1958 master's degree in economics. Economics was an area he developed an interest in while taking correspondence courses during his war service years in the Canadian Dental Corps while stationed in Southern England.

Hamilton worked his way up through the academic ranks but quit his UW associate professorship in 1962 to return to England to pursue a doctorate in anatomy at the University of London. He and his

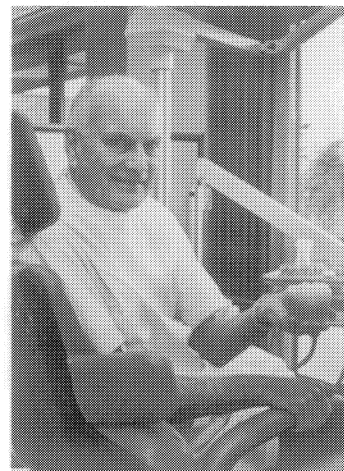
wife had spent 1959 there on sabbatical - Hamilton received the first UW dental school sabbatical - and even though the UW would not guarantee that his job would be waiting for him upon his return, Hamilton spent the next six years studying the rates of generation of cells in diabetic rats while he worked part-time in the Department of Oral Anatomy at the Royal Dental Hospital of London. In exchange for his service at the dental school, Hamilton was not charged tuition for his Ph.D. Hamilton's dissertation showed that the rate of cell generation was slower in diabetic than in normal rats. He was 45 years old when he finished his doctorate.

Timing was on his side, and Hamilton was offered a full professorship when he returned to the UW from England in 1968. Twice he has received the Outstanding Instructor Award from the dental school graduating classes of 1959 and 1987. Hamilton was asked to be the commencement speaker by the graduating class of 1986, an honor almost denied him by the then dean of the dental school. Hamilton was known to be dissatisfied with the trends in academic dentistry and

dental school administrators were reluctant to give Hamilton such a public platform. In the end, however, the students insisted and Hamilton was given 10 minutes to talk. He took 15.

During his academic career, Hamilton specialized in gold foils. He's active in several dental study clubs, and meets monthly with the local gold foil group. He serves as a recorder while gold foil operations are performed by a handful of dentists during the day and then at night, he critiques the work at a group meeting. In 1972, Hamilton was president of the American Academy of Gold Foil Operators and served as the 1977 secretary and 1979 chairman of the American Association of Dental Schools Section on Operative Dentistry.

In the classroom, not only does being a near octogenarian set him apart from his fellow students. Hamilton comes to school every day dressed like an investment banker and at the beginning of quarters, is often mistaken for the professor as he waits in the hall for class to begin. However, Hamilton has become



close to the other students and often studies with them. Chemistry has changed since his pre-dental days during the Depression. Neutrons had only just been discovered and they weren't yet incorporated into classroom lectures.

Hamilton retired in 1986 and gave up his 10 year editorship of *Operative Dentistry* at the same time. In his own words, he plans to do graduate work at the "University of the Hereafter" when he finishes up this program.



and has also done undergraduate research in the biochemistry department. Haswell is a fourth-generation member of Phi Beta Kappa and she is the recipient of a UW Presidential scholarship, National Merit scholarship, two Arts and Sciences Honors scholarships, and a SeaFirst Bank Scholar Excellence award. Haswell has been a peer adviser for the Freshman Interest Group program and her degree is in biochemistry.

Alexandru Bageac has served as the first president of the Free Radicals, the club for undergraduate chemistry and biochemistry majors. Bageac's mother escaped from Romania in 1987 and eventually made her way to the United States. Two years later she was able to bring her only child to America, and now he is set to begin medical school this fall at Harvard. As the top student in the physical chemistry series during his junior year, Bageac received the P. C. Cross prize. He has also been the recipient of an undergraduate tuition scholarship from the department. Bageac has done undergraduate research in molecular reproductive physiology and he has been a chemistry teaching assistant for the last year.

Tom Nguyen is another student who came to America in search of a better life. When he escaped from Viet Nam in 1983, he arrived alone in America, unable to speak English. This fall, Nguyen is also set to begin medical school. He is a biochemistry and chemistry major who has been the recipient of awards for the top student in the honors first- and second-year general and organic chemistry series, as well as the recipient of a departmental undergraduate tuition scholarship and a UW Undergraduate Scholars award. Nguyen has played the piano in his church choir for the last three years and he has done undergraduate research with organic chemistry Professor Heinz Floss for two years.

Stork majored in biochemistry and conducted research with analytical chemistry Professor Rob Synovec. After taking next year off to work, Stork plans to enter graduate school in either biochemistry or analytical chemistry. He was a four-year Washington Scholar, a legislatively-sponsored tuition waiver program for outstanding students.

## Bagley Briefs

### UG Research Symposium

The Chemical Reactionaries and the Free Radicals joined forces again for the second annual undergraduate research symposium, which attracted ten presenters last May. Students of at least junior standing, with majors in chemistry or biochemistry, gave short talks before a group of faculty, graduate students, and other undergraduates during the day-long event. Each speaker was given a gift certificate to the University Book Store for their efforts and the Department of Chemistry hosted a luncheon for all those in attendance.

The Chemical Reactionaries is the name of the chemistry graduate student organization and the Free Radicals is its undergraduate counterpart.

### Science Outreach Day

More than 70 Washington high school science teachers and students recently attended the department's second Science Outreach Day.

Held as part of a larger outreach program designed to recruit young people into scientific majors once they enter college, the day combined talks by faculty from a variety of scientific disciplines with tours at such places as the Nuclear Physics Laboratory, wind and water tunnels and the RAM accelerator in the Department of Aeronautics and Astronautics, the positron emission tomography imaging laboratory in the Department of Radiology, the Department of Geophysics' Seismology Monitoring Laboratory, an underwater volcano laboratory in the Department of Oceanography, the infant primate laboratory in the health sciences complex, and a virtual reality laboratory at the Washington Technology Center. Synthetic bioorganic chemistry, NMR, laser, and mass spectroscopy laboratories in the Department of Chemistry served as additional tour sites.

Among the featured speakers was the chair of the Department of

Astronomy who is a member of the team which designed and now operates the Hubble Space Telescope. Chemistry Professor William H. Zoller was the luncheon keynote speaker and Professor Darrell J. Woodman gave a computer graphics presentation.

### Graduates Feted at Lunch

The culmination of many years of hard work for scores of students was recognized during the department's fourth annual commencement luncheon. The front lobby of Bagley Hall was transformed into a formal setting as over 100 students and their families were hosted at a function designed to honor the department's graduates during the past year.

The gathering was held immediately after the formal commencement ceremony. The department had more than 80 students receive bachelor's degrees in chemistry and/or biochemistry, 21 students earned master's degrees, and 23 students graduated with doctoral degrees. Seventeen of the MS graduates remained in the department to continue studies toward their Ph.D. degrees.

### HS Teachers Summer Institute

For the ninth consecutive summer, high school chemistry teachers from across a seven state region will once again have the opportunity to attend a month-long program designed to expand their laboratory skills and knowledge of environmental chemistry.

The program's director, Professor Darrell J. Woodman, and the featured lecturer, Professor Norman J. Rose, will build on the success of previous institutes in which Woodman augmented the instructional lecture/lab format with participant presentations and guest lecturers from other science departments on campus.

This year's institute is funded through grants from the National Science Foundation, the State of Washington, the Environmental



Fourth-year graduate student Paul Schomber demonstrates the wavelength selectivity of lasers to high school students and teachers at Science Outreach Day. He passes a beam from a krypton ion laser through a red balloon which then pops the blue balloon inside.



Research Scientist Jim Roe explains the operation of the mass spectrometer source during Science Outreach Day.

Education and Training Foundation, Inc., the Discuren Foundation, and the Chevron Research Company. Woodman also coordinates the chemistry portion of an academic year state-sponsored program for teachers, Science Enhancement for Teachers (SET).

### Chemistry Computer Graphics

Professor Darrell J. Woodman has launched another educational enhancement project with the creation of over three dozen separate computer graphics presentations which more than a dozen faculty

are currently showing in their lecture courses on a video projector.

Woodman has designed a series of Supercard presentations, using images imported from MacMolecule, Chem 3D Plus, MolDraw, Super 3D, and Morph, by which complex 3D spatial relationships, molecular structures, reactions, and dynamic processes are demonstrated.

Woodman's animations include organic reaction mechanisms and molecular dynamics. Molecular and orbital models are used in topics as diverse as nylon, states of matter,

hybridization, forms of carbon, waves and nodes in 1-, 2-, and 3D, cubic crystal systems, and organic conformation. He has plans to expand this project into other areas.

### Student Outreach

Professor William H. Zoller's nationally recognized project which teaches college students to give talks to high school students in science classes about environmental issues such as ozone depletion, NASA and the environmental impact of the space shuttle flights, Chernobyl nuclear accident, and the greenhouse effect is completing its third highly successful year.

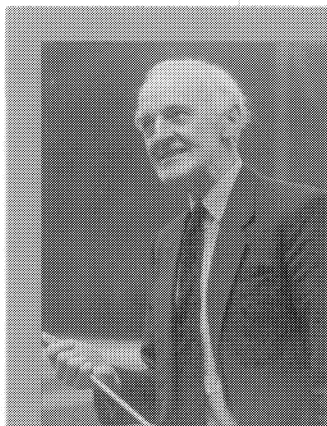
The students have been able to speak at about 20 schools per academic year, often giving more than one presentation per visit. The students' efforts have thus far been voluntary, but there are plans to create a special course for this outreach activity which students could use as elective credit.

All costs for the program have either been borne by Zoller or the Department of Chemistry. The Environmental Protection Agency has recently agreed to fund the students' travel costs for future trips.

### Summer UG Research Awards

The department has received a second multi-year site grant from the National Science Foundation Research Experiences for Undergraduates (REU) program. Project Director Darrell J. Woodman reports that the grant will continue the activity begun under the original award three years ago. Ten undergraduates from the UW and elsewhere will do research with departmental faculty. Stipends and modest other support are provided and the students receive academic credit for their work. One aspect of the program is the weekly seminar series, where the student participants talk about their respective projects, in addition to their research groups' activities.

(continued on page 20)



### Buckingham Delivers Cross Lecture

"Structure and Properties of Van Der Waals Molecules" was the subject of David Buckingham's talk last Autumn Quarter. Buckingham, who is an internationally recognized scholar in the areas of intermolecular forces and the optical, electrical, and magnetic properties of molecules, is professor of chemistry at Cambridge University. He's been a Fellow of the Royal Society for nearly 20 years and was named as a Foreign Associate of the National Academy of Sciences last year. Buckingham has published more than 260 papers.

Paul C. Cross was a distinguished member of the physical chemistry faculty and chair of the department from 1949 until 1961, when he left to become the president of the Mellon Institute.



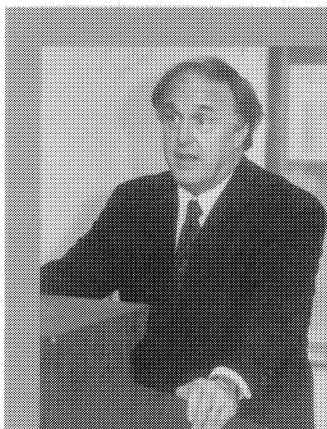
### First Cady Lecture Presented by Former Student

As one of the primary organizers of the George H. Cady Lecture Fund honoring her former research supervisor, Jean'ne Shreeve was a logical choice to present the first Cady Lecture last February.

Shreeve is an internationally recognized expert in fluorine chemistry. The major emphasis of her work has been synthesis, characterization, and reactions of fluorine compounds containing nitrogen, sulfur, and phosphorus. She's been the recipient of the many awards, including a 1970 Alfred P. Sloan Foundation Fellowship, the 1972 ACS Garvan Medal for Outstanding Women Chemists, a 1975 Outstanding Achievement Award from the University of Minnesota, from where she received her master's degree, an ACS award in 1978 for Creative Work in Fluorine Chemistry, a College Chemistry Teaching Award in 1979 from the Manufacturing Chemists Association, and the Harry and Carol Mosher Award of the Santa Clara Valley ACS Section in 1991.

Shreeve's dissertation was completed in 1961 and she began working that same year at the University of Idaho. She served as head of the Chemistry Department there from 1973 until 1987, at which time she was appointed vice provost for research and graduate studies, a position she continues to hold.

Her Cady Lecture was entitled "Synthesis of Fluorinated Molecules Using Silylated or Metallated Precursors."



### Scripps President is Dauben Lecturer

A pioneer in the development of methods for the preparation for site-specific antibodies delivered the 16th Hyp J. Dauben lecture in May.

Richard A. Lerner is the Lita Annenberg Hazen Professor of Immunochemistry and president of the Scripps Research Institute in La Jolla, California. His talk on "Antibodies by Chemistry" was presented as part of the annual lecture series established to honor the late Dauben, a noted member of the organic chemistry faculty from 1945 until 1968.

Lerner, a medical doctor by training, was among the first to develop a practical process for eliciting antibodies that catalyze a preselected chemical reaction. These "catalytic antibodies" have the potential to revolutionize the process by which chemists accomplish highly selective chemical transformations.

The author of more than 250 papers, Lerner is a Cope Scholar, as well as an elected member of the Royal Swedish Academy of Sciences USA and the National Academy of Sciences.

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## Donations Continue to Fund Vital Departmental Activities

The following individuals, corporations, and foundations donated to the Department of Chemistry between July 1992 and the end of April 1993. Development committee Chair Charlie Campbell expresses appreciation on behalf of the department for the generous support of all its donors. He urges people to call him collect at 206-543-3287 if any gifts were omitted from this list or if names have been inadvertently misspelled. Campbell would also like to point out that Professors B. Seymour Rabinovitch, Martin Gouterman, Paul B. Hopkins, and Yeshayau Pocker were not included in last year's list because their donations were made directly to the college's matching program for faculty and were not passed onto the department before last year's CHEM LETTER was published.

### OVER \$10,000

Allied-Signal, Inc.  
American Chemical Society  
Carlsberg Research Center  
Chevron Research & Tech.  
Company  
Exxon Chemical Americas  
IBM Corporation  
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Company, Inc.  
Nist, Bernard J.  
Parke-Davis  
Saegebarth, Klaus Arthur  
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### \$5,000 - \$9,999

Dow Chemical Company  
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### \$1,000 - \$4,999

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Ritter, Bernice C.  
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Teeter, Richard M.  
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Zoller, William H.

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Ritter, Daniel B.  
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Barany, John Stephen  
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Ben, Victor R.  
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Berkelhammer, Gerald  
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Blase, Nancy G.  
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Harms, Nancy S.  
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Heilman, Robert B.  
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Hogue, Philip N.  
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Hopkins, V. Adele  
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Hyman, John Emery  
Ikeda, Daniel Phillip  
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Israel, Arthur C.  
Johnson, Edwin Lee  
Joss, Jonathan Edward  
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Leung, Yan Louis  
Lewis, William C.  
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Lory, Earl R.  
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Lund, John T.  
Lund, Theodore G.  
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MacDonald, Bruce Guy  
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Matsumoto, Alvin M.  
May, Joan T.  
McCarthy, Joseph L.  
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Metzger, Robin A.  
Miller, Alex E.  
Minor, James Ernest  
Morrow, Gerald E.  
Moulton, R. Wells  
Muhs, Merrill Arthur  
Naf, Edwin O.  
Natt, John J.  
Neff, Loren Lee  
Noftle, Ronald Edward  
Numata, Robert Alan  
O'Loughlin, John Fitzgerald  
O'Toole, Cynthia Ann  
Oliphant, Betty E.  
Oleman, Elizabeth A.  
Ordal, Lorna L.  
Osborne, Allan Gilbert  
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Spitzer, Kenneth D.  
Stein, John Egil  
Stenkamp, Ronald Eugene  
Steunenberg, Robert K.  
Stogsdill, Rose M.  
Strang, Allan Gene  
Strasser, David William  
Strelitzer, Oscar E.  
Suzuki, Edward M.  
Sweeney, William Alan  
Symonds, Marylyn E.  
Theodore, Louis James  
Thornton, Marilyn A.  
Tracy, Joseph Walter  
Underwood, Bruce Kenneth  
Van Roekel, Linda R.  
Van Zandt, Thomas L.  
VanMeter, Wayne Paul  
Varanasi, Usha S.  
Vincow, Gershon  
Virant, Frank S.  
Vonbacho, Elizabeth L.  
Wanttaja, Lisa G.  
Warren, John Lawrence  
Webster, Frances A.  
Webster, Grant A.  
Weinstein, Michael Simon  
White, Danny Vincent  
Wilkie, Richard Francis  
Wilkinson, William C.  
Yates, Ronald Lee  
Yoshimura, Arthur A.  
Young, James Allen  
Yum, Tai Yong



## Fellows Honored for Scholarship and Teaching

Recipients of national, university, and departmental fellowships and prizes were recognized during last fall's new graduate student orientation week and more recently, at an awards dinner which also publicly acknowledged the donors and sponsors of these honors (see photographs on page 12).

In the top row from left are Cy Pollema (Dow Fellow), Stacia Rink (Boris Weinstein Fellowship and Biotechnology Training Grant awardee), John Stringer (Graduate School Fellow), Debbie Mattiello (George Hitchings Fellow), Alex Goldstein (Battelle/Pacific Northwest Laboratory/NORCUS Fellow), Tina Gatlin (Chevron Fellow), Bill Cusworth (AMOCO Fellow), and Geeng-Fu Jang (George Hitchings Fellow). Pictured from left in the bottom row are Rick Geier (NCAA, ARCS, and Hertz Foundation Fellow and a Biotechnology Training Grant awardee), Brian

Anderson (Security Pacific Bank Fellow), Chair Bob Watts, Tom Luther (Graduate School Fellow), Gordon Hogenson (Howard Ringold Fellow), Nat Schaeffe (Outstanding Teaching Assistant Prize co-winner) and Steve Alley (Outstanding Teaching Assistant Prize co-winner and Biotechnology Training Grant awardee), and Hui Tong.

## Eradication of Cancer Endowment's Goal

**T**he wife of emeritus chemistry lecturer Barney Nist recently lost her battle with cancer. In her memory, Nist has established an endowment to enhance investigations into basic molecular chemistry that might support medical research efforts to find a cure for cancer and other oncological diseases.

The purpose of this endowed fund is to provide research support and fellowships in the Department of Chemistry with preference for supporting cell structure studies. Chemistry's chairs will have the administrative responsibility for the fund and will determine how income will be allocated and which criteria will be used to select Nist fellows. Depending on the availability of funds, the fellowship will cover items such as tuition, student operating fees, books, and provide a stipend.

Claudine Nist started working as a UW medical school researcher in 1956. Her career lasted 27 years and during part of that time, she worked for Professor Robert Williams, founding chair of the Department of Medicine. For 18 years, she worked with Professor John Ensinn, director of the Clinical Research Center at the UW Medical Center.

Nist has been a fixture of Bagley Hall since the 1940s when he started as a chemistry undergraduate. He returned in 1948 as a staff member after an industrial job devoted to the war effort. In 1962, he earned his master's degree with former UW professor Kenneth Wiberg and was instrumental in the development of the senior-level spectroscopy laboratory. Nist eventually was made permanent lecturer in the course and continued in this capacity until his retirement in 1982.

Travel and photography were two hobbies which the Nists shared. In the years since Nist's retirement, he and his wife travelled to the east African country of Tanzania, Alaska, Japan, Hong Kong, China, New Zealand, Australia, and the South Pacific islands of Bora Bora, Tahiti, Fiji, and Moorea. While his wife's photographs were mainly used to chronicle the trips for their private collection, Nist regularly displays his slides at the UW Faculty Club, Pacific Science Center, and various senior citizen centers. Since his retirement, Nist has provided a changing exhibit of nature photographs in the main chemistry office.

Nist's slides have been used in several books and magazines. In addition to coauthoring an illustrated book depicting the seashores of the Pacific Northwest (*Living Shores*) and serving as the

primary photographer for *Pacific Search* (now *Pacific Northwest Magazine*), Nist has sold his photographs to travel agencies for use in brochures, to R.E.I., to companies for calendars, and to businesses producing children's learning games such as flash cards. In his will, Nist is leaving his collection of more than 50,000 nature and wildlife slides to the Woodland Park Zoo.



## Fellowship Established In Gratitude for Earlier Support

Following his decision to donate the money to create an endowed graduate student fellowship a "no brainer," 1957 doctoral alumnus Klaus Saegebarth has incorporated Du Pont's motto "Better Things for Better Living Through Chemistry" as a goal he hopes Saegebarth fellows will strive for.

It's not surprising that Saegebarth, who earned his bachelor's degree at the University of California, Berkeley, chose Du Pont's credo as a part of the language for his fellowship agreement. The German native, who came to the United States at the age of three in 1932, rose through the scientific and managerial ranks at the giant multinational company. He retired in January 1992 as the vice president and head of research and development in the textile fibers department, the company's largest and most profitable section.

It was also the sale of Du Pont stock which funded the new fellowship. Knowing that his contribution would be matched by the College of Arts and Sciences, thereby doubling the value of the endowment, was one of the factors which cinched the decision for Saegebarth.

The other issue which prompted him to establish this fellowship is memory of a special fund set up by another former UW student to support summer research for graduate students in need. Saegebarth benefitted from this money during his graduate school years and always had in the back of his mind the decision to repay the kindness. Coincidentally, this student, Sam Baker, went on to also become a vice president at Du Pont.

Some of Saegebarth's earlier assignments at Du Pont included the directorship of research and

development for the fabrics and finishes department and serving as head of the agricultural research and development division in the agricultural products department.

However, he characterizes his very last task as his toughest: picking his successor. Worldwide competitiveness is critical to his company's success and there is no room for corporate complacency. After Saegebarth had been in the position about 18 months, he understood what work needed to be done in order to maintain a global advantage. However, Du Pont has a policy of mandatory retirement at 65 for vice presidents in policy making positions. At 63, Saegebarth knew he needed more time than he would have to institute some of his business decisions and rather than wait out the last two years in a job where his credibility might be questioned, he chose to actively work toward bringing in a younger person who could stay the course.

Saegebarth is enjoying retirement to its fullest. He and his wife of 40 years, Mary Ann, have gone on an African photographic safari, spent three weeks in China, and cruised through Latin America on a special expedition with professional naturalists. They have travelled across the United States, spent time at their second home on Florida's Sanibel Island, and played with their four grandchildren. The Saegebarths have three children.

The Saegebarths have also established an endowed prize in chemistry at the University of California, Berkeley, in memory of his parents, and an endowed scholarship for a worthy junior or senior in the College of Education at the University of Nevada, Reno, Mary Ann Saegebarth's alma mater. The endowment he recently set up at the UW is expected to annually augment the stipends of two entering graduate students.

## Mindlin Brothers' Memory Honored by Fellowship

Catherine Mindlin Reinleitner describes her father and two uncles as children of turn of the century Russian and German immigrants who were proud to have become successful Americans. Because the family had the foresight to come to America when they did, the next generation of Mindlins had the opportunity to become financially secure. They saw education as the road to this security. Thus, as they were able, the Mindlins made funds available to help others achieve the educational advantages that they felt had so materially contributed to their success.

Reinleitner has extended this philanthropy by donating funds to create scholarships and prizes to reward academic excellence. For the last several years, Reinleitner has been endowing such prizes and fellowships at universities that her family has attended as a way of thanking the scholarly community. Recently, money she has donated to the Department of Chemistry was endowed as a graduate fellowship and she plans an undergraduate prize for "Creativity in the Sciences" like the ones already in existence at Harvey Mudd College and Columbia and Harvard universities.

Dr. Reinleitner developed an interest in surface and materials science when she became a partner in an analytical chemistry laboratory. She has no formal ties to the Department of Chemistry, but maintains a layman's interest in its achievements. Her own doctorate is in psychology from the University of Washington. She received her bachelor's and master's degrees in history from Columbia University.

Eugene Mindlin, Reinleitner's father, received his degree at the age of 18, also from Columbia University, where he majored in civil engineering. Too young to be admitted to Harvard for graduate school, he worked in the construction trades in New York City. At 22, he was graduated in the first MBA class at Harvard. Building became his life's work for the next 62 years. It is because of his ability to turn dreams into cash assets that the Mindlin Foundation has been made possible.

Two other Mindlin brothers also achieved renown in their own fields. Raymond D. Mindlin was James Kipp Finch Professor of Civil Engineering at Columbia University. He was part of the Manhattan Project and after World War II, he received the highest civilian medal awarded in the United States for his invention of the proximity fuse, which is still used in military applications. Rowland Mindlin graduated from Harvard Medical School and later returned for a master's degree in epidemiology. He had a rewarding career as a pediatrician and later as a hospital administrator.

Reinleitner is interested in non-linear approaches to scientific problem solving. With these funds, she hopes to encourage young men and women to turn their talents toward finding creative scientific solutions to the problems that beset the world.



## Peripatetic Alum Establishes Fellowship

■ scientist who cared about the environment before it was politically correct, a world traveller who has seen some countries not even heard of by many, and now a philanthropist of major proportions. All describe 1939 Ph.D. graduate Lloyd E. West.

West earned his undergraduate degree at Nebraska's Doane College in 1929. He taught at Oregon State University for five years after finishing his Ph.D. at the UW in analytical chemistry with the late Professor Rex Robinson. West also worked on the Manhattan Project at the University of Chicago and later at the Oak Ridge Tennessee facility.

Remembering the long and hard hours he invested to earn his Ph.D., West has recently established an endowed fellowship to help other graduate students with their educational pursuits in much the same manner he was helped by a similar award from the department. West wants to give something back to the university which provided him the opportunity to develop such a distinguished career and rewarding life. West Fellows will have their regular salaries augmented by considerably more than the monthly \$55 he received as a graduate student, however.

It was at Eastman Kodak in the Photographic Technology Division where West spent most of his entire professional career and devoted much of his energy toward the development of analytical testing methods to standardize and improve color film processing. He was also active in the adoption of rigorous national standards to protect the environment from photographic waste products. As a supervisor at the industry giant, West was responsible for the work which went into determining if the chemicals in a waste stream were biodegradable. He oversaw the efforts which then concentrated on either extracting the hazardous chemicals before discharge into the environment or treating them so

that upon release, they did not exceed the pollution limits West lobbied vigorously to lower over the years.

West's photographic expertise has been a factor in his private life, as well. He used his annual month vacation during his work years to see the world and along the way, assembled slide travelogues worthy of professional note. Continuing his journeys beyond his 1973 retirement, he and his wife of 62 years, Florence, have travelled in 85 countries and all 50 states.

West had trouble convincing his colleagues back in the 1960s that ecological issues were important, but he was determined to work with professional societies to create standards for the maximum level of waste stream contaminants. For years, he wrote papers and gave seminars in support of his environmentally provocative views at meetings of the American National Standards Institute. Eventually, his skeptics were won over. Three years ago, the National Association of Photographic Manufacturers (NAPM) presented West with a Leadership Award for his pioneering work in the field of pollution abatement.

Some photographic processes require the use of ferricyanide bleach. West's patent for bleach regeneration using persulfate became standard throughout the industry. It not only saved money, it minimized the volume and toxicity of waste.

The Wests have recently moved to a life-care facility in Oregon, where he is taking steps to establish a community photo processing lab. The octogenarian's other activities include riding his mountain bike and hiking. Mrs. West was honored for her outstanding work as head librarian at their previous retirement center. The Wests' daughter is an office administrator for a large law firm in San Francisco and their son manages a tropical farm in Ecuador.

## Despite National Economy CPAC Expands

■ he Center for Process Analytical Chemistry (CPAC) has gone through a period of economic uncertainty during the last year and has emerged with an additional focus and a handful of new corporate sponsors.

The 10-year old consortium of private and public enterprise is staking out an increasingly stronger position in the area of technology transfer and many of its new members are what CPAC Executive Director Eugene Weissman refers to as "vendors." While maintaining its basic research thrust, the NSF-sponsored center is attracting more companies which are manufacturing oriented, with the express goal of accelerating technology deployment.

CPAC has also expanded the number and type of focus groups for its members. Currently, the center oversees activities in the areas of

- chemicals and materials (sampling, process, and environmental)
- food, consumer products, pharmaceuticals, and biotechnology
- oil and petrochemicals
- chemometrics
- flow injection analysis
- chromatography
- mass spectroscopy
- sensors
- optical spectroscopy

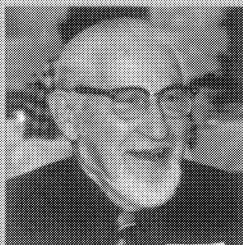
These focus, or interest, groups represent a grassroots effort among the members to establish smaller collaborations of industrial sponsors sharing common concerns in specific areas.

Funding requests for the coming year were discussed at CPAC's annual spring meeting this past May. The budget submitted by the research project directors asked that 11% of CPAC's \$1.6 million operating budget be allocated to the various focus groups, 7% to research in flow injection analysis, 7% to research in chromatography, 9% to research in mass spectroscopy, 11% to work in optical spectroscopy, 42% to work in sensors, 7% to the study of chemometrics, and 6% to be kept in reserve.

The majority of the four-day meeting was devoted to scientific presentations. Approximately 15 chemistry graduate students gave talks on optical waveguide sensors, process chromatography, FIA for process control, continuous monitoring of bioprocesses, process chemometrics, process mass spectrometry, spectroscopic instrumentation, and interdisciplinary polymerization process monitoring. In addition, more than a half dozen chemistry faculty gave talks or served as session moderators during the meeting, which was attended by approximately 200 people.



## Donor Dinner Guests



Bernard (Barney) J. Nist was the instructor of the senior-level spectroscopy laboratory for many years. He recently endowed a fellowship in memory of his wife, who died last fall (see page 9 for article).



Florence M. West, left, and Roberta K. Lingafelter were pictured together at the donor dinner. The Wests established an endowed fellowship for graduate students in memory of Lloyd West's research mentor, the late Professor Rex Robinson (see page 11 for article). Mrs. Lingafelter is the wife of Emeritus Professor Edward C. Lingafelter, a physical chemist on the faculty from 1939 until his retirement in 1984.



Pictured from left are Randall E. Hamm and Vivian M. Hamm, Lloyd E. West and Professor Leon J. Slutsky. Hamm received his 1940 Ph.D. under Tommy Thompson's direction and prior to his 1978 retirement, was a professor of chemistry at Washington State University for 16 years. West, a 1939 Ph.D. alumnus, is featured on page 11 in an article describing the fellowship he and his wife recently endowed for chemistry graduate students. Slutsky, a physical chemist and a member of the faculty since 1961, is also associate chair for graduate studies.



Seated clockwise from the bottom left of the picture are Lynn McInnes, William H. Zoller, Gilson H. Rohrback, D. Michael Heinekey, Gary D. Christian, Thomas Luther, Frances K. and James J. Tazuma, and Vivian Zoller. Bill Zoller, Heinekey, and Christian are, respectively, professors of environmental, inorganic, and analytical chemistry. McInnes, a third-year environmental graduate student, recently won an award from the American Geophysical Union. Luther is a second-year inorganic graduate student and was a recipient last year of a Graduate School Fellowship. Rohrback, a 1942 B.S. and 1949 Ph.D. chemistry graduate with George Cady, is working as a consultant in electrochemistry and corrosion. He has started three businesses since his graduate school days: a software programming company, a corporation dealing with specialty chemicals for the petroleum industry, and a business specializing in corrosion control and measurement for process industries. James Tazuma earned his bachelor's degree in chemistry in 1948 and received his Ph.D. five years later working with Arthur G. Anderson. Tazuma spent the majority of his professional career with Goodyear Tire and Rubber Company as a rubber chemist. He and his wife returned to their hometown Seattle five years ago after retiring from the Akron, OH company in 1985.

Undergraduate chemistry major Simonida Rutar was seated next to Daniel Ritter, son of Emeritus Professor David M. Ritter, an inorganic chemist. Rutar is the recipient of an alumni book award. Ritter is a Seattle attorney practicing in the areas of business and banking law with the firm of Davis Wright Tremaine. The elder Ritter, who was unable to attend the dinner, had an endowed graduate student fellowship created in his honor three years ago by former students and his family. Ritter came to the UW in 1944 and retired nearly 40 years later.



Inorganic chemistry Professor James M. Mayer, who has been on the faculty since 1984, was flanked by Steven Alley and Connie Barthold, widow of the late chemistry alumnus Howard J. Ringold. In 1985, Mrs. Barthold established a graduate student fellowship in her husband's memory. Steve Alley is not only a past Ringold Fellow, but the recipient of several

other awards this year (see page 9). Ringold received his bachelor's degree in chemistry from the UW in 1946 and his doctoral supervisor a few years later was Hyp Dauben. Ringold died in 1984.



*(continued on page 19)*

## Faculty Update

### Wes Borden (organic)

Last fall Borden lectured at an international conference on Molecularly-Based Magnetic Materials in Tokyo, then took the bullet train to Kyoto, where he gave a talk at the institute headed by Professor Kenichi Fukui, the Japanese chemist who shared the 1981 Nobel Prize with Roald Hoffmann. This summer Borden will spend a week in Telluride, CO, participating in a conference on open-shell molecules with the provocative name "Radicals in the Rockies." He has been invited to England this December to lecture at a Faraday Society Meeting on Potential Surfaces for Organic Reactions. In addition to his usual professorial activities, Borden has donned a new hat, this one hard, as the chair of the department committee on the new addition to Bagley Hall. Attending weekly meetings on the progress of construction has caused Borden to realize that, compared to putting up a building for chemical research, running a research group is easy.

### Charlie Campbell (physical)

Campbell has recently been promoted to full professor. He has been teaching upper-level physical chemistry lately, and says he enjoys developing new approaches to that curriculum. Campbell remains very active in his research and thus, in graduate education, publishing thirteen refereed journal articles last year with his students. He also delivered two invited talks at Gordon Research Conferences about exciting new developments in his lab. He served this year on the editorial board of the *Journal of Catalysis*, and ran a symposium on Model Catalysts in May at the North American Meeting of the Catalysis Society. Campbell is also currently serving as the chairman of the ACS's Division of Colloid and Surface Chemistry, having served last year as chairman-elect.

### Robert Charlson (adjunct, Atmospheric Sciences)

Charlson has been awarded an honorary doctorate by Stockholm University and he travels to that country later this year to accept his degree at the Stockholm City Hall. He continues as a member of the editorial advisory boards for the *Journal of Aerosol Chemistry and Technology* and *Tellus B*, and he's a member of the NAS/NRC Committee on Atmospheric Chemistry. Charlson's work is supported by the NSF, NOAA, NASA, and the DOE.

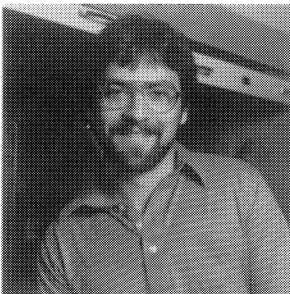
### Gary Christian (analytical)

Christian was selected as Associate Dean of the Natural Sciences for the College of Arts and Sciences last year. In addition, he was appointed to the advisory board of Wiley-Interscience Series in Laboratory Automation, to the editorial board of *Quimica Analitica*, and to the board of directors of the Society of Electroanalytical Chemistry for the next five years. Christian is a member of the scientific committee of the Fifth International Symposium on Drug Analysis, which will be held in Belgium in 1995. He is also a member of the scientific committee of Flow Analysis IV, to be held in Spain next year. Christian is the USA organizer for the symposium on Kinetic and Mechanistic Aspects of Analytical Chemistry, to be held at PACIFICHEM '95 in Honolulu. Christian has given invited talks in the past year at Michigan State University, Western Washington University, the University of Idaho, and at Université Libre de Bruxelles in Belgium.



### Richard Gammon (environmental)

Gammon, who is a joint professor of oceanography, was recently appointed an adjunct professor of environmental studies. He has funding from the NSF and NOAA to measure and interpret the oceanic distributions of chlorofluorocarbons as tracers of circulation and mixing.



### Mike Gelb (bioorganic)

During the past year, Gelb was awarded the Pfizer Award in Enzyme Chemistry, given nationally to a single recipient by the ACS's Division of Biological Chemistry. Gelb is also a Fellow of the Alfred P. Sloan Foundation and a National Institutes of Health Research Career Development Awardee. His work on protein prenylation, phospholipases, and enzyme inhibitors is being funded by three grants supported from NIH, one

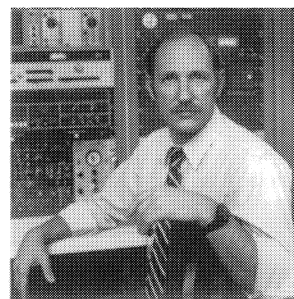
from Sterling-Winthrop Pharmaceuticals, one from Parke-Davis Pharmaceuticals, and one from the UW's Royalty Research Fund. Gelb gave invited lectures last year in Switzerland, Germany, and at a number of American universities.

### Paul Hopkins (bioorganic)

The binding of drugs, toxins, and toxicants to the genetic material continues to be of interest to the Hopkins group. During the past year, they have elucidated the complete covalent structures of lesions in DNA formed by the antitumor drug nitrogen mustard, the environmental pollutant formaldehyde, substances closely related to the plant toxins known as pyrrolizidine alkaloids, and the conjugate acid of the common food preservative sodium nitrite. In the past year, Hopkins initiated consulting relationships with Parke-Davis Pharmaceutical Research in Ann Arbor, MI and ISIS Pharmaceuticals in Carlsbad, CA. Hopkins is taking special delight in watching progress on the construction of the new chemistry building, which he helped to plan with his colleagues.

### Bruce Kowalski (analytical)

Last fall, Kowalski was named a co-recipient of the 1993 Torben Bergman medal by the Analytical Division of the Swedish



Chemical Society. The medal is awarded every three years on the occasion of the Division's conference *Analysdagarna*.

### Ken Krohn (adjunct, Radiological Sciences)

Krohn was recently elected a Fellow of the American Association for the Advancement of Science (AAAS). The award was "for research in nuclear chemistry and technology applied to plant and animal biology and to human medicine, and for developing the usefulness of metabolic imaging with positron emission tomography (PET) and NMR for selecting and evaluating medical therapy." It was presented at the annual AAAS meeting in Boston last February.

**Alvin Kwiram (physical)**

Kwiram was the 1992-93 chair of the AAAS Chemistry Section. He was responsible for the chemistry program at the Boston meeting which included symposia on Chemical Communications in the Plant and Animal Worlds, Nanoengineering, Fullerenes, K-16 Initiatives in Chemistry, and Handedness in the Scientific Domain. Kwiram is also a member of the Executive Committee of the ACS Division of Physical Chemistry and is vice-chair of the Committee on Science. Last year he organized a special 65th event in honor of Harden McConnell which led to a special issue of the *Journal of Physical Chemistry* (March 25, 1993). Recently, postdoctoral fellow Jurek Krzystek carried out the first successful field cycling experiment involving a paramagnetic species and used this approach to monitor the deuteron magnetic resonance in zero field by detecting the effect on the electron spin resonance at high field. This experiment, under development for the last two years, was carried out jointly with the Max Planck Institute in Stuttgart where a unique pulsed magnet is available.

**Marjorie Olmstead (adjunct, Physics)**

Olmstead came to the UW in January 1991 from the University of California, Berkeley, where she was on the faculty for four years. Her promotion to associate professor of physics, with tenure, was approved this past spring. Olmstead's research program spans the overlap between chemistry and physics: she investigates both the atomic scale interactions governing the formation of interfaces between

dissimilar crystals, as well as the physical properties of the resultant artificial structures. Her research program is now fully recovered from the northward move and in the past year her group has completed several papers and made presentations throughout the United States, plus at a meeting in Switzerland. Olmstead also participated in the National Academy of Sciences Frontiers of Science symposium.

**Yeshayu Pocker (organic and biophysical)**

Pocker continues to serve on the board of reviewing editors of *Science* and on the advisory board for Gonzaga University's Murdock Research Program. Last summer he presented two special lectures, entitled "The Catalytic Specificity of Liver Alcohol Dehydrogenase: Vitamin A Alcohol and Vitamin A Aldehyde Activities" and "Fluorescent Studies of Ternary Complexes of Liver Alcohol Dehydrogenase" at the 6th International Congress on Enzymology and Molecular Biology of Carbonyl Metabolism in Dublin. He gave invited talks at Trinity College of the University of Dublin and at the National University of Ireland. Pocker presented new findings at the Symposium on Neurobiology and Toxicology. During the past year, Pocker hosted two visiting scholars, Professors Clarita C. Bhat and John E. Meany. Members of his research group presented papers in biochemistry and physical organic chemistry at the ACS meeting in Laramie, WY. Pocker's students have been elucidating the chemical and physical properties of large carbon clusters. Their results were presented at the First International Colloquium on Science and Technology of Fullerenes in Santa Barbara.

**B. Seymour Rabinovitch (emeritus, physical)**

Rab continues his interest in silversmithing and the chemistry of antique silver. He has just developed a new method for gilding silver by use of organic gold sols. Rab chaired

the Pauling Medal symposium for Rudolph Marcus at Oregon State University, and in December, he was an invited guest at the Nobel Award ceremony in Stockholm.

**Bill Reinhardt (physical)**

Members of the Reinhardt group gave five talks at the March 1993 Seattle meeting of the American Physical Society, in areas ranging from "Chaos in the Spectrum of Helium," "The Structure of Water at Metallic Interfaces," and "Variational Bounds to Interfacial Free Energies," to "Lattice Models of the Folding of Membrane Proteins". Reinhardt has also given seminars this past year at Cornell University, the Joint Institute for Laboratory Astrophysics (University of Colorado), two talks at the University of Pennsylvania, at the University of Oregon's annual chemical physics retreat, and at UC Santa Cruz. Reinhardt co-organized (with Adjunct Faculty Member Thom Dunning of PNL, Hanford) a workshop on Massively Parallel Processing in computational chemistry. In addition, he participated, as a co-PI, in a week-long National Science Foundation-MacArthur Foundation workshop on high school science teaching, in Telluride CO.

**Eric Stuve (adjunct, Chemical Engineering)**

"Chemistry from molecules to barrels" is how Stuve describes his work, which combines research in electrochemical surface science with teaching of chemical engineering process design and thermodynamics. Stuve's research projects, funded by NSF, ONR, and PRF, deal with the surface chemistry of metal electrolyte interfaces and combined electrochemical and ultrahigh vacuum studies of fuel cell reactions. These projects provide insight into the surface phenomena of electrode/electrolyte interactions and scientific problems that hinder development of a direct methanol fuel cell. This year Stuve was elected as a Director of the American Vacuum Society and gave invited talks at national meetings of the AVS and the Electrochemical Society.

**Rob Synovec (analytical)**

Over the past year, Synovec and co-workers have participated in two Center for Process Analytical Chemistry (CPAC) meetings, presenting six posters and four student talks on work in process chromatography at each meeting. Three invited lectures were given at Exxon, Cargill, and Wright-Patterson AFB. Recently, Synovec was appointed as an Associate Editor for the international journal *TALANTA*. He was also invited to present a lecture on the "On-Line Analysis of Polymers" at the ACS 206th National Meeting in Chicago, in a joint session of the Analytical and Polymeric Materials divisions.

**Frank Turecek (analytical)**

Turecek presented an invited lecture at the New Horizons in Mass Spectrometry symposium at the 1993 Pittsburgh Conference and also has given lectures for the Societe de Spectrometrie de Masse in Metz, France, at the University of California in Riverside, and at the Hewlett-Packard Co. in Palo Alto, CA. He has finished the fourth edition of *Interpretation of Mass Spectra* (with Fred W. McLafferty), which appeared in May and sells for an incredibly low \$27. He has also co-edited a monograph on *Applications of Mass Spectrometry to Organic Stereochemistry* for VCH publishers which will appear toward the end of 1993. The Turecek group's research on charge transfer and hypervalent radicals has been supported by NSF and PRF, including a grant of supercomputer time at the NSF Cornell National supercomputer facility. Development of new instrumentation and analytical methods has been supported by CPAC and Hewlett-Packard Co.

**Bob Vandenberg (physical)**

Vandenberg spent a week in Japan this past February lecturing at a Winter School and he travelled last month to France to lecture about cluster impact fusion.

## In Passing

**T**he recent deaths of two emeritus faculty have saddened people around the world and have caused the department to reflect on the debt that is owed retired professors who helped shape the UW chemistry program in its earlier years.

Rex Robinson, who died at the age of 88 in October 1992, was an analytical chemist whose research in water chemistry made him an important contributor to the UW Department of Oceanography. George Cady, who died in March at 87, was an internationally-recognized expert in fluorine chemistry who also served as department chair for four years. Both were faculty committed to excellence in teaching and research and were highly revered by former students and colleagues.

Robinson was born and reared in Indiana and obtained his bachelor's degree from Depauw University in 1925. He started as an instructor at the UW shortly after receiving his 1929 Ph.D. from the University of Wisconsin. After spending his entire professional career of 42 years at the UW, Robinson became professor emeritus in 1971.



Rex Robinson

Prior to 1947, Robinson was a joint member of the Department of Chemistry and the Oceanographic Laboratories. Much of his oceanographic research was done in collaboration with Professor Tommy Thompson at Friday Harbor research facilities and aboard the research vessel "The Catalyst." After the Department of Oceanography was created, Robinson became a member solely of the chemistry department. Robinson's work dealt with both marine and fresh water and he was largely concerned with the colorimetric, spectrophotometric, polarographic, thermogravimetric, and microquantitative methods of analyzing water for various chemical constituents.

Robinson supervised many graduate students during his years at the UW and served on numerous committees for the university, college, department, and professional societies. In a letter written to then UW president Raymond Allen by a student in 1950, Robinson was characterized as a person the student was privileged to know. He felt Robinson was a teacher in the most professional sense of the word and that he keenly appreciated Robinson giving so freely of his time to all students, regardless of their standing in the class. Robinson was a "credit to (the) school."

He is survived by his wife of 60 years, Ruth, and three sons, Richard, Neal, and Clark, and their families. Contributions in memory of Robinson can be made to the Lloyd and Florence West Graduate Student Fellowship, established in honor of Rex Robinson.



George and Irene Cady

**G**eorge Cady lived just long enough to see the inaugural Cady Lecture, delivered three weeks before his death by his former student Jean'ne Shreeve, vice provost for research and professor of chemistry at the University of Idaho.

Cady was born in Kansas, the son of a former chair of the University of Kansas' Department of Chemistry. It was the elder Cady who discovered helium in natural gas.

Following undergraduate studies at the University of Kansas, Cady completed his doctoral dissertation in 1930 at the University of California, Berkeley, under the direction of Joel H. Hildebrand. Cady held positions at the University of South Dakota, MIT, U.S. Rubber Company, and Pittsburgh Plate Glass before coming to the UW in 1938 as an assistant professor. From 1942 to 1943, Cady worked on the Manhattan Project at Columbia University. He chaired the Department of Chemistry from 1961 to 1965 and became professor emeritus in 1972.

Cady was the recipient of many awards, including the 1962 Pauling Award, the 1966 ACS Award for Distinguished Service to Inorganic Chemistry, and the 1972 ACS Award for Creative Research in Fluorine Chemistry. In 1988, Cady shared the first Priz Moisson, a prestigious French prize named after the father of fluorine chemistry.

Remembrances to Professor Cady can be made to the Cady Lecture Fund, which was established by his many friends, colleagues, and family.

## Chairs' Secretary Retires After 30 Years

**W**hat goes around does not necessarily come around.

When Barbara Jaeger started part-time in the Department of Chemistry back in 1962, she remembers that the copiers "washed" the paper as it fed through the machine and then the secretaries had to hang the newly copied pages up to dry with little clothespins.

She remembers the days before computers. Even before electric typewriters. Secretaries had to manually place a special cap on the insides of typewriter keys in order to obtain Greek letters for equations.

She also remembers that the first time another secretary wanted to wear jeans to work the question had to first be put to a faculty vote. The group approved the woman's request, as long as she continued to occasionally wear skirts and dresses.

After advancing through the clerical ranks, Jaeger became the permanent secretary to the chairman in about 1977 and recalls that she trained a total of three former chairs and five acting chairs during her time. At last January's dinner to honor her service to the department, six of them gathered to help usher her into retirement.

Jaeger doesn't worry about filling her days now that she's entered a new phase in her life. She has signed up to take several water color and sketching courses through a senior citizen center. Eventually, she'd like to take art courses at the UW through its Senior Access Program.

Jaeger's interest in art is of longstanding. She took many high school courses in the subject but was never encouraged to follow through with her skill after her 1945 graduation. Instead, she worked as a secretary and practiced her rollerskating. Jaeger admits she was a big flirt and liked to meet sailors at the rink. Her favorite part was watching when the boys would twirl the girls around in the center of the



rink while the girls had their legs entwined around the boys' necks. Despite often going to rollerskate three times a week, she ended up marrying a man who worked as a civilian at Todd Shipyards. Coincidentally, he was her stepfather's supervisor at the time.

Her husband went on to become a Metro bus driver and together they raised two children. He died in 1989, after 43 years of marriage.

Jaeger eventually became office manager and supervised all of the department's secretarial staff. What she remembers more proudly, however, is the work she did in assembling and editing the ACS Division of Physical Chemistry's newsletter when Alvin Kwiram was chair of the department and the division. One of the largest projects she coordinated was the annual salary survey, in which she contacted over 50 universities nationwide.

The people she worked with is the aspect of Bagley she'll miss the most. What she won't miss are some of the more disconcerting events to which a university campus is often witness. Such as that time in the 1960s when campus radicals were threatening to storm Bagley Hall. The campus had already been the scene of a previous bombing and things were extremely tense inside the building. Jaeger doesn't hunger for the high drama of those days and is content now to read, paint, do cross stitching, make ceramics, and be with her family and friends.

## Outstanding Staff Prize To Office Manager



**T**he staff luncheon at Ivar's Salmon House was the setting for the naming of the third annual Outstanding Staff Prize winner. Linda Leadley, a departmental employee since 1977, was awarded with a gift certificate to the University Book Store and her name will be engraved on a plaque which hangs in the main office entry.

While Leadley modestly attributes longevity to her selection, she was nominated by another staff member who feels she has always demonstrated professionalism, resourcefulness, efficiency, personal integrity, and dedication.

Leadley is the main office's support supervisor. She is not only the chairman's secretary, but she is also responsible for certain aspects of the department's operation (department telephone network, proposal/grant records, annual fire permits, etc.) and she supervises the front office's secretaries and receptionist.

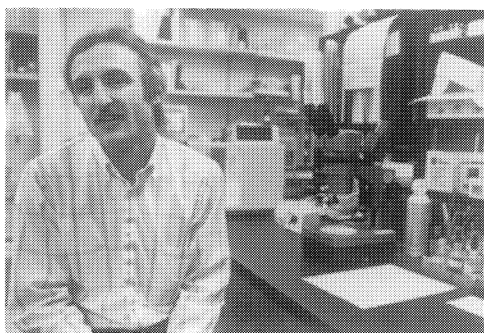
Leadley felt it was important to give secretaries areas of responsibility which they could call their own. In this way, individuals could have a departmental identity of their own, in addition to their normal secretarial responsibilities. She was treated in a similar manner when she was promoted from a departmental secretary to a program assistant about five years ago and she appreciated the sense of accomplishment that went with her own projects. That particular promotion also coincided with the time that her children were becoming independent and she was able to parlay what had formerly been a nine-month position into this new, full-time job. Leadley also returned to school, taking classes at night at local community colleges.

Shortly after relocating here in 1962 and finding employment as a secretary at Boeing, Leadley met her husband, who has been a Boeing employee for more than 30 years. They have two daughters, one a senior at Washington State University and the other a junior at the UW.

Walking is one of Leadley's favorite past-times. She is involved with the Volkssport group and helps lead a UW contingent of regular noontime walkers around upper campus three times a week. Averaging under 20 minutes per mile, Leadley finished a walking marathon a few years ago. To practice for the 26 mile course, she and a friend would walk around Green Lake at night until they got dizzy.

Leadley also enjoys reading novels by Rosamunde Pilcher and Anne Tyler, as well as playing bridge and attending performances at the Seattle Repertory Theater. The fact that she intends to remain in Bagley Hall until her retirement is, in part, a tribute to the people that Leadley works with. Some of her closest friends are other members of the staff and she regularly gets together with them to scour arts and crafts shows. One of the nicest things she likes about her latest job promotion is the window that came with it, although she also appreciates the diversified nature of the work that comes with assisting the chairman.





Steve Banerian

## Crime Pays For These Chemistry Alums

**S**ome things to remember before becoming a forensic scientist: You must learn to tolerate the fact that attorneys are not inherently interested in the truth. As a forensic scientist, it is not your job to determine the guilt or

innocence of a person on trial. Like actor Michael J. Fox in "Back to the Future," a successful criminalist has to have the ability to reconstruct the past. And, the field is equally rewarding to scientific dilettantes as it is to specialists.

Six former chemistry students spoke recently about their jobs as criminalists at the Washington State Patrol's crime laboratory in downtown Seattle. The state has three main labs, the other two being in Tacoma and Spokane, and three satellite labs in Kelso, Everett, and Kennewick. The Seattle lab is divided into six sections: firearms and tool marks, chemical analysis, microanalysis, biochemical analysis, DNA, and forensic document examination (to authenticate handwriting and documents such as birth certificates, etc.). UW chemistry alumni currently work in four of these areas, although there is a lot of cross-training and technical support among people in the different groupings.

While TV's "Quincy" made the job done by forensic scientists seem glamorous, in truth, criminalists have to deal with a variety of unknowns which can make the job extremely frustrating. Steve Banerian, who received his chemistry master's degree in 1983, says that sometimes drug cases are dismissed because there isn't enough material to identify, even though sophisticated testing procedures such as FTIR, mass spectrometry, and chromatography (both gas and thin layer) are employed. Banerian has been working in the chemical analysis section since 1990 and says that the routine testing of drugs can become tedious and testifying in court on behalf of the prosecution every week eventually takes its toll. What makes his work more interesting are the occasional cases involving clandestine drug laboratories, testing for explosives residues in explosion debris, and other non-routine cases.

Banerian pointed out that the chemist's definition of a particular drug may differ from how the law defines that same controlled substance. The legal definition is generally more inclusive and as a result, Banerian makes every effort to conduct more analysis on evidence than would normally be thought necessary so that he can eliminate any possible doubt over the substance's identity.

Criminalists in the chemical analysis section have to be intimately involved with the various tests they conduct, and the tests' limitations, in order to be able to explain to a jury of nonscientists in easily understood language why, for example, mass spectrometry cannot distinguish certain optical isomers of cocaine.

One of the changes in the profession that Banerian has seen in just three short years has to do with the disposition of syringes which may contain evidence requiring chemical analysis. Before, criminalists used to cut off the needles in order to obtain the material and would discard the needles in the trash. The Washington Administrative Code no longer allows syringes to be tested. Now, police officers empty the contents of a syringe into a vial and this is submitted to the crime lab for testing.

Banerian also does not analyze residue on razor blades, his bigger fear being hepatitis and not AIDS. The hepatitis virus can live much longer than HIV, which is actually quite fragile. Similarly, he dislikes working with things which have decomposed. Before coming to the crime lab, Banerian worked in an environmental chemistry laboratory and in the intelligence community and translated Turkish, Farsi, Hebrew, French, and Arabic.

Also in the chemical analysis section is Ed Suzuki, who received his 1969 bachelor's degree in chemistry from the UW and his 1975 Ph.D. from Oregon State University. He made the decision not to seek a professorial job and after a few years working for the National Marine Fisheries Service, he joined the crime lab in 1979.

Suzuki's area of expertise is in spectroscopy and he frequently examines evidence using FTIR or an x-ray fluorescence spectrometer. In addition to working on more routine drug analyses, Suzuki has adapted methods of analysis for cases involving metals, pipe bombs, illegal fireworks, and residues from other explosives and incendiary devices.

He recalls a few crimes in particular where spectroscopic analysis allowed him to reconstruct the event in a manner that was consistent with the physical evidence. In a case where a suspect in a criminal investigation was found dead in his car of a bullet wound to the head following a car chase with police officers, Suzuki's analysis corroborated the hypothesis that the wound was self-inflicted, disproving arguments made by the suspect's family that the police had killed this person. The suspect had been using a pistol with black powder propellant in the cartridges. All modern cartridges use smokeless powder made primarily from nitrocellulose, the residue from which is very different from black powder, which is comprised of potassium nitrate, charcoal, and

sulfur. Suzuki's examination of the inside of the man's skull adjacent the point where the bullet entered showed elevated levels of potassium and sulfur compared with other parts of his skull. The pattern and type of residue was consistent with the premise that the suspect had held the gun against his head when he fired. The police were not responsible for his death.

Often, however, piecing together the events of a crime, or suspected crime, involves serendipity. An inmate at a Washington penal institution was found by prison guards to have a wad of unidentified material in his possession. Fearing that it was some kind of plastic explosive, the evidence was sent to the crime lab for analysis. Suzuki's tests showed that it was primarily calcium carbonate and polyisobutylene and was quite pliable. Suzuki says in this job you have to call on everything you ever learned in school and then some, since anything can end up as evidence. Just by chance, he mentioned to the forensic scientist next to him that this particular substance was neither an explosive nor a common rubber product and the person, pulling out a similar wad from his own pocket, suggested that it might be an artist's eraser. Indeed, it was.

One of the challenges to this job that Suzuki enjoys most is that there is often no prior protocol in the analysis of an unknown object which is turned over to him for testing. He also appreciates working on special projects that allow him to use forensic applications of spectroscopy. Suzuki is currently establishing a data base of more than 3000 paint samples from American-manufactured cars made between 1974 and 1989. Paint chips are frequently left behind at the scene of hit-and-run accidents. Microscopy and spectroscopy are routinely used for their analysis. In some cases, these techniques can serve to pinpoint a paint chip's origin to a specific make, model, and year.

**Don MacLaren**, a bachelor's degree graduate from 1970, has worked in several of the divisions in the crime lab and is currently the supervisor in the DNA section, which he helped to establish.

When MacLaren first got into forensic science, he worked for the Seattle Police Department's crime lab and then the state lab doing drug testing. He eventually moved to blood typing and other body fluids. Since the earlier days of this kind of work, tests have become much more sophisticated, reliable, and expensive, with criminalists now using electrophoresis to type enzyme and serum proteins.



Ed Suzuki

In the mid 1970s, MacLaren worked on the analysis of glass, paint, and fiber samples and did footwear and shoe print comparisons. However, he's always had a preference for the biological side of physical evidence examination and made a point of staying away from microscopic identification, such as in hair analysis, because he didn't feel he had the particular talent it took to do this kind of work. In 1977 he became the supervisor in the biochemical analysis section.

In the area he has overseen since 1989, there are two separate DNA programs: one involving on-going criminal casework and the other a computerized data base of nearly

7000 blood samples taken from people convicted after July 1990 of sex offenses and violent crimes. MacLaren says Washington was one of the first states to legislatively mandate such a program and now about 20 states across the country have similar projects. The FBI is establishing a national data base of this information and hopes to have it operational by the beginning of 1994.

With DNA typing, the results can take as long as six weeks for films to develop and new methods are being explored to cut down on the time it takes to obtain answers. MacLaren says the controversial aspects of DNA testing center over the interpretation of the results and not the methodology. He pointed out that criminalists in his area don't ever claim that a particular person committed a particular crime to the exclusion of all other people. Rather, forensic scientists evaluate the frequency of a person's DNA profile in the general population and then testify on the basis of the suspect's random match with this profile.

Another alumnus who has joined the supervisory ranks at the crime lab is **Bill Gresham**. After receiving his bachelor's degree from Harvard, Gresham came to the UW for his doctorate, graduating in 1971 under Hyp Dauben's direction. He joined the lab in 1972 and is currently a first-line supervisor in the chemical analysis section.

When first hired, he, too, worked mainly on drug cases. Eventually, Gresham moved into arson investigations and later trained others in this area. When the State Patrol decided to update the methodology testing of breath-alcohol analysis, Gresham served as a consultant in writing specifications for the new equipment which involved computer communications with over 100 instruments all over the state.

Insight into how an applicant for a position at the crime lab might think often comes during the oral interview, for which Gresham has written questions over the years.



Bill Gresham

"Why is the sky blue" is a good question in order to assess how strong the person's deductive reasoning ability is, how broad their general science background is, and also gives the interviewer a sense of how articulate the person would be in court answering equally unexpected questions.

One difference between a research career and what Gresham has chosen to do lies in the fact that each case has a beginning, middle, and end and Gresham is able to bring closure to projects. He also feels he can make a bigger difference within the smaller confines of this lab rather than at a giant chemical company such as Union Carbide, where he worked for a while during his graduate years.

Gresham expects that people who are employed in the chemical analysis unit completely understand the instruments they operate and tests they conduct. These people need to be able to explain in clear terms - both orally and in writing - why certain tests yield better results than others on a particular piece of evidence. Because every test has limitations, criminalists are often unable to say categorically whether something is true or not. But, Gresham points out that ascertaining guilt or innocence is not their job. Their function, rather, is to provide accurate information and then the jury, under the adversarial system, decides a person's fate.

Criminalists in the tool marks and firearms division work very closely with police officers and prosecutors

and frequently offer lengthy testimony in court. Those are some of the draws of the job for **Ray Kusumi**, a 1981 bachelor's degree graduate from the UW.

In general, Kusumi finds his work fascinating. He appreciates the extra training he's been able to receive in order to become a crimescene reconstruction specialist and

blood splattering interpretation specialist. He's also been trained to evaluate a crime scene, such as a clandestine drug laboratory, to determine if bombs, booby traps, or chemical hazards are still present before officers are sent in to collect evidence.

Along with Gresham and Banerian, Kusumi will receive three college credits for taking an electronics course, offered only to criminalists, by Eastern Washington University Chemistry Professor Will Pettit, who is on sabbatical this year in the Seattle area. The state is not able to purchase service contacts on all of its instruments and employees are often called upon to repair damaged analytical equipment.

There is a larger forensic realm in the tool marks and firearms section, Kusumi feels. He deals not only with the chemical analysis of items such as clothing to determine the presence of gunshot residue (lead and nitrates), but the mechanical testing of weapons or objects to obtain identifying marks such as striations which might connect them to the crime scene, cartridge comparisons to see if the casings recovered at a scene came from the gun confiscated with the suspect, polishing and corrosion tests to raise the serial numbers on firearms which have been obliterated, trap tests in large tanks of water to recover test bullets in order to do comparisons between these bullets and those recovered in the victim or at the crime scene, trajectory reconstruction of bullets, etc.

Kusumi has been involved with poison cases, as well. He recalls the time when a vengeful tenant, recently evicted by his landlord, adulterated her diet Slim Fast. Fortunately, the woman noticed the drink was giving off a strange odor and alerted police before she consumed any of the poisoned liquid.

In another case, Kusumi was involved with the examination of evidence from a four acre crime scene, huge by any standards. Last winter, a melée broke out in downtown Seattle after a rap concert. Shots between the suspects and the police were exchanged, with the suspects claiming self-defense. Kusumi was able to determine, from studying the angle of the bullets as they entered the suspects' car, that the police fired only after being fired upon.

Sometimes a jury finds itself in a quandry when opposing expert witnesses offer conflicting testimony. In one case, Kusumi showed that a woman could not have shot herself, based on the gunshot residue pattern on her clothing. Her ex-boyfriend, who was charged with murdering her, had originally claimed the wound was self-inflicted, but after hearing Kusumi's testimony, changed his story to say the gun went off during a struggle which ensued over control of the gun. Even though Kusumi scientifically refuted that second claim, the jury chose to believe the suspect's expert and they found the man guilty of a lesser charge.

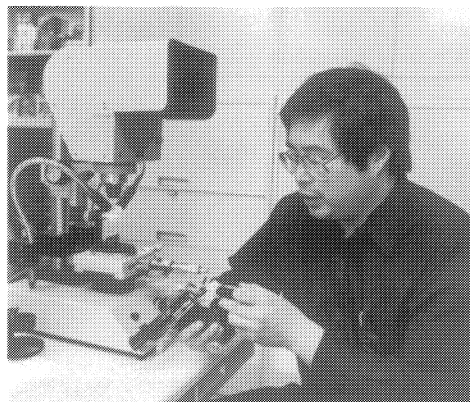
Kusumi has been at the crime lab since 1984. He originally joined the chemical analysis division and moved to tool marks and firearms in 1992. He worked previously for Olympic Stain as a coatings chemist, a job from which the knowledge has held him in good stead at his present position.

In the microanalysis section where Kerstin Gleim works, the job is often more subjective than in the other units and steady hands and a keen eye are necessary tools of the trade. Nowhere is this more true than in the analysis of hair samples, an area in which Gleim's apprenticeship will last several years.

Some of the traits that criminalists examine under a very high-powered microscope include pigment distribution, size, color, background color, and twist. A single hair may change characteristics over its length and forensic scientists look to see if the hair falls within a certain range of traits identifiable to a particular person. Most hair analysis cases involve sexual assaults against women. Gleim says that the general public would be shocked if they knew the extent to which crimes are committed against women and how many cases never proceed very far either because the police have so little evidence to work with or

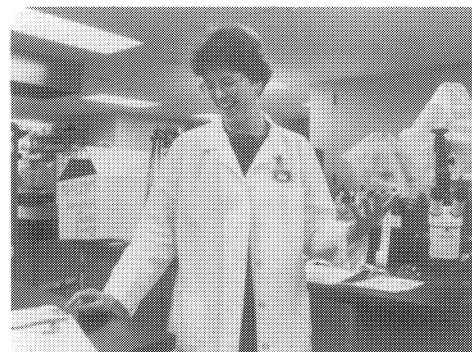
there aren't enough people available to analyze the evidence for cases which aren't going to trial.

Gleim has examined everything from doors, walls, bicycles, damaged clothing, car parts, shoe prints, paint chips, glass fragments, to very small particles such as fibers under her microscope. She finds her work esthetically pleasing and says that a good optics background is a plus in a job such as hers.



Ray Kusumi

When Gleim earned her first bachelor's degree in 1970 in geography, she got her first exposure to microscopy. Eight years later, Gleim picked up additional degrees in chemistry and biology. She believes that her chemistry study prepared her well for her current work in that it taught her to tolerate and work with ambiguous results, something with which she is familiar at the crime lab. Before starting there in 1981, she worked for



Kerstin Gleim

a short time at the National Marine Fisheries Service. There, she originally met Ed Suzuki, who eventually recruited her for the crime lab job.

What Gleim keeps coming back to is how much she enjoys the problem solving aspect of her work. Putting all parts of the story together, using her sound judgement to reach conclusions, interpreting for the court what narrow area of the truth her evidence points to - these are among the most rewarding aspects of forensic science. The job stretches her mind and exhausts her and she loves it. Gleim has done some public speaking at local schools and recently gave a talk to middle school girls about career opportunities in science through the "Expanding Your Horizons" program sponsored by the American Association of University Women.



### More Donor Dinner Guests



Vaughn L. Blumenthal, who received his B.S. degree in 1939, chatted with Theodore R. (Ted) Beck, a 1949 B.S. and 1952 Ph.D. graduate in chemical engineering. In 1953, a separate Department of Chemical Engineering was established within the College of Engineering. Blumenthal spent over 40 years at the Boeing Company, working both in the commercial aircraft and defense fields. Beck also worked at the Boeing Company, but left in 1972 to pursue other interests. In 1975, he formed his own company, Electrochemical Technology Corporation.

### Construction Crew Relaxes



From left are former Chemistry Chair and current Vice Provost for Research Alvin Kwiram, Professor Paul Hopkins, Chair Bob Watts, Professor Mickey Schurr, former Chair Tom Engel, Chemistry Administrator Gary Pedersen, Professor Mike Gelb, Director of Undergraduate Services Ruth Levy, and Professor Jim Mayer.

(continued from page 7)

### **Volcano Conference Held**

Biological chemistry was once again the major theme for the third annual Volcano Conference held at the base of Mount Rainier in Pack Forest, a UW-owned parcel of land used as a training forest.

Conceived and organized by Professor Michael H. Gelb and University of British Columbia's Steve Withers, this year's meeting was underwritten by Merck Frosst Canada, Inc.

The weekend drew undergraduates, graduate students, faculty, and postdoctoral fellows together from the universities of Washington,

Alberta, British Columbia, and Oregon, as well as from Washington State, Oregon State, and Simon Fraser universities. Scientific talks were interspersed with outdoor recreation and, in Gelb's opinion, the scientific interactions served as a morale booster for attendees.

### **Division of Chemical Education**

In only its second year of operation, the Division of Chemical Education doubled the scope of its seminar program and brought a dozen nationally-recognized chemical education experts to the UW as speakers.

Two of the division's members, Deborah Wiegand and Frazier Nyasulu, had their Department of

Energy funding renewed and will once again be holding their summer program designed to introduce high school students to college science by enrolling them in the quantitative analysis course. The division's coordinator, Sara Selfe, is involved in curriculum review and outreach programs. Their work has gained national prominence and the faculty have been frequently asked to give talks at scientific meetings this past year.

### **Résumé Books For Grads and Undergrads**

The success of earlier résumé books for graduate students has prompted the department to recently extend this service to its undergraduates

and publish the first résumé book for its bachelor's degree students. More than 500 companies nationwide are included on the mailing list for the graduate students' book but the distribution of the undergraduates' book is more modest and includes only Puget Sound and greater Pacific Northwest employers of chemists. Companies who had not originally intended to recruit at the UW scheduled interview trips to the department after receiving the book and several students have been contacted independently as a result of the publication. Students are given classes in résumé writing, cover letters, and interviewing techniques by departmental advisers.



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