Chem Letter

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Dear Alumnus or Friend,

It is a pleasure to provide this issue of the *Chem Letter*. I hope you enjoy these updates on our programs, the heart of which are our students, faculty and staff.

I've said it before. I'll say it again. The big news continues to be the popularity of our undergraduate program, especially our Bachelor of Science in Biochemistry degree program. We awarded some 150 bachelor degrees in chemistry and biochemistry during the past year, making us about third largest in the nation by this measure. Enrollment in other sciences requiring a firm foundation in chemistry also continues to rise, filling to capacity our freshman and sophomore courses. The result has been that during a time of fiscal restraint in higher education, when the faculty sizes of two-thirds of the departments in the College of Arts and Sciences have declined or just held even, our faculty size has slightly increased. We have seized this opportunity to explore new research and teaching initiatives. Two of our newest faculty are highlighted in this issue.

I hope you will also take a few minutes to read about our revitalized honors program. About one quarter of the faculty has been involved in updating our lectures and laboratory courses for the most able undergraduate students. These students are encouraged to participate in summer research, enjoying the benefit of a scholarship provided by private gifts to the program. The pay is comparable to flipping burgers, but we think more intellectually stimulating, and better preparation for the future.

The list of donors to the department (see pages 14-16) is overwhelming in size! We know that this is one way our alumni tell us that they valued the education they received at UW. It is a pleasure and frankly something of a surprise to see so many names of the faculty and staff among those listed, because UW faculty and staff salaries presently lag national averages, and are no match for the cost of living (especially housing) in the Seattle area. These donations to the department have become absolutely critical to us in maintaining and improving our excellence. Recruiting outstanding teaching assistants to our classrooms has long relied upon donated funds. We appear to be headed for a future in which a portion of faculty salaries will come from this source, as well.

Let me close by mentioning several recent and unusually generous gifts to the department. Professor Larry Dalton and his spouse Nicole Boand have recently provided a major gift to establish an endowment to help with the recruitment and retention of the faculty. Doctoral alumnus Lloyd West (UW Ph.D. 1939 with Rex Robinson) called during winter quarter and brightened an otherwise overcast day, announcing that he and his spouse Florence would make the largest single gift in the department's history. The West Endowed fund is particularly valuable, because its proceeds can be used at the discretion of the chair. Even in my brief four years as chair, I have seen that the department's needs are a moving target, and that the availability of funds which can be used flexibly is critical. Finally, in late-breaking news, Emeritus Professor B. Seymour Rabinovitch has made an extremely generous gift that will endow a graduate fellowship. Rab had some 40 graduate students of his own, and well understands the importance of providing adequate financial support to allow our students to focus on their studies. There will be more information on this gift in the next issue of the *Chem Letter*.

If your internet stocks have soared to heights unimaginable, and you want to be rid of them, do give me a call at 206-543-1613. We put every gift to good use.

Enjoy this issue, and please support education at all levels.

Sincerely,

Paul

Paul B. Hopkins
Professor and Chair

New faculty
ADD TO EXISTING STRENGTH

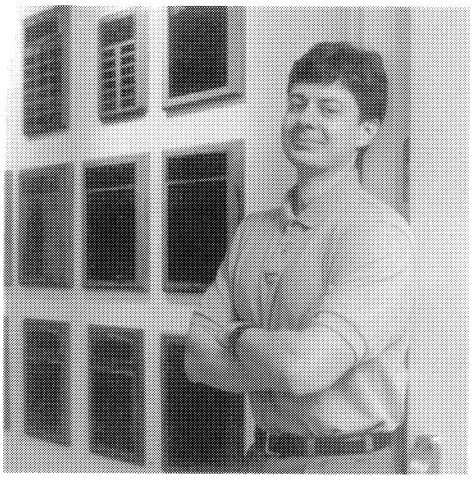
For new assistant professor **OLEG PREZHDO**, one of the major differences he has found between assistant professors here and in his native Ukraine is that in the United States, assistant professors delegate much of their science to their students and then function like managers of their research operation. In the countries which comprise the former Soviet Union (FSU), graduate students are not as heavily relied upon and so the assistant professor does more of his or her own work.

Another variance between the two scientific styles is that in the FSU, professors do not change research fields nearly as often as they do here. By that, Prezdho means faculty tend to stay with a particular area for a long period of time, with the goal of developing a very deep understanding of the processes. In the USA, Prezdho finds that professors move much more quickly to other projects but he believes that is, in part, due to the much broader range of scientific endeavors available to researchers here.

Other than these obvious differences, Prezhdo has acclimated to scientific life in this country. He received his Ph.D. from the University of Texas in Austin with Peter Rossky and then did postdoctoral work at Yale University with John Tully. Prezhdo's work involves the condensed phase photochemistry, electron transfer, surface science, and other non-adiabatic chemical processes.

Prezhdo comes from an academic family. His father is a professor of physical chemistry in Poland and his mother, who has a doctorate in mathematics, is currently the head administrator for a small, new university in the Ukraine. Despite their experience, there was precious little information about how to apply to graduate schools in the United States when the time came. After Prezhdo and a friend sent in a "practice" application to one American school which had sent material randomly to one of his professors, they were accepted. Since they now had the hang of it, they began a much more systematic application process and that's how Prezhdo found Texas.

This fall begins Prezhdo's second year at the UW. He gave his first invited paper this summer in Boulder at the American Conference in Theoretical Chemistry. Later in the summer, he is giving a talk and chairing a session at a Gordon Conference on optical control.



It was during a canoe trip for students at Kharkov State University, Prezhdo's undergraduate alma mater, that he met his wife, who later became a chemistry high school teacher. While Prezhdo might deny the claim that their eight-year old daughter is a child prodigy in the chess world, she ***did*** place second in her very first national competition this past year. She has been playing chess for a year-and-a-half but had never played in tournaments until this year. While his daughter has learned the rules of the game, Prezhdo says that the main goal for kids at this age is to learn to pay attention and recognize undefended pieces.

Prezhdo cross-country skis, plays tennis, and windsurfs. In his younger days, he recalls being a summer camp lifeguard on the Black Sea near where the top Communist officials had their dachas. One time, he and a friend tried to swim past one of the mansions, but the KGB made them turn back.

One hobby which Prezhdo enjoys because of its challenge is keeping discuses, which are freshwater (river) fish belonging to the cichlid family. He is attracted to their exotic colorings and diverse shapes. All discuses require a fairly complicated aquatic system and Prezhdo says that the chemistry involved in keeping his fish alive interests him. One of his fish is from the Amazon River and some of the varieties he currently has include Snake Skin, Blue Diamond, and Blue Royal. Prezhdo is partial to fish as pets because, as he says, the worst they can do is die. No accidents to clean up, no barking to contend with, and no hair to brush off his clothes.

Sitting high atop a corn-picker under an unforgiving sun in southeast Ohio, **LARRY DALTON** knew from a young age that he was never going to be a real farmer. Let his brothers and sisters inherit the family business, if they liked. Things were hard enough, this wasn't going to be the life for him.

The first stop on the road out of Belpre, a small town with then less than 4,000 people which is now known as the "Baby Doll Capitol of the World," was at Michigan State University. Dalton graduated from their Honors College in 1965 and then received his master's degree the following year. Harvard was next. His doctoral work there on magnetic resonance and relaxation was supervised by Alvin Kwiram, who later became a UW chemistry professor and chair of the department. Kwiram is currently senior vice-provost for research at the UW.

Dalton made his way quickly from assistant and associate professor at Vanderbilt University, to full professor at the State University of New York at Stony Brook, to the Moulton Distinguished Professorship at the University of Southern California. At USC he was also named co-director of the Loker Hydrocarbon Research Institute. All along, however, he continued to acquire professional and personal ties to the University of Washington.

Not only was Alvin Kwiram now at the University of Washington, former graduate student and postdoctoral associate, Bruce Robinson, had joined the UW faculty. Dalton was friendly with other members of the physical chemistry faculty and looked upon the department as one with outstanding scientists and much potential. He believed the UW was poised to make the same impact in the Pacific Northwest that Berkeley had done many years ago in California as a major research institution.

Dalton's work has frequently been recognized by others in the scientific community. He is the recipient of, to name but a few, a Dreyfus Teacher-Scholar Award, a Sloan Fellowship, two NIH Career Development Awards, an ACS local section prize for creativity and scholarship, and the 1996 Tolman Medal in recognition of outstanding contributions to chemistry. He is widely consulted by industry and is frequently asked to sit on federal panels and review groups too numerous to name.

At USC, Dalton's work focused on electroactive materials and the development of new forms of non-linear optical spectroscopy. This work remains a focus now that he is at the UW, but he is branching out into the area of nanochemistry, as well. He has grant funding in excess of $2 million dollars a year.

Dalton played a major role in defining critical supramolecular interactions involving red blood cell proteins including Band-3, hemoglobin, glyceraldehyde-3-phosphate dehydrogenase, and aldolase. His work on sickle cell hemoglobin aggregation resulted in his being selected as a participant in the NIH Think Tank on Sickle Cell Anemia and as a member of the parent committee for review of Comprehensive Sickle Cell Centers (NIH/PHS). This affiliation hits close to home for Dalton. As an African-American, he has family members who suffer from the incurable disease so he is eager to contribute in any way that he can. Dalton is also a member of the Shawnee Nation.

The riots which erupted in Los Angeles after the Rodney King beating were visible from Dalton's office window. He watched the city burn. He also feared for his students' safety around campus, recalling that he visited several of them in the hospital over the years after muggings. Without significant urban renewal, he feared that USC would fall victim to decay, so leaving an inner-city school appealed to Dalton and his wife, an equestrian and former chiropractor. They now have the room to board their horse on property which is on a nearby island in Puget Sound, and Dalton is only a beautiful ferry ride away from work.

doing the HONORS

special funding for research opportunities and new approaches to old courses revive chemistry honors program

All involved agree that Paul Hopkins is the person to credit for revitalizing the department's honors program. When he became chair four years ago, one of his goals was to generate an atmosphere in which the best students could learn from the best teaching faculty in small-group settings. He wanted to promote seminar-like discussions which were logistically impossible in larger classes.

He envisioned an environment where the faculty could be more responsive to students' questions and where the faculty would be challenged to go beyond the prepared lecture in response to students' interests. Hopkins also knew that these students should be introduced to research as soon as possible but there was no mechanism for ensuring the brightest students were made aware of the opportunities.

Considerable university and departmental resources were already being focused on less-prepared students. Courses which emphasized quantitative skills as a prerequisite to science majors' general chemistry were already part of the UW's program. The new Chemistry Study Center, which was built to accommodate all 100-level students, is staffed throughout the day with graduate students and hourly assistants to meet the high demand for its services. The room is often filled to capacity, as nearly 100 students seek academic support at any one time.

At the other end of the academic spectrum, students with SAT scores often in excess of 1500 and with high school gpas which reflect a steady diet of "A"s, chose to come to the UW, despite being accepted at the most prestigious universities in the country. Couldn't the University of Washington educate them in a way which not only matched their potential, but stretched it?

Prior to Hopkins' efforts, the honors program had become a shell of its former self. The department didn't offer three quarters of honors freshman chemistry. Honors organic chemistry in the second year had become a course where 50 percent of the students were clearly in over their heads. Honors physical chemistry was no longer being taught.

Undaunted, the sheer force of Hopkins' personality provided the first spark to rejuvenating the honors program. He excited just the right faculty with his ideas and they, in turn, agreed to shore up the curriculum.

Hopkins' ideas also resonated with a major departmental donor, who provided seed money for an honors research program. Hopkins garnered additional support from industry, private foundations, and the university, until he had enough resources to provide summer stipends for honors students who worked full-time in laboratories. He's hoping additional donations will allow him to eventually establish an endowment.

Honors General Chemistry

There was already one faculty member who was genuinely disturbed about the state of the honors curriculum when Hopkins took over as chair.

Professor Jim Callis says he made the mistake one day of picking up a general chemistry textbook. What he read appalled him and he began to rethink how freshman chemistry should be taught.

He saw that texts were still published as if chemistry was mainly a descriptive science. The idea that chemistry had a rigorous quantitative basis just wasn't emphasized enough. Titration curves, for example, were described using several different approximations and the students weren't introduced to the simple, yet powerful, idea that one equation could be used to explain all of the different phenomena in the curve. The old equations were obscure and defied cognition. The new pedagogy could be reached in minutes using a computer.

With the advent of truly powerful and affordable PCs, Callis knew it was possible to introduce a new paradigm into the teaching of freshman chemistry. But, he hesitated to try his ideas in large classes and felt that honors students would be able to handle an experimental curriculum better. He also needed to submit a grant proposal to the College of Arts and Sciences to buy computers.

Thus began a process five years ago where the major chemical concepts were studied in two week cycles. In the first week, the students learned the theory in lecture. By using computers in a simulation lab in the second week, they could firm up their understanding of the theory by graphically simulating it and hypothesizing the outcome of an experiment. In the latter part of the second week, they tested the strength of their predictions with a laboratory experiment.

Callis was committed to making this approach quantitative and settled on Excel as the best mathematical environment. He also selected Oxtoby and Nachtrieb's text, which is the most rigorous book available.

At first, his changes met with substantial resistance. The students weren't used to thinking of chemistry quantitatively as high schools still taught chemistry more as an art than a science. But in five years' time, a change in attitude has evolved and Callis finds his students much more receptive to this approach.

Next, Professor Mike Heinekey, associate chair for undergraduate studies, assumed responsibility for the third quarter of honors freshman chemistry. When Professor Norm Rose entered upper administration several years ago, his CHEM 164, which was usually taken by honors students in the third quarter, was orphaned. Now, a new course, CHEM 165, became a rigorous examination of selected topics in a manner befitting very bright students.

New laboratory experiments were designed for this course and the students work in teams to carry out a research project and write a term paper. Heinekey also has introduced his honors students to electronic database searching.

Recently, an entrance examination was incorporated into the first quarter of honors freshman chemistry, which makes the course more homogeneous. Not only are the weaker students no longer frustrated being in a class they aren't prepared for, faculty teaching the sequence now have the ability to fly higher with the better prepared students. The test yields a win-win situation for all involved.

Honors Organic Chemistry

Changes in the organic sequence reflected less wholesale revision but accomplished many of the same objectives as in freshman chemistry.

The faculty selected a new book for the sequence, *Organic Chemistry* by Jones. According to one of the primary lecturers for this sequence and the undergraduate honors program director, Professor Bart Kahr, the course now has a more sophisticated approach which allows faculty to emphasize molecular electronic structure.

Admission into the honors organic sequence, now by application only, is the biggest change which was instituted. Prior to the test, students self-selected to take these courses, often with disasterous results. With the class size now limited, professors can operate in a more interactive manner, not unlike the format used in British universities.

Graduate students Steve Moskowitz (left, standing) and **Bill Stier** (right) work in the new Chemistry Study Center as part of their teaching assistant responsibilities.

It is not necessarily the students with the highest grade point averages who are allowed into the course. Kahr says he reviews the applicants' transcripts and the written answers to questions, including a statement of their academic goals, and bases his admissions decisions on a number of factors, not all of which are quantitative.

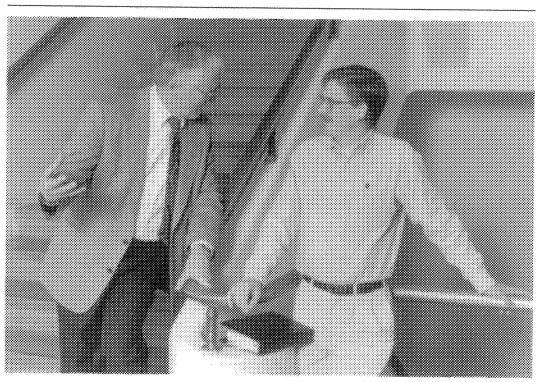
Another aspect of the honors series which allows faculty to take the students deeper into the subject matter is the fact that there is one extra day of lecture each week in the honors organic sequence. Kahr says he often introduces a topic on that day – a particular molecule, a certain scientist, a recent current event – which hopefully expands the students' grasp of and appreciation for key scientific theories. Being stumped is one of the things that Kahr enjoys most about teaching honors students. Sometimes the students will ask such sharp, incisive questions that Kahr needs to research them before he can answer them the next day. In that manner, both professor and student learn from the course.

see *Honors*, con't on page 19

Outstanding Alumnus

Facing the challenge

disease fails to deter chemistry alumnus who, despite the odds, has earned his Ph.D., is raising a daughter, and plays an active role in his community



Herb Lancaster (right) greets one of his doctoral research supervisors, **Professor Gary Christian** during a return visit to Bagley Hall.

Chemistry and faith form much of alumnus Herb Lancaster's bedrock as he begins his 38th year living with cystic fibrosis (CF).

The UW Ph.D. in chemistry he earned in 1995 has allowed him to understand his disease more fully. As such, he can take more control over his healthcare by evaluating information quantitatively. His chemical knowledge also allows him to be very discriminating about the FDA drug trials in which he participates, only selecting those where he believes the science is solid.

Religion has allowed him to cast off the fear of dying and to embrace life. He knows that the average lifespan for CF patients is 29 years and he has already seen two cousins die from the disease at ages 18 and 21.

But for the extended sick-leaves that CF occasionally necessitates, you could easily confuse Herb with your average "Type A" businessman. He usually works six days a week, up to 14 hours a day. His entreprenurial side surfaced before graduate school, when he founded a scientific slide manufacturing company. His second company manufactured interfaces for computers which improved the automization of flow injection instrumentation.

This type of work is a logical extension of his doctoral research into the enhancement of instrumental methods by flow injection analysis. He used FIA on preconcentrations of trace metals and observed the quantitation of metals by atomic absorption spectroscopy. Herb's work, which was supervised by Professors Gary Christian and Jarda Ruzicka, also was of interest to the Center for Process Analytical Chemistry (CPAC), as he developed a sequential sensor injection which can be used in process streams. Herb earned his undergraduate degree in chemistry from the UW and did research during those years with Professor Norm Rose.

Herb most recently started a chemical consulting business called Analytical Devices, Inc. in Lynden, WA, three miles south of the Canadian border where he and his family now live. Some of his work involves applying chemometrics to pulp and paper instrument manufacturing. Herb has occasionally worked for others but much prefers self-employment.

All this comes in addition to helping his wife home-school their nine-year-old daughter and teaching chemistry to other children in the town who are similarly educated. There is also the pastoral intern program he's involved with at church, which may someday lead Herb, himself, into the clergy. Herb lives his life at a high pitch, filling each day with as much as he can while he has the health to do so. He calls his cell phone his "fifth appendage" and logs nearly 1900 minutes a month on it.

Even though Herb must spend up to two hours every night clearing his lungs, he emphasizes that he is not limited physically too much by CF. He rock climbs, swims, and bike rides. He could even run a marathon if he wanted, but he'd have to pace himself carefully because he tires easily. Herb has been to Europe several times and he just returned from

the Middle East with a church group. He hopes to someday finish his work toward a black belt in karate and also fantasizes about climbing Half Dome or El Capitan in Yosemite Canyon.

When the disease is in an active state Herb is flat out in bed, often for months at a time. For many years the causes of CF were a mystery, but today scientists know humans have a gene encoded in their DNA which manufactures a special protein called CFTR. This protein controls the flow of chloride ions across the cell membrane. Each person has two CF alleles in each gene; a single correctly encoded allele is adequate for normal CFTR production. Thus it is only when a person has two defective CFTR alleles that they actually have cystic fibrosis. Those with a single defective allele are called "carriers" and are normal. The CF gene and the positions of its various mutations were identified in 1990. About 5 percent of white Americans are asymptomatic carriers.

People with CF suffer from chronic lung problems and digestive disorders. While everyone produces some mucus in their lungs, the mucus in people with CF is too thick and viscous to be pushed up by the body. As a result, the mucus builds up and provides a hospitable environment in which bacteria can thrive. This, in turn, engenders an immunological response from the body's white blood cells, which race to the scene, beat up the bacteria and promptly die. The protein which is left after the cells die can now be fought off by a relatively new drug called Pulmozyme (or DNAse, developed by Genentech's Dr. Steve Shak), the first medication made specifically to address the problems of the CF lung, and one of the first biotechnology drugs. The concentration of dead white blood cells is approximately 1000 times larger in people with CF than it is in the normal lung. This compound aims to break up sputum by digesting long, sticky strands of DNA released from dying cells.

Those suffering with the most serious form of CF, as is Herb, have additional problems. Among them, the ducts in the pancreas that deliver digestive enzymes to the intestines almost always become occluded, impairing the body's ability to break down food and extract nutrients from it. Luckily, pancreatic enzyme supplements are now available to treat this condition. Although even with the supplements, people with CF absorb food less efficiently than normal adults and can easily become malnourished and have trouble gaining weight. There are approximately 30,000 people in the United States with CF.

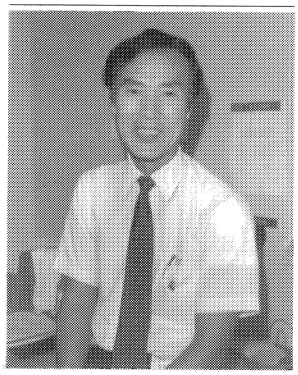
Despite the progress scientists have made, none of the approved treatments can yet correct the biochemical abnormality at the root of cystic fibrosis, and none can remove the specter of an early death.

Herb knows that he has the option of a lung transplant should his medications lose their efficacy. Since the transplanted tissue would not have the inherited genetic defect, excess mucus would not build up there. But, Herb is sure there will be time to consider that later. Right now, he's going back to work.

Alumni

anecdotes, accounts, and annals

George Blomgren (Ph.D. 1956) was recognized by his colleagues twice last year for outstanding scientific achievement. The International Battery Association presented him with their Research Award last fall in France and at the start of winter, he was given the Battery Technology Award from the Battery Division of the Electrochemical Society. George retired last fall after 42 years with EverReady in Ohio. He now travels frequently as part of his new consulting business and he's an adjunct professor at both Case Western Reserve and Carnegie Mellon universities. **Seth Brown and Marya Lieberman (Ph.D.s 1994)** each did a postdoc at Caltech after graduation. Their son, Galen, is three years old. Both Seth and Marya are assistant professors at the University of Notre Dame.**Tom Crevier (Ph.D. 1998)** is a chemist and computer scientist at Symtx Technologies in Santa Clara, CA. **"Wild" Bill Dasher (Ph.D. 1981)** is on sabbatical this year from his job as chairman and professor of chemistry at the University of Puget Sound. He is spending the year in UW Professor Karen Goldberg's lab learning organometallic chemistry. **Jordan Ferrier (B.S. Chem, June 1997)** is finishing up a master's in enology at the University of California at Davis. While an undergraduate he worked in Professor Frank Turecek's lab and was very active in the Free Radicals, the undergraduate club for chemistry and biochemistry majors. **David Fine (Ph.D. 1996)** is a research chemist at PGP Industries, Ltd. in southern California. He and his wife have a one-and-one-half year old son, Isaac. **Kim Gardner (Ph.D. 1996)** is teaching at the Air Force Academy in Boulder, CO and has



Bryan Chung (Ph.D. 1971) followed his graduate work at the UW with the late Professor George Cady with a postdoctoral position at MIT. After working for a short time at 3M, Bryan joined AT&T Bell Labs, where he stayed for 18 years. Two years ago, after the split-up of AT&T, Bryan joined the microelectronic division of Lucent Technologies, where he is involved in the manufacturing of integrated circuits.

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Doctoral Graduates (Autumn 1996 – Spring 1998)

Rashed M. Al-Othman, "Flow Injection/Sequential Injection Separation and Preconcentration: Diffusion Denuders as Renewable Separative Surfaces in Flow Injection Analysis," Gary D. Christian, Summer 1997

Stephen C. Alley, "The sequence-dependence of DNA flexibility," Paul B. Hopkins, Autumn 1996

Brian B. Anderson, "Grating light reflection spectroscopy," Bruce R. Kowalski, Autumn 1996

Carsten A. Bruckner, "Rapid chromatographic analysis using novel detection systems and chemometric techniques," Robert E. Synovec, Spring 1998

John R. Cort, "Peptide and protein structure in aqueous hexafluoroisopropanol: I. Monomeric and beta-aggregate forms of human amylin. II. Cold denaturation of alpha-helices," Niels H. Andersen, Autumn 1997

Thomas J. Crevier, "Oxidation and reduction of small molecules by tungsten and osmium complexes," James M. Mayer, Spring 1998

Jeffrey Delrow, "Evidence of alternative secondary structure states in DNA: simulations and experiments," J. Michael Schurr, Autumn 1996

Darin D. DuMez, "Synthesis and selective oxidations of rhenium hydrotris-(1-pyrazolyl)borate compounds," James M. Mayer, Spring 1997

Oleg B. Egorov, "Automation of radionuclide separations and analysis by flow injection techniques," Gary D. Christian/Jaromir Ruzicka, Spring 1998

David A. Fine, "Structure and reactivity of dinuclear complexes of iridium," D. Michael Heinekey, Autumn 1996

Paula Fischhaber, "DNA-protein interactions: investigations at the molecular interfaces of two systems," Paul B. Hopkins, Spring 1998

Marc D. Foster, "Liquid chromatographic separation and sensing principles with a water-only mobile phase," Robert E. Synovec, Autumn 1996

Lara J. Gamble, "Organofunctionalization of oxide surfaces with alkoxysilanes: model studies on TiO2(110)," Charles T. Campbell, Autumn 1996

Karen B. Geahigan, "A solid-state NMR investigation of structure and dynamics in nucleosides and methylated DNA oligonucleotides," Gary Drobny, Spring 1998

George R. (Rick) Geier, "The preparation of a metalloporphyrin-peptide conjugate artificial protein for the catalytic oxidation of alkenes," Tomikazu Sasaki, Summer 1997

Susan L. Harder, "Deposition of sulfate aerosol and isotopes of berylium to the Antarctic snow surface and implications for ice cores and climate," Robert J. Charlson, Autumn 1996

John N. Harris, "Referenced pressure and temperature sensitive coatings using solid state phosphors," Martin Gouterman, Winter 1998

Kazuo Hirai, "Time-energy analysis of molecular vibrational spectra," William P. Reinhardt, Summer 1997

Michael C. Jacobson, "Integrated theoretical and experimental studies of organic atmospheric aerosols," Robert J. Charlson, Autumn 1997

Suzanne Kiihne, "Development and application of multidimensional dipolar recoupling methods for distance measurement in nucleic acids," Gary Drobny, Spring 1998

David W. Kuhns, "The viability of multiple bubble sonoluminescence for analytical measurements," Bruce R. Kowalski, Spring 1997

Li Liu, "Purification and characterization of a protein palmitoyltransferase that acts on H-ras protein and on a C-terminal N-ras peptide," Michael H. Gelb, Autumn 1996

Thomas A. Luther, "Dicationic dihydrogen complexes of osmium and ruthenium," D. Michael Heinekey, Summer 1997

Gregory J. Mills, "A general formulation of quantum transition state theory," Hannes Jónsson, Autumn 1996

Paul R. Mobley, "Using *a priori* information to produce more effective, automated chemometrics methods for extracting information from analytical chemistry data," Bruce R. Kowalski, Spring 1997

Warren Oldham, "Dihydrogen complexes of rhodium and iridium," D. Michael Heinekey, Autumn 1996

Nels A. Olson, "Development of an analyzer for surface active species in flow injection and liquid chromatography environments," Robert E. Synovec, Autumn 1997

Brian O'Regan, "Dye sensitized n-p heterojunctions of titanium dioxide and copper thiocyanate: a new interface for photoinduced charge separation," Martin Gouterman, 1998

Astrid Perez-Clark, "An application of near-infrared spectroscopy for the determination of biomass viability," Bruce R. Kowalski, Spring 1998

Kristina L. Peterson, "Advances in flow extraction techniques: applications in forensic toxicology," Gary D. Christian/Jaromir Ruzicka, Spring 1997

Catherine E. Radzewich, "Activation of small molecules by cationic rhenium complexes," D. Michael Heinekey, Winter 1997

Annabelle Wey Reese, "Analysis of cw-epr spectra and the internal dynamics of DNA," Bruce H. Robinson, Autumn 1996

Tristine M. Samberg, "Interactions of atmospheric particulate and trace gases with clouds at Cheeka Peak, WA" William H. Zoller, Spring 1997

Paul H. Shelley, Jr., "Optical low coherence reflectometry for process analysis," Bruce R. Kowalski, Autumn 1996

Kip P. Stevenson, "Anisotropic potential energy surfaces for atmospheric gases – unsaturated hydrocarbon molecule interactions from differential scattering experiments," Robert O. Watts, Summer 1997

Mirjam Van Roon, "Structure, dynamics and reactivity of hydride complexes of the cobalt and iron group metals," D. Michael Heinekey, Autumn 1997

Kevin D. Walker, "The use of stereospecifically labeled phenylpropanoid compounds to determine the steric course of key reaction steps in the biosynthesis of taxol, hyoscyamine and cycloheptyl fatty acids (*Taxus brevifolia, Datura stramonium*)," Heinz G. Floss, Spring 1997

Bodil Willumsen, "Kinetics of biological binding studied by flow injection fluorescence microscopy," Gary D. Christian/Jaromir Ruzicka, Summer 1997

Surya Wiryana, "Properties of water and aqueous solutions at high temperature and pressure," Leon J. Slutsky, Spring 1998

Jun Yoshihara, "Model copper/zinc oxide catalysts for methanol synthesis: the role of surface structure," Charles T. Campbell, Autumn 1997

Master's Graduates (Autumn 1996 – Spring 1998)

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Jeffrey A. Marks (Gary D. Christian/Jaromir Ruzicka) Winter 1997
Diane Nagahara (D. Michael Heinekey) Spring 1997
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Shannon L. O'Hogan (Heinz G. Floss) Summer 1997
Joy E. Scott (Leon J. Slutsky) Spring 1998
Melinda A. Haase Vredevoogd, Winter 1997
Christopher Way (Heinz G. Floss) Autumn 1996

Undergraduates (Autumn 1996 – Spring 1998)

Bachelor of Arts in Chemistry

Adams, Raymond P., 8/97
Amera, Gashaw, 6/97
Arnold, Meredith C., 6/98

Chang, Joon H., 6/97
Cheslak, Evelina, 6/98
Crampton, Shon Lee, 6/97
Drumm, Jeanne C., 8/97
Ecker, Scott, 3/98
Fishel, Shelly L., 6/97
Gerads, Russell T., 8/97
Giap, Binh P., 6/97
Giles, Andrea, 6/98
Hale, David M., 12/96
Humleker, Alexandra , 3/97

Karchesy, Thomas, 8/97
Kim, Greg, 6/98
Kim, Won J, 6/98
Kolasa, Marzena, 6/98
Kun, Franklin, 6/97
Lin, Susan S., 6/98
Ly, Loreena P., 12/96
Nagy, Hillary A., 6/97
Nettleback, Joshua, 3/97
Ngo, Lynn, 6/98
Nguyen, Anh, 3/97
Nguyen, Lehong T., 6/98
Nguyen, Thy, 6/98

Pierson, April A., 3/97
Pon, Florence R., 8/97
Seabaugh, Mark A., 12/97
Shipley, Anna C., 6/98
Tawatsin, Anuda D., 3/97
Trevino, Sally A., 6/97
Westby, Shane G., 12/97
Zylowski, Walter J., 6/97

Bachelor of Science in Biochemistry

Allen, Kathrin J., 12/97
Aminikharrazi, Taher, 6/97
Arikawa, Karen Y., 6/98
Avicola, Amy K., 6/97

Badyal, Manpreet Singh, 6/98
Bahmandar, Parvaneh, 6/97
Barash, Ilona A., 6/97
Baullinger, Jill K., 3/97
Bender, Sean, 6/97
Blake, Julia L., 6/97
Blankenship, John W., 6/97
Blasi, Jennifer, 6/98
Boulos, Maha M., 6/98
Brodsky, Yan, 3/98
Bruce, Doo Souson, 6/97
Brugos, Christopher, 12/97
Bruinsma, Todd A., 6/97
Bryant, Zev D., 3/98

Chan, Lily Y.N., 6/97
Chang, Dooyong, 6/98
Chapman, Matt J., 8/97
Charurat, Bella S., 12/96
Chen, Eleanor Y., 8/97
Chen, Emily H., 3/98
Chen, Hank H., 6/98
Chen, James, 3/98

Cheung, Elizabeth Y., 6/97
Choe, Song Han, 6/97
Choi, Peter S., 6/97
Chou, Chung-Jen, 6/98
Coates, Melissa M., 6/97
Cole, Leslie J., 6/98
Costales, Michelle, 6/98
Cranmore, Todd Alan, 6/97
Crawford, Douglas K., 6/98

da Ponte, Suzanne, 6/98
Davis, Joseph W., 6/98
Dewey, Denise M., 6/97
Dimak, Amy M., 6/98

Ferara, Nancy, 6/98
Flaim, Michael S., 6/97
Frame, Elizabeth R., 12/96
Freeman, Robert, 3/97
Fung, Scott C. K., 6/97

Gadbois, Stephanie, 6/98
Gleason, Catherine E., 6/97
Gould, Jessica L., 8/97
Gover, David C., 12/96
Grewal, Prabhjot K., 6/98

Habib, Natasha, 3/98
Harder, Brandon J., 6/97
Hardie, David C., 6/97
Harrell, Maria I., 6/98
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Hathaway, Tanya R., 6/97
Hawkins, Victoria C., 6/97
Hayward, Robert M., 6/97
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Hsieh, Candace, 6/98

Inclan, Yuko F., 6/98
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Johnson, Heather M., 8/97
Johnson, Theron S., 12/96
Ju, Sung Hoon, 6/97

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Keasey, James B., 3/98
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Kifer, Shawnna L., 6/97
Kim, Alexander Y., 6/98
Kim, Debora, 6/98
King, Kristine M., 3/97
Klon, Anthony E., 6/97
Kuhl, Marty David, 12/96
Kwok, Keith, 6/98
Kwok, Louisa, 12/97

Lam, Mandy T., 6/97
Le, San D., 6/97
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Lee, Edmond, 6/97
Lee, Kristen, 6/98
Lee, Paul A., 6/97
Lee, Seung H., 6/97
Li, Xi Susan, 3/97
Liaw, Brandon, 6/98
Lin, Karen, 6/97
Lin, Sue Chien-Shy, 12/96
Lineback, Christopher, 6/98
Liss, Anne E., 6/97
Lo, Christina, 6/97
Luedtke, Nathan W., 6/97
Lundberg, Erika L., 6/97
Luu, Quang C., 6/97

Ma, Chieh C., 6/97
Mather, Donald M., 12/97
Mattson, Jason, 6/97
Mc Cann, In K., 6/98
McGilton, Brian, 8/97
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Miller, Brady G., 3/98
Miller, Nicole E., 8/97
Min, George G., 6/97
Mix, Lucas J., 6/97
Morales, Cecile, 6/98
Mosby, Jill C., 6/97
Mueller, Eric C., 6/98
Murphy, Sean J., 12/96

Nakamura, Audrey T., 6/97
Nejad, Shamim H., 12/96
Nekahi, Negin A., 12/97
Ng, Chi Kin Domingos, 6/98
Nguyen, Dang H., 6/98
Nguyen, Giao Q., 6/98
Nguyen, Hoang D. Q., 6/98
Nguyen, Jennifer U., 6/98
Nguyen, Thanh T. H., 6/98
Nguyen, Thuc PQ, 6/97
Nichols, Gina, 3/98
Nili, Mahti, 12/96
North, Ryan, 6/97
Nyhuis, John H., 6/98

O'Neill, Gavin A., 8/97
Ono, Edward H., 6/98
Pak, Chae Ho, 6/98
Palanca, Benjulian A., 6/97
Pangilinan, Ronald F., 6/97
Patel, Rashmi C., 6/97
Payne, Livia A., 6/97
Pearson, Carlo A., 12/96
Petrovan, Simina C., 6/98
Petruk, Lyudmila, 6/98
Pietka, Terri A., 6/98
Pischke, Thomas, 6/97
Pritchard, Colin, 6/97
Pu, Mary W., 8/97
Quach, Ngu L., 6/97

Raden, Brian W., 6/98
Ranz, Shawna M., 12/96
Read, Bob J., 12/96
Robinson, Daniel G., 6/97
Rogosin, Shane, 6/97

Saenz, Adam, 6/98
Schroetlin, Renee, 3/97
Schuder, Laura E., 8/97
Sim, Mi Hyun, 8/97
Slate, Shelley M., 6/98
Sonker, Jason A., 3/97
Spencer, Rebecca J., 6/97
Steinman, Suzanne E., 6/98
Stentz, Carrie L., 6/97
Stickney, Spring, 6/98
Straiker, Alex, 3/97
Strait, Robert B., 8/97
Szalvay, Victor L., 6/98

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Taylor, Melba M., 6/98
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Thorsen, Shelley M., 12/97
Tran, Hung M., 6/97
Tworoger, Michael, 6/98

Uy, Charmaine G., 3/97
Vaughn, Amanda, 12/97
Vaneaton, Erik G., 12/96
Vu, Hao T., 6/97

Waldbaum, Brett A., 6/98
Wallace, Martin C., 6/97
Wang, Henry H., 6/97
Watts, Jonathan S., 6/98
Weinmann, Christian , 6/97
Werden, Scott D., 6/97
Weverstad, Karla J., 6/98
Widner, Jason D., 6/97
Wing, Diane C., 12/96
Woo, In S., 6/98
Woo, Tek W., 12/97
Worthy, Kristin M., 3/97
Wyman, Andrew J., 6/97
Yan, Benjamn, 6/97
Yang, Paul, 6/98
Yeung, Lisa Y. Y., 6/97
Yim, Chong Min, 6/97
Young, Eva, 6/97
Young, Jenna L., 6/97
Yu, Onchee A., 6/97
Yurchak, Randy O., 12/96
Zeki, Amir A., 6/97

Bachelor of Science in Chemistry

Beckman, Robert A., 6/98
Berg, Heather J., 6/97
Borrut, Nathalie, 6/97
Brugman, Johanna, 6/98

Campbell, Paul, 12/97
Cewe, Halina, 6/97
Chaffee, Margaret, 6/97
Devine, Christine, 6/98

Erdahl, Michael L., 6/97
Farrow, Matthew J., 6/98
Ferrier, Jordan G., 6/97
Goles, Christopher, 12/96

Hammersmith, Amy, 6/97
Hance, Timothy M., 12/96
Hastings, Matthew, 12/97
Holland, Andrew, 6/97
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LaTurner, Solveig S., 12/96
Monroe, Brett G., 6/98
Nance, Aaron P., 6/97
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Rehfuss, Constance S., 12/96

Schumacher, Frank, 12/97
Scott, Joy E., 6/97
Scott, Stephen, 3/98
Smith, Kristina M., 3/97

Thai, Alice N., 6/97
Walker, Kelly, 6/98
Youngberg, Daron A, 6/98

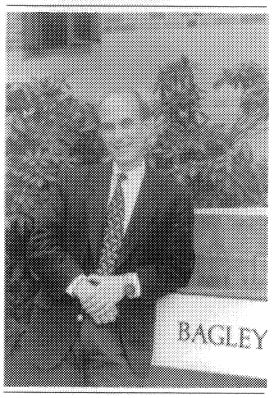
Bachelor of Science degrees in Chemistry and Biochemistry

Berg, Heather, 6/97
Nakamura, Audrey, 6/97
Olsen, Gregory L., 6/98
Uy, Charmaine, 3/97

Harry B. Gray, 1997 Cady Lecturer

For his contributions to bioinorganic chemistry and inorganic photochemistry, the 1997 Cady Lecturer, Harry B. Gray, received the National Medal of Science from President Ronald Reagan in 1986. Gray is also the holder of 12 honorary degrees, and his recent awards include the AIC Gold Medal, the Pauling Medal, the Gibbs Medal, the Waterford Prize, the Bader Award, the Priestly Medal, and the Linderstrøm-Lang Prize. Gray is the Beckman Professor of Chemistry and the Director of the Beckman Institute at the California Institute of Technology, which he joined in 1966 after five years on the faculty at Columbia University. Gray was elected to the National Academy of Sciences in 1971. His Cady Lecture was entitled "Electron Transfer in Biological Molecules" and dealt mainly with his work with metalloproteins.

Stephen J. Lippard, 1998 Cady Lecturer

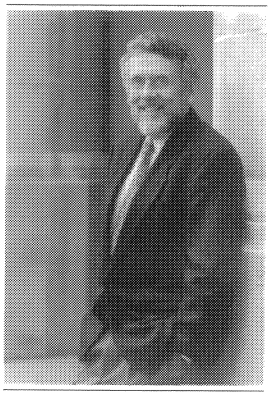


Much of what we know about a widely-used anticancer drug, cisplatin, can be traced to the laboratories of the 1998 George H. Cady Lecturer Professor Stephen J. Lippard. Lippard holds the Arthur Amos Noyes chair in the Department of Chemistry at the Massachusetts Institute of Technology. His research activities span the fields of inorganic and biological chemistry and includes structural and mechanistic studies of platinum anticancer drugs and of methane monooxygenase, the synthesis of carboxylate-bridged dimetallic complexes as models for redox-active enzymes and metallohydrolases, and probes for the neurochemical functions of zinc, calcium and nitric oxide. Lippard has authored or co-authored over 450 articles, is the recipient of numerous prizes, and has chaired the MIT chemistry department since 1995.

George M. Whitesides, 1998 Dauben Lecturer

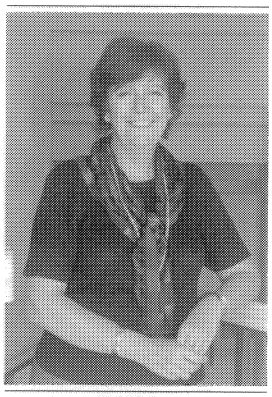
Harvard's Professor George M. Whitesides' 1998 Dauben lecture was on the "Self-Assembly Methods for Molecules Applied to the Meso-Scale." It was an overview of his broad-ranging work in biochemistry, surface science, materials science, molecular virology, optics, self-assembly, and organic synthesis. Whitesides is a member of the National Academy of Sciences and has won numerous prizes, including the ACS Pure Chemistry Award, the Norris Award in physical organic chemistry, a Cope Scholar Award, and the Madison Marshall Award. Whitesides was a professor at MIT from 1963 until 1992, when he joined the faculty at Harvard, where he is currently the Mallinckrodt Professor of Chemistry.

Philip E. Eaton, 1999 Dauben Lecturer



"The Impossible Just Takes a Little Longer" was the title of the 20th annual Hyp C. Dauben lecture given earlier this spring by Professor Philip E. Eaton of the University of Chicago. He spoke of some of the impossibly strained reactive intermediates (including cubyl carbocation, cubene, and 1,4-dehydrocubane) that he has succeeded in generating in the cubane skeleton. Eaton is a recognized world leader in the synthesis and characterization of non-natural products, chosen to probe the effects of molecular structure on bonding and reactivity. He is an AAAS Fellow, as well as a past Sloan Foundation Fellow. Among Eaton's other honors are a von Humboldt prize and a Cope Scholar Award.

Julia S. Higgins, 1998 Cross Lecturer



"Wriggling Through: The Motion of Very Large Molecules" was the subject of last year's Cross Lecture by Julia S. Higgins, professor of polymer science and dean of the City and Guilds College (Engineering Faculty of Imperial College, University of London). Dr. Higgins' work has applied a wide range of spectroscopic and scattering techniques to investigate the dynamics and structures of polymer molecules in bulk, in solution, in polymer blends, in liquid crystalline phases, and in the presence of shear flow. Higgins is a Fellow of the Royal Society of Chemistry and has received numerous awards. She has been a principal user of the neutron scattering facility at ILL in Grenoble and has been heavily involved in the planning, construction, and use of the ISIS spallation neutron source in England.

Richard R. Ernst, 1999 Cross Lecturer

Nobel Laureate Richard R. Ernst spoke about "The Potential of NMR for the Study of Molecular Dynamics" during his Paul C. Cross Lecture in June of this year. As president of the Research Council at the Swiss Federal Institute of Technology (ETH) in Zurich, Ernst's scientific contributions include the first successful pulsed excitation Fourier Transform NMR experiments, the development of 2- and 3D NMR, Fourier NMR Tomography for medical applications, multiple quantum spectroscopy, coherence transfer in magnetic resonance, solid state NMR methods, and studies of hydrogen bond dynamics in solids. Ernst also spoke on "Exploring Local Order in Solid Materials by Nuclear Spin Diffusion" during his visit to the department. He won both the Nobel and Wolf prizes in 1991.

1998 Pauling Symposium

From left, **Professors Murray, Bard, Faulkner,** and **Anson**, all "Frontiers in Electrochemistry" symposium speakers. **Bard's** talk was entitled "Electrogenerated Chemiluminescence—From Antibodies to Hot Electrons."

The 33rd Pauling Award Symposium was hosted by the Department of Chemistry on November 21, 1998. The Pauling Medal recipient, Professor Allen J. Bard of the University of Texas in Austin, is renown for his discovery of electrogenerated chemiluminescence. In addition to Professor Bard, other symposium speakers included Dr. Larry R. Faulkner ("Electrochemistry's Third Century"), whose Ph.D. was supervised by Professor Bard and who is now president of the University of Texas at Austin; Professor Fred Anson ("Electrochemical Applications of Thin Layers of Immiscible Organic Solvents Interposed Between Graphite Electrodes and Aqueous Solutions") of the California Institute of Technology; and Professor Royce W. Murray ("Voltammetry in Semi-solid Molecular Melts") of the University of North Carolina in Chapel Hill. UW Chemistry Chair Paul B. Hopkins was the medal chair and Professor Martin Gouterman was the symposium chair. The UW last hosted the Pauling Symposium eight years ago. In noting that approximately one-third of former Pauling Medalists have also won the Nobel Prize, Professor Bard jokingly suggested that standards be lowered for the next two years when selecting an awardee, in order to enhance his own chances of becoming a Nobel laureate.

Outstanding Staff

Takes the money and runs

"show me the money" acquires new meaning when financial manager deals with auditors

Randa Knudsen knows a lot about stress. As manager of the department's Purchasing and Accounting Office, and the supervisor of four full-time fiscal staff and a crew of student helpers, it is Randa's responsibility to make sure the chairman stays out of jail and the department stays out of the newspaper. Most of the time, she's successful.

After working her way up the department staff ranks over the last 15 years, Randa now supervises all financial matters dealing with purchasing, travel, grants, contracts, departmental expenditures, donations, and the chemistry stockroom.

Because the Department of Chemistry is so large and receives money from many different federal funding agencies, it is extremely visible to internal and state auditors. Randa makes sure the department complies with all the rules (which are constantly changing), sees that all faculty accounts balance (a true challenge), tries to guarantee that we don't overspend, and perhaps most importantly, constantly monitors allocations to ensure that monies are spent within the appropriate time frame.

Faculty don't always understand what is allowable and not allowable on particular kinds of grants so she frequently advises them and reviews their expenditures. Payroll is also challenging because different funding sources have different rules and even within the same funding source, there can be discrepancies and exemptions of which she needs to be cognizant.

This mother of four and grandmother of one claims that her calm exterior hides an aggressive core which she releases on the soccer field, playing for the last 13 years on a team of young-at-heart but now middle-aged women. After four years as the goalie, Randa now plays the forward position, where she thinks she can do the least damage to her body and to her team's efforts. Although, she does recall getting confused on the field once and scoring a goal for the other team.

Randa's ten-year old keeps her busy attending Little League games and Boy Scout retreats. In her former life (the pre-children days), Randa enjoyed raising and showing golden retrievers, as well as participating in snowmobile races in Alaska, one of the many places she lived as the daughter of a military policeman. She also has volunteered with the Special Olympics, helping people with multiple sclerosis compete in bowling tournaments.

It's definitely the supportive and friendly people in the department who have made Randa loyal to Bagley Hall. It's certainly not the accommodations. Before moving into their renovated space a few years ago, the P&A office was located in a windowless, basement office which was stifling in the summer but necessitated wearing mittens and coats in the winter. To add insult to injury, the room was located under the water pipes and pumps leading to Drumheller Fountain. The office had its own version of Muzak as the calming sound of swooshing water moved through the pipes about four hours every day.

Donations Continue to Fund Vital Departmental Activities: Fellowships, Scholarships, Recruiting, Research Symposia, etc.

The following individuals, corporations, and foundations donated to the Department of Chemistry between **January 1997 and June 1998**. Chair Paul B. Hopkins expresses appreciation on behalf of the department for the generous support of all its donors. He urges people to call him at 206-543-1613 or email him at chair@chem.washington.edu if any gifts were omitted from this list or if names have been inadvertently misspelled.

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Barany, John S.
Barker, John R. and Jill R.

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Ben, Victor R. and Becky
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Bonser, Douglas J. and Lora C.
Borden, Weston T.
Borman, Cornelius H. and Catherine B.
Boss, Wendy F. and Charles
Braun, Robert L. and Patsy M.
Breazeale, Jack D. and Donna L.
Brewster, Betty M.
Buchanan, Gary L.
Burger, James E.
Butenko, E. Robert and Charyl Ohrberg Butenko
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Campbell, Roger O. and Kay E.
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Carver, Kristin Ritter and Robert C.
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Collias, Eugene E.
Colwell, Jack H. and Rita R.
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Conry, Rebecca R. and Donald M.
Crary, Pamela Nalli and Steven
Critchfield, Jessica Blake
Cross, Carroll E. and Janet S.
Dabbs, Daniel M. and Joni M.
Davidson, Reba F. and Ernest R.
Davis, Raymond A. and Leila
Denney, John D. and Julie A.
DeRocher, Ernest J. and Amy E.
Deroy, Steven C.
Dettmer, Franz H. and Anne J.
Diesen, Ronald W.
Dillon, Richard R. and Beverly A.
Dorn, Thomas F. and Sara R.
Douglas, John E.
Downie, Katherine E.
Duffy, Patrick F. and Joyce A.
Dunn, Teresa J. and James A.
Dunne, Thomas G.
Eggers, Vera D.
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Elliott, Dennis L.
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Fey, Edmond O. and Cathy
Fike, Robert R. and Suzanne T.
Finke, Stuart W. and Ann M.
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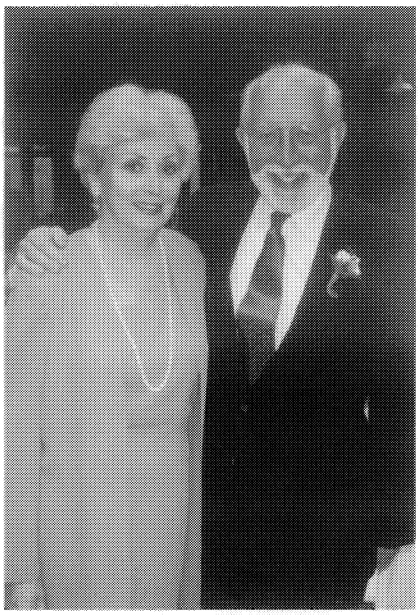
Major Gifts to Chemistry



Gerald (Ph.D. organic chemistry, 1957) and **Sheila (B.A. English, 1955) Berkelhammer** have recently endowed a book fund in the Department of Chemistry. The money generated from the endowment will augment the department's library acquisitions, fund the yearly book prizes given to deserving students, and provide funding for other departmental needs. Jerry wanted to give something back to the place which made his career possible.

In support of excellence, new faculty member **Larry Dalton** and his wife, **Nicole Boand**, have endowed a new professorship in the department. Dalton's years as a professor have shown him that the day when universities could rely ***just*** on state funds is over. Dalton and Boand also believe an ***already*** good department can become a world-class department with these kinds of private gifts. The two hope to establish more professorships in the future in the UW Department of Chemistry.

Lloyd H. (Ph.D. 1939) and **Florence West** are long-time donors to the department. The Wests have recently given a sizable amount of appreciated stock to fund a new endowment, which is unrestricted so as to give chemistry chairs maximum flexibility. The fund is in honor of West's research mentor, the late Professor Rex Robinson. Several years ago, the Wests endowed a graduate student fellowship, also in honor and memory of Dr. Robinson.

Generous spirit and penetrating intellect tell the story

Former chemistry chair Verner Schomaker died on March 30, 1997 in Pasadena, CA from pancreatic cancer.

Schomaker was born on a farm in central Nebraska. He received his B.S. degree in chemical engineering from the University of Nebraska in 1934, and the following year he earned an M.S. degree. In 1938, he was awarded the Ph.D. degree at the California Institute of Technology for his studies on electron diffraction with Professor Linus Pauling. While his scientific and personal association with Pauling continued until Pauling's death in 1994 at the age of 93, the most significant of these relationships formed when Schomaker married Pauling's secretary, Judith Rooke, in 1944.

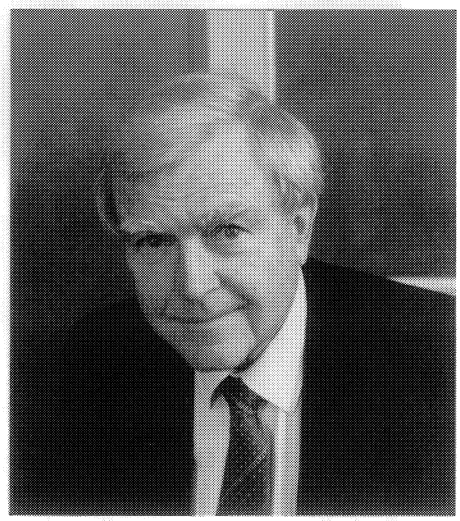
After receiving his Ph.D., Schomaker stayed at Caltech for several more years in different capacities. He received a Guggenheim Fellowship but because of World War II, during which he worked on war projects, he wasn't able to take advantage of the fellowship until several years later. In 1945, he was made an assistant professor of chemistry at Caltech and finally he and his wife were able to set sail on the Queen Elizabeth I for Europe. Most of that year was spent in Professor Niels Bohr's Institute for Theoretical Physics in Copenhagen. Schomaker was appointed professor of chemistry at Caltech in 1950.

His contributions to science were widely recognized. He received the ACS Award in Pure Chemistry in 1949, and served as president of the American Crystallographic Association 1961.

In 1958, Schomaker left academia to join the Union Carbide Research Institute (just north of New York City), where he spent seven years. He eventually returned to academic work in 1965, becoming chair of the UW Department of Chemistry for five years. He became professor emeritus in 1984. After Schomaker's retirement, he was also a faculty associate at Caltech, dividing his time about equally between Pasadena and Seattle.

In his work at the UW, Schomaker united his strength in x-ray diffraction with an interest in catalysis derived from his years at Union Carbide. He carried out studies on the structure of natural and synthetic aluminosilicates (zeolites), some of which are important catalysts for petroleum cracking in the production of gasoline, as well as for a wide variety of organic reactions. He and his students studied the crystal structures of naturally occurring, as well as synthetic, faujasite crystals. By his usual insistence on high quality, he was responsible for the acquisition of data that were equal or superior to the best previously obtained. This made an important contribution to the knowledge of zeolite framework structure and cationic composition which, in turn, added substantially to the understanding of zeolite function. Schomaker also continued work on the molecular structure of coordination compounds and metallo-organics – much of it in collaboration with Professor Edward C. Lingafelter, his longtime colleague in the UW chemistry department.

The late Kenneth Trueblood wrote that *"Every scientific question seemed to interest Verner, and anyone with a knotty problem was welcome at his always-open door. And his time was always yours until he, at least, understood in some depth what you were asking, and preferably you did, too. The answer did not, of course, always come in one session even though the sessions could last for many hours, past meal times and past other appointments that you forgot about because you were so engrossed. His memory was prodigious, and when he encountered a problem he 'worried it,' like a dog with a bone. He might not have all the insight he wanted when the question was first raised, or even during the next few days or weeks but he wouldn't forget. You might encounter him some years later, and he'd say: 'I've been thinking about what you said, and .....'*



"In the 40s and 50s, many who had worked with him felt complimented when he would say 'How can you be so !$%&! stupid?,' since we realized that he expected us to understand and that, frustrated though he might be with our slowness, he would not give up until we understood, or left. In his later years, he learned patience and mellowed somewhat. . . but never, and I do mean never, was there any animosity involved in what might seem to some to be harsh remarks. Nor did Verner's own ego ever intrude. He was selfless, far more so than almost anyone imaginable with his level of intellect and accomplishment. He was interested in getting things right, not in who got the credit, and was never afraid to admit his errors and his own limitations, although he overestimated them (as he, generously, did the abilities of some of his collaborators)."

Schomaker is survived by his wife, two sisters, three sons, and eight grandchildren. His family requests that donations in his memory be made to help establish the Verner Schomaker Endowed Fund, care of the chair in the UW Department of Chemistry.

Honors, con't from page 5

Honors Physical Chemistry

Honors physical chemistry redux, that is.

At one time, the department offered three quarters of honors physical chemistry but when a downturn in the state budget necessitated cuts in the instructional program a number of years ago, these courses were discontinued.

Hopkins was able to offer the return of honors physical chemistry with the support of enthusiastic faculty. And while none of the faculty who currently teach the series was here during the lean times, they all agreed that a legitimate honors program needed to have a stronger presence of physical chemistry.

As with honors general and organic chemistry, this set of classes uses different texts than its non-honors counterparts. The course in quantum mechanics, taught by Professor Hannes Jónsson, is heavily computational, while the other two courses, most often taught by Professors Phil Reid and Charlie Campbell, stress different skills. Reid relies heavily on the internet and even offered his take-home final exam to the students via the Web.

Reid says that teaching honors students is like working without a net, in that the conversation can turn on a dime toward a tangent not necessarily set to be covered in his notes. He can respond to students' comments so much more quickly in a small-group setting and with honors students, he knows they are making connections between what they are learning in his course and material they've learned in prior physics and math courses. These students establish a relationship between topics and don't compartmentalize subjects as much as he finds other students do in non-honors courses.

To ensure that honors courses meet the higher standards expected of them, the faculty also need to work that much harder. Reid said he's often exhausted after an honors course and that he rarely leaves class right after the bell because students are still asking questions. But, because he knows his students put in the extra effort to understand the material, he can do no less in meeting his responsibility to them.

UG Research

The honors equation doesn't balance, however, until undergraduate research is added. Some people insist that research has a greater impact on a student's life than the courses needed for the degree. Students learn how to work as part of a team, they learn to work independently, they learn to deal with seemingly insurmountable challenges, they learn from their mistakes, they gain confidence, they polish their writing skills, they mature.

Now, with a procedure in place which systematically identifies the best students by the end of their first year in the honors program, Kahr meets individually with the students. He tries to match them with mentors, taking into account each person's scientific interests and personality, hoping that each faculty/student match will result in a long-term research relationship. Kahr believes this approach smooths the path toward undergraduate research, making it a more efficient process.

1999 Chemical Sciences Fellows are, from the left in the front row: **Paul Blainey** (junior chemistry major working with **Professor Phil Reid** on ultrafast spectroscopy), **Daven Henze** (junior pre-engineering major studying chemical bonding theory with **Nick Epiotis**), **Rachel Kuhn** (junior general studies major working on cell metabolism with **Craig Beeson**), and **Daniel Fredrickson** (senior biochemistry major researching crystal growth with **Bart Kahr**). On the stairs from the top: **Jennie Thomas** (senior chemical engineering major working with **Wes Borden** on the synthesis of radical anion precursors), **Brad Ornstein** (junior biochemistry major examining peptide structure with **Tomi Sasaki**), **Noel Fitzgerald** (senior chemistry major doing atmospheric chemistry/remote sensing by FTIR with **Richard Gammon** and **Michael Yost**), and **Stephen Lin** (senior biochemistry major looking at mutant identification with **Ted Young**). Not pictured is **Stephen Ching** (junior biochemistry major studying RNA chemistry with **Snorri Sigurdsson**).

A further subset of these honors students has been selected to become Chemical Sciences Fellows. Their full-time summer research is funded, making outside summer employment unnecessary. The expectation is that these students will work in an industrial or government research laboratory during subsequent summers in order to gain experience in the non-academic world of science. The summer research program has no permanent source of support and currently costs the department approximately $40,000 from private gift funds. An endowment would guarantee the program's future.

While the benefits accruing to honors students is undeniable, there is a danger when you take the really good students out of a class which spans the full spectrum of academic potential. Other students are without role models and there is no peer who can spur them to work at a higher level. Very bright students are a resource for faculty, helping to inspire other students with their in-class questions or comments.

Reid hopes that some of the pedagogy he has learned in the past few years by teaching honors students can be applied to a non-honors course. That's why he is purposely planning to teach the regular version of quantum mechanics next year, in an effort to implement what he has learned in a small-group setting. As he scales up to a larger class, he hopes some of his new approaches can be modified so that non-honors students will realize the trickle-down effect of the honors program.

Alumni, con't from page 7

recently had her first child, Ethan. Kim is also one of the organizers of the U.S. Chemistry Olympiad training program at the Air Force Academy. **Jennifer Holmes (Ph.D. 1993)** is now a senior scientist at Floyd and Snider, Inc. in Seattle. They do environmental consulting and create viable solutions for remediating contaminated materials. One of her current projects includes helping to remediate land at SeaTac Airport in order for the concourse to be expanded. Jennifer is also working on the disposal of wood debris in the dredging of local waterways, including Commencement Bay in Tacoma. **Hui Fang Huang (Ph.D. 1995)** is an assistant professor in the Department of Biochemistry at the University of Illinois, Urbana/Champaign. **Jeff Jagmin (B.S. Chem, June 1995)** is working as a forensic scientist at the State Patrol Crime Lab in Tacoma, WA. **Janet Kavandi (Ph.D. 1990)** will be aboard the space shuttle **"Endeavor"** this September when it undertakes an ambitious mission to map the Earth's surface. During the mission, the crew will use specialized radar equipment and other electronics to map 80 percent of the Earth's land mass, extending from the southern tip of Greenland to the northern edge of the Antarctic Circle. Data will be collected every 90 feet and should be accurate to within 30 feet of the height of the terrain. Janet's first shuttle flight on **"Discovery"** last year was NASA's final Shuttle-Mir docking mission, concluding the joint U.S./Russian Phase 1 Program. Janet became an astronaut in 1994. **Walter Loveland (Ph.D. 1966)** was part of the research team at Lawrence Berkeley Laboratories which recently discovered two new "superheavy" elements. Element 118 and its immediate decay product, element 116, were discovered using Berkeley's 88-inch Cyclotron by bombarding targets of lead with an intense beam of high-energy krypton ions. Walt was on sabbatical this past year from Oregon State University. **John Lund (Ph.D. 1954)** and his wife traveled with the UW Alumni Association last year to the North Pole. They boarded a nuclear-powered Russian ice breaker in Murmansk, 1200 miles from the Pole. The last 600 miles required smashing through thick ice but once there, the ship stopped at the Pole for a celebration – permitting a few brave souls (not John, however) to take a quick dunk in the freezing ocean. The Lunds have also traveled with UWAA on trips around Cape Horn, the Falkland Island, the British Virgin Islands, and the Grenadines in the Caribbean. John retired in 1992 after 38 years with du Pont. **Ramesh "Ramey" Rao (B.S. Chem, June 1995)** is currently in dental school at the University of Washington. After graduation Ramey worked at a winery in Oregon and then traveled to Australia to work the grape harvest. **Stacia Rink (Ph.D. 1994)** is an assistant professor of chemistry at Pacific Lutheran University. **Miguel Salazar (Ph.D. 1992)** is an assistant professor of medicinal chemistry in the College of Pharmacy at the University of Texas at Austin. His research is on the action of telomerase. This enzyme is a ribonucleoprotein complex and appears to be essential to the survival of cancer cells and thus represents a selective target for antitumor compounds. He and his wife have a year-old daughter, Kristina. **Snorri Sigurdsson (Ph.D. 1993)** is a research assistant professor at the UW. His work on the structure of catalytically active ribonucleic acids is supported by two NIH grants. **Sam and Debbie Tahmassebi (Ph.D.s 1995)** are now living in southern California. Debbie is an assistant professor at the University of San Diego and Sam is starting his last year of night law school at USD. He will continue working at a patent law firm after graduation. Debbie and Sam have two children, Layla, almost four, and Rachel, eight months. **Jonathan Zieman and Mary Beth Seasholtz (Ph.D.s 1992)** are senior scientists at Dow Chemical. They have a seven month old son, Tabor. **Loren Williams (B.S. 1981)** is a tenured professor at Georgia Tech. He and his wife have a five-year old son, Justin.

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