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In This Issue:

Next Issue:

Farewell to Prof. Wes Borden
STC Update
Sarah Keller wins Dayhoff Award
New Faculty Profiles

Dear Friend of Chemistry:

As I write to you, another academic quarter draws to a close. The faculty have prepared and are in the midst of administering final examinations; they will soon be calculating grades. Hundreds of students are scurrying through our hallways going to and from these exams. We hope their diligent preparations will yield outstanding marks. Students and faculty alike will soon take a brief breath then begin again in the new year.

Members of the Department of Chemistry at UW have much to be proud of, and even thankful for, of late. We've long been a great Department, but it hasn't always been as much on display as recently. Sometimes it seems that each passing day provides some new accomplishment for us to laud:

· Assistant Professor Sarah Keller is the 2005 Margaret Oakley Dayhoff Award recipient from the National Biophysical Society.

· Assistant Professor Daniel Gamelin was the only chemist this year to receive a National Science Foundation Presidential Early Career Award in Science and Engineering.

· Assistant Professor Daniel Chiu is the first UW faculty member ever to win a Keck Young Investigator Award and the accompanying $1,000,000 research grant.

· Professor Karen Goldberg and several faculty colleagues won one of three NSF Chemical Bonding Centers awarded this year, beating out many other stellar consortia of applicants.

· In fiscal 2002 (the latest available data) NSF data says our Department was 18th in the nation in research expenditures, beating out powerhouse chemistry departments at institutions including Cornell, Michigan, Northwestern, Purdue, and Yale. Furthermore, we were 10th in the nation among chemistry departments in research equipment expenditures. Watch out Berkeley—here we come!

· In fiscal 2004 Chemistry led the UW in number of invention disclosures filed, the documents that presage patents that indicate our research is useful to others and possibly will even return wealth to support future research and teaching.

· We are now the second largest producer of chemistry and biochemistry undergraduate degree recipients and fifth largest producer of Ph.D.s nationally.

The Department is poised to be even more aggressive in further improving our

See "Chair's Message" on page 6

Chemistry Professor Named Keck "Distinguished Young Scholar"

Vince Stricherz
Republished courtesy of *University Week*

Professor Daniel Chiu does research at the tiniest scales, but he hopes he can help unlock some of medical science's biggest puzzles.

Professor Chiu, an assistant professor of chemistry, was last year named one of five recipients nationwide of $1 million research grants from the W.M. Keck Foundation's Distinguished Young Scholars in Medical Research Program.

See "Keck Award" on page 3

Pauling's Last Graduate Student Honored With Pauling Award

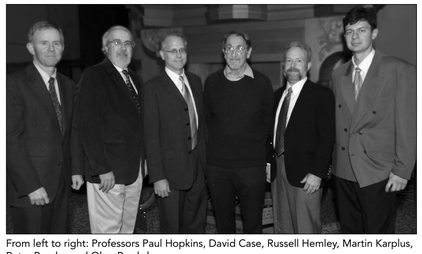
Professor Bill Reinhardt

Introductions and good humor were well supplied by UW Chemistry Professors Oleg Prezhdo and Ernest Davidson acting as session chairs at the 39th Linus Pauling Award Ceremony and Banquet. Professor Martin Karplus, who was Linus Pauling's last graduate student at CalTech, received the honor for his contributions to modern structural biology at a ceremony on October 30 on the UW campus. The first half of the day was dedicated to a scientific symposium given by Professor Karplus and three of his former graduate students.

Professor Russell Hemeley (Carnegie Institution of Washington) led the group with a "Nature of the Chemical Bond" at high pressures tour, which would have made Pauling quite delighted, as many novelties were exposed.

Professor Peter Rossky (University of Texas, Austin) discussed quantum dynamics of fluids, prompting a lively and stimulating discussion of the validity of intermolecular potentials determined by fitting the results of classical, rather than quantum, simulations to experimental data.

Professor David Case (The Scripps Research Institute) beautifully brought up to date the "Karplus Rules" for the conformational dependence of proton-proton couplings in NMR.



From left to right: Professors Paul Hopkins, David Case, Russell Hemley, Martin Karplus, Peter Rossky, and Oleg Prezhdo

Professor Martin Karplus (Harvard University and Université Louie Pasteur) gave a wonderful overview of the philosophy and results of his 35 years of simulational exploration of "how proteins really work."

Following the symposium was a public reception and then a banquet, attended by members of the local ACS sections, Professor Karplus and his wife Marci, several members of the Karplus family from California, the symposium speakers, and many guests. Professor Karplus was genuinely moved by the presentation of the Pauling Award Medal and the shared reminiscences of the "old days" with Professor Pauling at Cal Tech.

Professor Paul Hopkins, the Awards Committee, the ACS Sections, and local organizer, Shanon Radford, are to be congratulated for hosting a fitting celebration of Linus Pauling, Martin Karplus, and our continually surprising science of chemistry.

Above Left: Professor Bill Reinhardt relates the story of Professor Karplus's general exam at CalTech; Above Center: Professor Karplus's nephew, Andrew Karplus, reads letters from the Pauling archive at the University of Oregon; Above Right: Professor Martin Karplus shares remembrances of Linus Pauling.

Chemistry Professor Receives 2003 PECASE Award

Assistant Professor Daniel Gamelin received the prestigious Presidential Early Career Award for Scientists and Engineers (PECASE) in a ceremony held at the White House in September, 2004. The award, first presented in 1996, is considered the nation's highest honor for professionals at the beginning of their independent research careers.

Eight federal departments and agencies annually nominate early-career scientists and engineers whose work shows the greatest promise to benefit the nominating agency's mission. Participating agencies award these beginning scientists and engineers up to five years of funding to further their research in support of critical government missions. Professor Gamelin was one of only twenty scientists or engineers (and the only chemist) from the National Science Foundation to receive a PECASE award in 2003.

Assistant Professor Daniel Gamelin

"It's just a tremendous honor to have our group's work recognized in this way," says Gamelin.

Professor Gamelin, who joined the Department of Chemistry faculty in 2000, focuses on developing new inorganic semiconductor materials. His research group is developing new routes for preparing a variety of magnetic semiconductor nanocrystals and thin films that might be used in emerging spin-based electronics technologies, or "spintronics."

Areas of emphasis include understanding the chemistry of how nanocrystals grow when magnetic impurities are present, using spectroscopic and magnetic probes of materials' electronic structure, and developing chemical methods to control the magnetic properties of these materials to make them useful for device applications. The processes used by Professor Gamelin's group continue to reveal new possibilities for nanotechnology involving magnetic semiconductors.

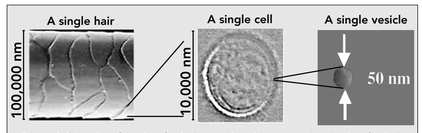
Keck Award, Cont'd from Page 1

Professor Chiu is the first UW researcher, and one of the very few chemists, ever to receive a Distinguished Young Scholar award from the Keck Foundation. The five-year award will support his work trying to decipher how the function of nerve synapses mimics that of a computer in the processes of learning and memory.

The work could lead to greater understanding of, and thus possibly a treatment for, neurological disorders such as Parkinson's and Alzheimer's diseases.

"The synapse, based on our current understanding, is where learning and memory happens," says Chiu.

The Chiu research group uses lasers to remove synaptic vesicles from neurons, the working cells of nerves, and analyzes how they function in synaptic transmission, learning, and memory. Vesicles—essential in the chemical transfer of tiny information packets from one neuron to another—are just 50 nanometers across, about one-two-thousandth the width of a human hair.



Schematic illustration of the size of a single synaptic vesicle compared to the size of a single mammalian cell and the width of a single hair. The vesicle is 1/200 the diameter of a cell or 1/8,000,000 (one eight millionth) the volume of cell. The cell is 1/10 the diameter of the hair.

The research primarily focuses on rat brains and cultures of brain cells. Professor Chiu describes the work as basic research, looking at the individual makeup of vesicles one at a time, trying to learn more about what chemicals are released during various nerve functions and how it changes over time and with activity.

"Once we understand the molecular details, then that will shed a lot of light on various neurological functions and dysfunctions," he says.

Beyond doing cellular nanosurgery at such small scales, the Chiu group actually is doing chemistry at the same level, in amounts of solution as small as one femtoliter (one quadrillionth of a liter).

"We try to do chemistry at such a small scale because unless we can do that, we won't be able to do what we want to do with the synaptic vesicles," Chiu says. "That's a very tiny amount of volume. That makes it challenging."

Department Donors

Donations fund vital Departmental activities such as fellowships, recruiting, and research symposia.

The following individuals, corporations, and foundations donated to the Department of Chemistry between January 1, 2003 and May 31, 2004. Chairman 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 send email to 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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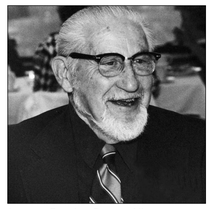
In Memory of Bernard Nist, 1919-2004

Professor Paul B. Hopkins

UW alum and Lecturer Emeritus Bernard Nist ("Barney") passed away on July 4, 2004. He was 85 years old. Barney had suffered several physical setbacks in recent years.

Barney was the youngest and last surviving child in what was by most any standard a very large family. (I believe he told me 19 children!) In his youth, Barney was chopping wood one day, and caught a wood sliver in one eye. The resulting infection cost Barney sight in that eye, which was replaced with a glass ball. He delighted in asking each of us whether we would like to see him remove this eye, an experience most of us declined. But it was always fun to ask Barney which of his two rather independent eyes to position one's self in front of during a conversation. He loved to laugh.

Barney came to UW in 1939 as an undergraduate and "stayed on" as a lecturer in the Department of Chemistry, a position he held from 1950 until 1981. He installed and maintained our first NMR spectrometer. He was a great teacher and no doubt beloved by his students. Barney was also an



Lecturer Emeritus Bernard Nist

incredibly generous friend of this Department. In 1993, soon after the death of his wife Claudine, Barney established an endowed fund to support research, which we have used almost exclusively to support our graduate students.

Barney visited me regularly, though less so as his health declined. I would always ask him how he was, and he always replied, with a look of satisfaction, "Well, I woke up again this morning!" The many of us who knew and loved Barney will miss him.

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Send in your updates!

If you or someone you know was a student or post-doctoral fellow in the UW Department of Chemistry, we want to hear from you. Send the name, year(s) attended, and a brief description of current activities to:

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Chair's Message, cont'd from page 1

programs. We have thousands of square feet of laboratories in the midst of transformative renovations. We are for the eleventh consecutive year interviewing faculty candidates. Graduate student recruiting season is moving into full swing: we must identify and recruit 50 top chemists to join us in our teaching and research mission for the coming fall. Two new courses for undergraduates, emphasizing the emerging areas of biotechnology and materials chemistry, will be offered this academic year. And we must begin thinking harder about how to prepare our graduates for an increasingly global workforce. Much remains to be done.

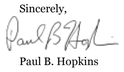
Regrettably, I must add a dose of reality. Federal largesse for research, strong student interest in our field, and spectacular faculty accomplishments are not alone a formula for success: public institutions of higher education typically draw state support that fuels the instructional programs, paying teaching assistants, faculty, and staff wages that must compete nationally. In recent years, our state's higher ed budget has been in near free-fall, and the consequences are now emerging.

Faculty phones are ringing with offers from other schools. I recently watched helplessly as the boxed journals of one of my colleagues were carted off to the moving van. Losses to departures of this kind and retirements will strip us of 20% of our faculty over the next two years. This is Washington's loss. We will look to a new Governor (unknown as I write) and our new President to provide leadership to reverse our current course.

Let me close by thanking all of you for your generosity to the Department. An extraordinary number of friends have contributed to keep our ship afloat during what we hope is a time of transitional financial shortfall. The endowment that supports this Department is growing near the $10,000,000 mark we chose as our target several years ago.

Thank you, and best wishes in 2005.

Sincerely,



Paul B. Hopkins

Department Welcomes Innovative Physical Chemist to Faculty Ranks

The Department is pleased to introduce Professor David Ginger, who joined the faculty in September 2003. Professor Ginger is a talented young scientist working in the emerging field of nanostructured materials and photonics. His publication record already includes over thirty papers in prestigious journals, and his work on nanolithographic techniques for constructing nanoparticle assemblies appeared in the June 7, 2002, issue of *Science*.

Professor Ginger received bachelor's degrees in chemistry and physics from Indiana University. He received both a Marshall scholarship and an NSF Fellowship, which allowed him to pursue his doctoral work at the University of Cambridge with Dr. Neil Greenham. His thesis work focused on the physics of charge transport in semiconducting nanocrystals and conducting polymers. At the Cavendish labs, his leading-edge research on nanocrystalline materials clarified significant issues involving charge transport and charge separation in these systems.

Assistant Professor David Ginger

After earning his Ph.D., Professor Ginger received NIH and DuPont post-doctoral fellowships and worked at Northwestern University with Professor Chad Mirkin. At Northwestern, Professor Ginger contributed to the development of Dip-Pen Nanolithography (a nanopatterning technology) and its use in creating a variety of nanostructured two-dimensional materials. Of his numerous research accomplishments as a post-doc, most impressive was the creation of nanostructured DNA arrays on length scales ranging from 50-nm to microns. This development opened up exciting new areas in biological and materials chemistry.

With his extensive and diverse background, Professor Ginger is initiating his career at the University of Washington by employing Dip-Pen techniques in the areas of materials chemistry and photonics. He has already received independent funding from the National Science Foundation and the Air Force Office for Scientific Research, and he has begun mentoring graduate students. Welcome, Professor Ginger!

Physical Chemistry of Nanostructured Materials

Assistant Professor David Ginger

Much of the excitement surrounding nanoscience and nanotechnology derives from the fact that by using size as an adjustable parameter chemists have achieved new ways to tailor the properties of materials. For instance, the fluorescence from semiconductor "quantum dots" can be tuned from blue to red simply by changing the diameter of the synthesized particles from 2-5 nanometers. Similar materials are now used to build technologically important devices ranging from solar cells to light-emitting diodes to chemical and biological sensors.

In my lab, we are interested in how the size, shape, and organization of materials on the nanoscale impact their optoelectronic properties—in other words, how small scale structures modify the way charges interact with light and vice versa. To investigate these questions, we combine atomic force microscopy (AFM) (which builds high-resolution images of structures by raster scanning an atomically sharp stylus across a surface) with optical spectroscopy (which provides us with chemical information).

For instance, one of my students is combining single-molecule optical spectroscopy with electrically-sensitive AFM techniques so that she can correlate charge fluctuations in single quantum dots and conjugated polymer molecules with observed changes in their optical spectra. Another student, interested in thin-film photovoltaics, is working on a project with implications for solar cell design.

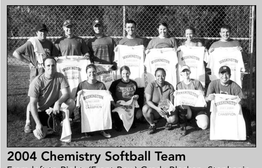
In this area, we have already developed a method to generate semiconducting polymer structures of controlled size by using our AFM to write chemical information on a surface, and we are now studying how the size of these structures affects current generation when they are exposed to light.

Doctor of Philosophy

Spring 2003-Spring 2004

Henry Michael Ajo, E*nergetics of hydrocarbon adsorption on model catalysts;* Professor Charles Campbell; Summer 2003
Danelle Rae Beaudoin, *T-cell signaling in response to altered myelin basic protein peptides;* Professor Craig Beeson; Spring 2003
Craig Gerald Brooksby, *Nonadiabatic molecular dynamics with application to condensed phase chemical systems;* Professor Oleg Prezhdo; Spring 2003
Andrea D. Carroll, *Development of bead injection methodology for immunoassays;* Professor Jaromir Ruzicka; Spring 2003
Daniel Michael Casmier, *Systematic study of Thiazole incorporated gradient NLO bridge chromophores;* Professor Larry Dalton; Summer 2004
Colin Duffy Costin, *Development of a universal microfluidic detector for applications in separation science and process monitoring;* Professor Robert Synovec; Autumn 2003
Thomas Eugene Edwards, *Election paramagnetic resonance spectroscopy of spin-labeled RNA: An emerging tool for the elucidation of RNA structure and dynamics;* Professor Snorri Sigudsson; Summer 2003
Leonard Sheldon Fifield, *Funetional materials based on carbon nanotubes: Carbon nanotubes actuators and noncovalent carbon nanotube modification;* Professor Larry Dalton; Autumn 2003
Mazen Lee Hamad, *Exploring and developing the instrumental aspects of grating light reflection spectroscopy;* Professor Lloyd Burgess; Autumn 2003
Maki Hirao, *A chemical genetic approach for the identification of selective inhibitors of NAD(+)-dependent deacetylases;* Professor Julian Simon; Autumn 2003
Yijun Li, *Detection of enzyme deficent genetic diseases by electrospray ionization mass spectrometry;* Professor Michael Gelb; Spring 2004
Jennifer L. Look, *Mechanistic studies of reactions between molecular oxygen and platinum alkyl and platinum hydrocarbyl hydride complexes;* Professor Karen Goldberg; Winter 2004
Joshua Kelly McBee, *Studies of the isomerization of retinoids in the vertebrate retina;* Professor Krzysztof Palczewski; Spring 2004
David A. Michaels, *An automated comprehensive ultrasensitive two-dimensional capillary electrophoresis system for proteomic analysis;* Professor Norman Dovichi; Spring 2004
Jennifer Lynn Nehring, *Developing models for the active sites of hydrogenase enzymes;* Professor Michael Heinekey; Spring 2003
Lein Thuy Ngo, *Sintering and reactivity of model oxide-supported catalysts: Pt/ZnO(000-1)-O and Pd/a-A2O3(0001);* Professor Charles Campbell; Spring 2004
Yuko Ogata, *Automated affinity measurement of biospecific intersections using a lab-on-valve apparatus coupled to electrospray ionization mass spectrometry;* Professor Frantisek Turecek; Winter 2004
Jason C. Pickens, *Integrating structure-based drug design and multivalency for creating effective antagonists of cholera and E. Colli heat-labile enterotoxin;* Professor Wilhelmus Hol; Autumn 2003
Heather Umbehocker Price, *Photochemical processing of long range transported Eurasian pollution in the northeast Pacific troposphere;* Professor Daniel Jaffe; Winter 2004
Pavle Radovanovic, *Synthesis, spectroscopy and magnetism of dilluted magnetic semiconductor nanocrystals;* Professor Daniel Gamelin; Winter 2004
Dana A. Schwartz, *Diluted magnetic semiconductors: From nanocrystals to room-temprature ferromagnetism;* Professor Daniel Gamelin; Winter 2004
Jennifer Lynn Seymour, *Mass spectrometric and computational methods for the analysis of Cu(11)-2,2'-bipyridine amino acid complexes;* Professor Frantisek Turecek; Spring 2004
Nicole Anne Smythe, *Reactivity studies of platinum(IV) hydroxide and methoxide complexes and the study of pincer palladium (II) complexes as potiental catalysts for olefin epoxidation*; Professor Karen Goldberg; Summer 2004
Bethany Ann Staggemeir, *Dynamic surface tension detection: Nove lapplication to continuous flow analysis and interfacial analysis;* Professor Robert Synovec; Summer 2004
William Michael Stier, *Non-adiabatic molecular dynamics of electronn transfer in dye sensitized semiconductor systems;* Professor Oleg Prezhdo; Spring 2003
Michael Jan Trnka, *Photoaffinity labeling of cytochrome P450s with imidazole-tethered benzophenone compounds;* Professor William Trager; Spring 2004
Le Zhang, *Advances in capillary electrophoresis analysis of lipids, protiens and peptides with laser-induced fluorescence;* Professor Norman Dovichi; Spring 2003

"Ball Slappers" Dominate Softball Championship



2004 Chemistry Softball Team
From left to Right: (Front Row) Grady Blacken, Stephanie Endsley, Farrah Batchelor, Carla McDowell, Mebbie Beattie, Fletcher Kimura; (Back Row) Jim Bollinger, Ryan Bonn, Andrew Akelaitis, Adam McBrady, Lisa Eidenschink, Angela Gifford, Chris Tonzola.

Last spring, the Department of Chemistry co-ed softball team, "The Big Red Ball Slappers," joined the IMA league amid good-natured skepticism about the athletic ability of a group of chemists. It was touch-and-go in the regular season. With the Department's honor on the line, the team just squeaked its way into the playoffs on a 3-2 record.

But the Ball Slappers rallied early on, dominating the playoffs until the third round, when a near loss (due to some unfavorable calls by the umpire) slowed the team's momentum. A hard-fought semi-finals game was won thanks to some excellent hitting, and the team powered its way to the finals.

The final game was a chance for the Ball Slappers to redeem themselves against a team of third-year dental students who had delivered a narrow regular-season loss. A close game marked by numerous lead changes ended in triumph with an outstanding diving catch by Ryan Bonn, a 4th-year student in Norm Dovichi's lab.

Team manager Andrew Akelaitis thanks all his teammates for a great season and a stunning victory!

Mentors Prepare Graduate Students for Industry and Business

Elizabeth Mader

Traditionally, graduate students receive plenty of instruction on how to conduct academic research. With the majority of Ph.D.'s taking non-academic positions, however, students also need guidance for career options outside of academia.

In response to this need, a group of dedicated students, with the help of the UW Center for Workforce Development and the support of the Department, implemented a mentoring program in September 2003 to pair students with professionals in the local industrial and business communities.

Upon application, students describe their career aspirations and areas of interest. They are then matched with a scientist who is further along a similar career path. "It's been an amazing experience and beneficial for both of us," says third year organic chemistry student Julie Bowman, whose mentor is a researcher from Seattle Genetics, a local biotech company. "In addition to exciting discussions about our science, I have learned a lot about the industrial atmosphere, and each of us has made new contacts within the community."

Besides one-on-one time with their mentors, students are invited to participate in a series of seminars, including sessions on negotiating contracts, improving publications and presentations, and snagging that first industrial position.

The first phase of the program—matching students and mentors—was a resounding success in the pilot year, with 16 of 17 students successfully matched. Word-of-mouth is generating more interest in the program, and student participation is expected to increase dramatically in the second year. The biggest challenge now is ensuring that there are enough mentors available.

If you are interested in becoming a mentor, please contact the UW Center for Workforce Development at 206/543-4810 or visit the website at http://www.engr.washington.edu/cwd/chemistry/chemistry.htm.

Grad Club News

Dawn Cohen

After an outstanding 2-year term served by Jason Benedict, I have been elected as the new president of the Chemistry Graduate Student Club. Thank you, Jason, for your exceptional contributions to graduate student life.

This year the club will take a ski trip to one of our beautiful local mountains, and we will bring back last year's popular bowling night at the HUB. Club social events have become so popular that we exceeded the fire hazard limits of our usual meeting place and have moved to a bigger room.

Things are going just as well for the grad club committees.

The Chemistry Graduate Recruitment Committee organizes activities to show prospective graduate students that this department is a fun place to pursue a top-tier education.

The Catalyst Committee, which advocates for under-represented chemists in society, holds monthly meetings and brings industrial and academic speakers to discuss their workplace experiences.

Good cheer and community involvement are essential to our strength. The members of the Chemistry Graduate Student Club look forward to providing opportunities for both for many years to come.

Norman Wayne Gregory and Lillian Virginia Gregory (1920-2003)

Ryan Luce and Elizabeth Riley

Norman and Lillian Gregory will long be remembered for their significant and sustained contribution to the Department of Chemistry at the University of Washington. Their sixty-year partnership ended in 2003 when they died within one month of each other—Professor Gregory on May 25 at the age of 82 and Mrs. Gregory on June 25 at the age of 83.

Norm, as he was known to friends and family, grew up in the small town of Albany, Oregon, 70 miles south of Portland. He earned an associate's degree from the local junior college then transferred to UW, where he completed both his bachelor's and master's degrees in Chemistry.

Lillian Virginia Larson grew up in Seattle, graduated from Ballard High School, and headed off to UW in the fall of 1939. With WWII looming, she left UW to work at Boeing before completing her degree. Lillian and Norm met at a UW mixer.

1943 was a big year for Norm. He married Lillian in May and earned his Ph.D. from The Ohio State University in December. The newlyweds moved to Berkeley, California, in early 1944 after Norm was offered a position as a Research Chemist on the Manhattan Project. Little is known about Norm's work life or scientific contributions to the Manhattan Project; however, Norm and Lillian had their first child, Norm Jr., during their first year in Berkeley.

In 1946, the family returned to the Pacific Northwest, and Norm joined the UW Department of Chemistry faculty. Daughter Martha was born that same year.

Norm started at the Department of Chemistry as an instructor, but quickly worked his way onto the tenure track, achieving a full professorship in 1957. As an educator he earned the nickname "Nails" Gregory by his students, though no one ever doubted his fairness or his unfailing dedication to education. After making it through one of his classes, students recognized the valuable tools "Nails" had given them for their futures.

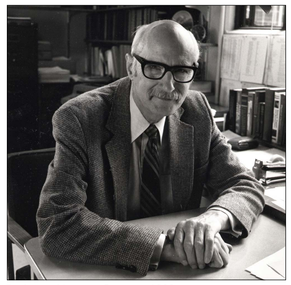
Norman and Lillian Gregory, 1943

Norm made his seminal contribution to chemistry pedagogy in 1964 when he and fellow UW professors David Eggers, George Halsey, and B.S. Rabinovitch published an undergraduate textbook entitled *Physical Chemistry*. Before 1964, most physical chemistry texts first described the macroscopic aspects of chemical systems, including thermodynamics and transport, then covered the microscopic description of chemical systems embodied by quantum mechanics. Statistical mechanics, which provides the bridge between microscopic and macroscopic aspects of chemical systems, was covered last.

Norm felt that the underlying mechanics of chemical systems should be described first, followed by statistical mechanics, with thermodynamics and transport covered last. This approach effectively reversed the common teaching paradigm.

The book was hailed a success after it sold to one hundred institutions in its first printing. It is still considered a groundbreaking work in teaching physical chemistry.

Norm's early research focused on examining a variety of iron and chromium halides, crystal structures, thermodynamic characteristics, heats of solution, heats of formation, and other physical properties of metal halides. He sought to determine the specific values of many other physical chemistry constants as well: vapor pressure, condensation coefficient, heat of sublimation, heat capacity, and free energy of formation. Between 1948 and 1968, he was an author on more than sixty peer-reviewed papers, most of which investigated metal halides.



Professor Norman Gregory, 1983

Norm's unassuming demeanor and reputation for fairness helped to earn him an appointment as Department Chair from 1970-1975. His old friend, Professor Rabinovitch, likens him to Sean Thornton, the character played by John Wayne in the 1952 movie "The Quiet Man." Norm led by example, and by so doing helped the Department to attract world-class faculty members, increase research funding, and educate students--in short, a successful run as Chair.

Throughout his Chairmanship, Norm maintained an active research program, with more effort placed on advanced spectrophotometric methodology to examine in detail the molecules he studied during his early research. He remained focused on metal halides, this time publishing a series of spectrophotometric studies of their vapor phases. He made an imprint on this area with his research on chlorides, bromides, copper iodides, aluminum, iron, antimony, and vanadium.

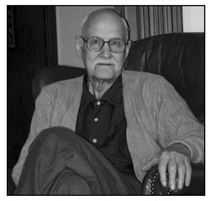
He published his last paper in 1996, nearly half a century after his first article appeared in the *Journal of the American Chemical Society* in 1947.

Norm mentored many students through their graduate studies, and he was active in several chemical organizations and committees. He chaired the Puget Sound Section of the American Chemical Society; served as referee for the *Journal of Chemical Education*, the *Journal of Physical Chemistry*, and the *Journal of Inorganic Chemistry*; sat on the National Science Foundation's grant review board; and remained active in Sigma Xi.

Despite Norm's commitment to work, he and Lillian made building a tight-knit family a priority. Their third child, Brian, was born in 1963. Most nights the entire family sat down together for dinner.

With the shelp of their children, the couple built two cabins for Gregory family vacations, where they enjoyed playing cards and making music (Norm played piano, organ, and clarinet). The cabins were also places where Norm could pursue his interests in gardening and glass blowing while Lillian used her free time to enjoy word puzzles, Lawrence Welk, and the Jackie Gleason show.

Their sons, Norman Jr. and Brian, have been active radio broadcasters in the Puget Sound area for many years. Norm was part of the legendary lineup of DJs that dominated the Seattle radio scene at KJR in the 1970s, and Brian is the business reporter for KOMO.



Professor Norman Gregory, 2003

Norm found humor in the extraordinarily different career paths his sons had taken in light of his own career, willing to admit that he didn't completely understand their professions. His sons, in turn, felt Norm's profession was so complicated it must be a different language.

It was Martha who inherited her father's analytical talents and his love of teaching. She is a high school math teacher. Her daugher, Norm and Lillian's granddaughter, hopes to pursue a career in academics as a professor of biology.

As Norm and Lillian aged, they focused on the things they enjoyed the most–eating at restaurants, playing cards, and spending time with each other. Fifteen years before his death, Norm was diagnosed with prostate cancer. Although he was occasionally treated for it, his colleagues say you would not have known. He and Lillian sustained a vital connection to the Department and the Puget Sound region, and Norm worked until his death last year.

Norm and Lillian Gregory are missed, but their passionate dedication, both to their family and to the Department of Chemistry, will not be forgotten.

As an enduring reminder of their parents' legacy, Norm Jr., Martha, and Brian established the "Norman J. and Lillian V. Gregory Endowed Fund in Chemistry." This fund will provide support for Department activities at the discretion of the chair.

If you wish to contribute to the Norman J. and Lillian V. Gregory Endowed Fund in Chemistry, please send your check or money order made payable to "Gregory Fund—Department of Chemistry" to: University of Washington, Department of Chemistry, Box 351700, Seattle, WA 98195-1700.

Engaging the Mind, Heart, and Soul in Chemistry

Mary Harty

As part of UW's mission to advance new knowledge through public service, the Department of Chemistry offers community outreach opportunities through Science Service Learning courses. These courses provide students with the opportunity to volunteer at local schools and homeless shelters as they lead K-12 students through a variety of science activities. The courses are also designed to encourage students to reflect on the role of scientists in society and to examine issues related to science literacy, science education, objectivity, ethics, and politics.

"Science by Kayak" is one of these service courses. Funded by Seattle-based biotherapeutics leader, Zymogenetics (thanks Zymo!), the course teams university students with sixth graders to explore the biology and chemistry of aquatic ecosystems within the context of Native American culture. The curriculum includes performing water quality analysis, extracting plant dyes, identifying native plants and understanding their use by Native Americans, and kayaking (of course).

During the first three sessions, UW students work with Mary Harty, the UW Department of Chemistry adviser who designed the "Science by Kayak" curriculum. These early sessions focus on learning how to use the curriculum and interact with the children. UW students then spend three sessions introducing topics to sixth graders at their middle school.

In the first experiment, the sixth graders learn about water quality analysis by testing the pH of various household products using colorful indictors. They are also taught about the effects of pH on organisms living in aquatic ecosystems.

The next experiment demonstrates the importance of dissolved oxygen in water. Students perform a series of chemical steps and use the technique of titration.

The last experiment explores various ways Native Americans have utilized plants for medicines, foods, and materials. For example, students learn that the precursor for aspirin, salicylic acid, can be extracted from willow bark. They learn that the needle tips of both Douglas-fir and hemlock may be steeped in hot water to make a refreshing tea that is high in Vitamin C. They learn that red cedar is used for making canoes, houses, clothing, and art and is still revered by all northwest coast Native people for its healing and spiritual powers. Students are then shown how to extract natural dyes from plants such as Oregon grape, blueberries, red alder, and hemlock. They are also shown how adding metal ions or varying the pH affects the color of dye.

The culminating event is an all-day kayaking fieldtrip to Washington Park Arboretum, where students apply their newfound knowledge to identify native plants and birds and to determine the water quality of Lake Washington. The trip always generates lots of enthusiasm for learning science!

Science by Kayak is just one of our many outreach projects that transforms undergraduate students into scientists engaged in and contributing to their community. Evaluations show that the Science Service Leaning courses develop students' communication skills, help them to clarify their career goals, and build their confidence as scientists. These courses also allow students to deepen their understanding of science, giving them a sense of ownership of science as a profession.

In addition, national studies indicate that service learning improves academic achievement across disciplines, enhances students' beliefs in their personal efficacy, and can be an important part of civic education, influencing political action skills, communication skills, and critical thinking skills.

Students themselves explain the benefits of service learning more poetically: "Service learning is interesting and motivational because it engages the mind, the heart, and the soul."

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