FULMER NOTATIONS

Department of Chemistry
Department of Biochemistry and Biophysics

INSIDE THIS ISSUE . . .

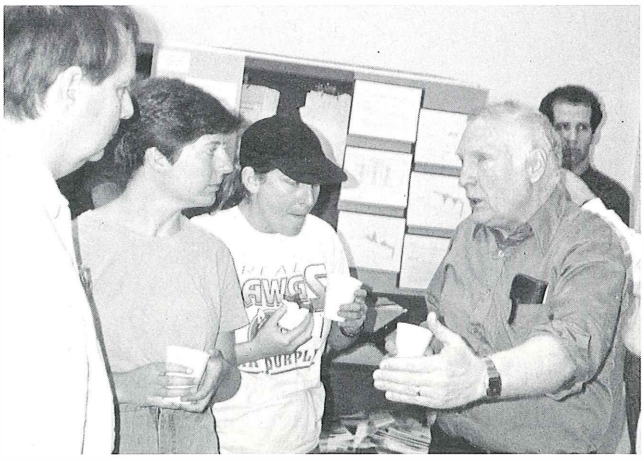
FALL 1993

Crosby Teaching Teachers Chemistry

During the summer of 1992, the first high school science teachers to enroll in WSU's innovative M.A. in chemistry program arrived on campus. This past summer that initial group returned for their final year on campus and a new group of teachers arrived to begin their coursework. A team led by professor G.A. Crosby developed this program to attack the problem of public school teachers teaching outside their fields. For example, teachers with degrees in biology often teach chemistry, physics, and even math and computer science.

The program can be completed in three years through a combination of summer courses on campus, a two-month summer assignment at a federal laboratory, and VCR instructional tapes

(Teaching Teachers continued on page 11)



Crosby and M.A. students at the end-of-summer party.

WASHINGTON STATE UNIVERSITY

Remembering Professor Wagner

In 1978, the WSU Department of Chemistry established the E. L. Wagner Graduate Fellowship to honor the life and work of professor Edward Wagner. Wagner was a member of the department for 26 years, from 1949 until his death in 1975. His work in experimental molecular structure and his theoretical calculations on small molecules earned him international recognition. Expanding these interests in later years he used computers extensively to carry out rigorous calculations on small molecules of second row elements. At the time of his death, he was working on HNO, FNO, H_3NO, and F_3NO.

Throughout his life, professor Wagner championed high academic standards and was committed to graduate education and research. Thus, the fellowship named in his honor is a prestigious award recognizing a chemistry graduate student of unquestioned scholastic merit who also shows great promise in research. Both entering and continuing students are eligible, although students in mathematically oriented (for example, physical chemistry) specialties are preferred.

The 1992 recipient of the E. L. Wagner award was Jennifer Kahl. She is an organic student in who came to WSU in 1987 from the University of Nebraska. Working in professor Rob Ronald's lab, Kahl is in the last phases of her experimental work and is in the process of pulling together her thesis.

The Wagner scholarship is not the only legacy of professor Wagner. The chemistry department is honored to be the home of his book collection. It is available to all faculty and students.

If you have a special memory of professor Wagner, or you would like to make a donation in his honor, please use the attached postage-paid envelope to send it to the chemistry department. Thank you!❖

A Word from Willett

Research activities continue to prosper in the department. Our current external support is in the neighborhood of $2,000,000 a year. This is up 100% from two years ago. Ken Mopper (see article on facing page) and James Satterlee have been particularly successful, but many others make strong contributions as well.

We've experienced a number of personnel changes lately. We are please to welcome James Hurst to our faculty from the Oregon Graduate Institute where he established a successful research program examining the role of the hypochlorite ion in blood chemistry. He brings with him the nucleus of his graduate program, including a senior post-doctoral associate.

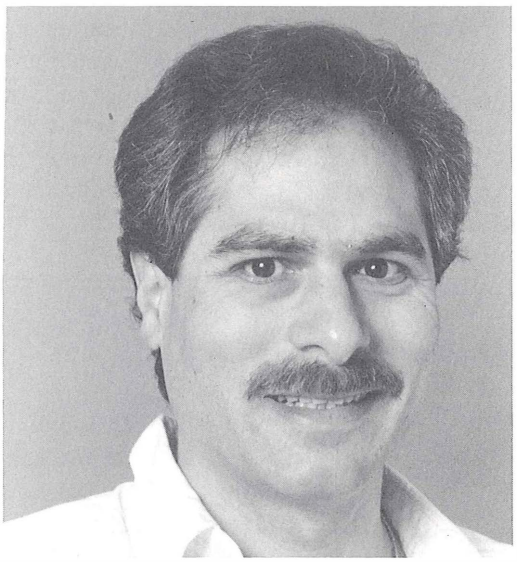
David Cleary has left WSU, accepting a physical chemistry faculty position at Gonzaga University. We are initiating a search to add a new physical/materials chemist to our faculty. We are also entering the interview stage in our search for a new theoretical chemist at the WSU Tri-Cities campus. This will be our first permanent faculty member at that site.

Professor Ursula Mazur has been named Chair of the Materials Science Program. Congratulations Ursula.

Staff changes have occurred as well. Ruben Lira who was responsible for graduate student recruiting and student affairs has moved on to another department on campus. Gene Watson (see article on page five) has retired after 34 years as a departmental storeroom clerk.

As a department and as a university, we are adapting to the new realities of the state and national fiscal and funding policies. We are rethinking and reestablishing our priorities, but always keeping quality uppermost in our activities.❖

Faculty Spotlight



Professor Ken Mopper

Why is an oceanographer living in Pullman, 300 miles from the coast?

As a professor of chemistry, Ken Mopper's research focuses on trace analysis of dissolved organic compounds in natural waters. He studies the chemical and photochemical reactions and cycling of these organic compounds. This research leads him to Hawaii, the Caribbean Sea, the Black Sea, and Antarctica.

At this point he has three major areas of research:

- The impact of ultra-violet (UV) light on the chemistry of surface ocean water in the Antarctic.
- The mechanisms and chemical pathways involved in the changes on the surface ocean water caused by UV light.
- How organic particles form and flocculate in the ocean.

This fall he will study the impact of UV light on the surface layer of sea water in the Antarctic. UV light hits the surface of the ocean, causing photochemical reactions which create highly reactive free radicals. These reactions have an important influence on the carbon cycling in the ocean. Mopper's research is becoming more important as the hole in the ozone layer increases, letting more UV light into the earth's lower atmosphere.

Mopper spent five weeks in Antarctica on board the R/V Nathaniel B. Palmer, with biologists, photobiologists and marine chemists who will use buoys with submerged probes set at different depths in the water column to collect data. The probes are equipped to measure light intensity, wavelengths and free radical production. The scientists will be able to immediately analyze the samples as the ship is outfitted with liquid chromatography equipment.

Mopper came to WSU in 1990 from the University of Miami Rosenstiel School of Marine and Atmospheric Science. He felt his research would benefit from moving to a department devoted to the specific study of chemistry. Although Pullman is several hundred miles from the ocean, this distance does not impede his research as most of his field studies are performed in remote locations. He also enjoys the quality of life in Pullman and the Northwest.

He currently has five graduate students working in his lab. Mopper was recently awarded a significant grant from the Office of Naval Research (ONR) to support two of his students, Gayle Marsh and Jim Elliston. The grant will provide their full support including tuition, supplies and travel. The grant is in coordination with Mopper's grant from ONR studying the flocculation of algae.❖

War Stories of WSC's Cougar Chemists

This past spring we were fortunate to have two Golden Grads, Otis Fortner (chemistry '41) and Robert Weaver (chemical engineering '42) stop in to visit and share stories about WSC when they were here.

As WSC fans listened to the WSC -vs- Texas A & M football game on Saturday, December 6, 1941, they never imagined the paths their lives would take in the upcoming years. Soon after the Japanese attack on Pearl Harbor, WSC joined the patriotic fervor spreading across the country and diligently prepared to resist a possible Japanese attack on Pullman. For example, radio announcers stopped broadcasting weather forecasts for fear the information could fall into the wrong hands and be used to facilitate a Japanese attack. Specially trained "plane spotters" watched the skies for Japanese airplanes, and the lower floors of brick buildings, including the chemistry building, were designated bomb shelters.

Between 1941 and 1945, WSC experienced drastic changes that forever altered the college. The make-up of the student body changed, many instructors and researchers left WSC to help with the war effort, and classes were modified to meet specific war needs. The number of male students at WSC dropped dramatically while the number of female students rose. Before the war years, the ratio of males to females was five to one; by the fall of 1941, the ratio was two to one. WSC was the site for three major military training programs. In 1942 students in the Second Air Force B-17 gunnery and radio training program lived in Ferry Hall. About 750 people participated in the Army Specialized Training Program in 1943. Also in 1943, the largest College Training Detachment in the nation opened at WSC with 5,000 students.

Safeway prices (9/15/44 -vs- 9/15/93)

Head lettuce	$ 0.14	$ 0.98
Skippy Peanut butter (1lb.)	$ 0.35	$ 2.09
VanCamps Baked Beans	$ 0.14	$ 0.67
Fresh ground beef	$ 0.28/lb.	$ 1.69

The WSC's Department of Chemistry had a virtual "branch campus" in New York City during the war years. On September 29, 1944, the Pullman Herald reported Professor S. E. Hazlett presented a paper at the American Chemical Society meeting in New York. While there he spoke with WSC chemistry professors Schultz, Culbertson, and Gilbertson who had all been called into special duty for the US government. The department contributed greatly to the war effort through the faculty's work on the atomic bomb.

Professor Phillip Schultz resigned his position at WSC to work with Enrico Fermi and Harold Urey at the newly established Institute of Nuclear Studies at the Univer-

Frances Gay Knox, Harold Dodgen and Walter Becker enjoy lunch at the Golden Grads reception.

sity of Chicago.

Professor Julian Culbertson took one year's leave of absence to work at Columbia University to conduct "secret war research". At the time he was called to duty, his responsibilities and the project he would be working on were a secret, even to him.

Henry Linford (Ph.D. chemistry WSC '35) was on the faculty at Columbia during that time. The Pullman Herald speculated he may also have helped on the atomic bomb project.

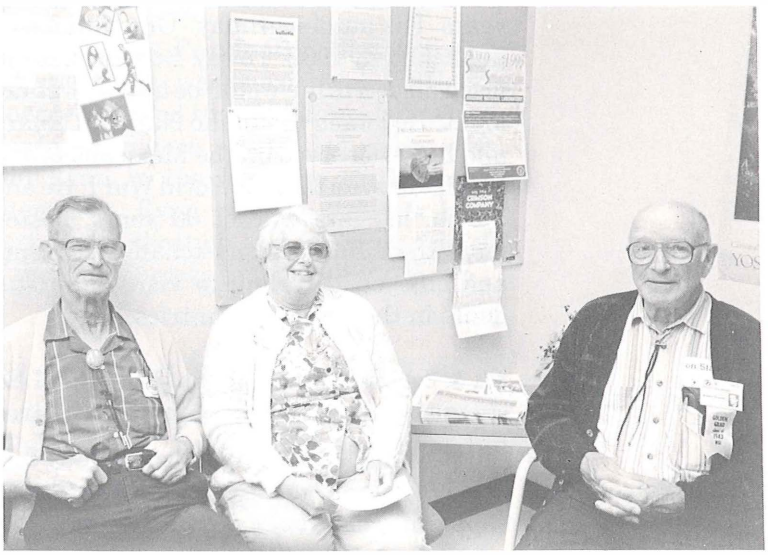
Professor Lyle Gilbertson, who left Pullman in 1942, reported his laboratories were "besieged" with reporters after the news of the atomic bomb was made public.

Professor Gilbertson's departure from WSC made room for recent graduate, Otis Fortner to become an instructor for the department. He earned $1.00 per hour teaching freshman labs, some physics courses, and chemistry to nurses at Deaconess hospital. Mr. Fortner and W. F. Holbrook, WSC associate chemist, worked for the U.S. Bureau of Mines in a pilot plant on campus. The War Production Board assigned a special AA-1 priority classification to the plant. Fortner and Holbrook, among others, tested the carbothermic method of production of magnesium to be used in manufacturing airplane parts and bomb casings. They also developed a process for the separation of magnesia, used in the production of magnesium metal from both magnesite and dolomite ores. Their work helped solve a light metal problem for the United States.

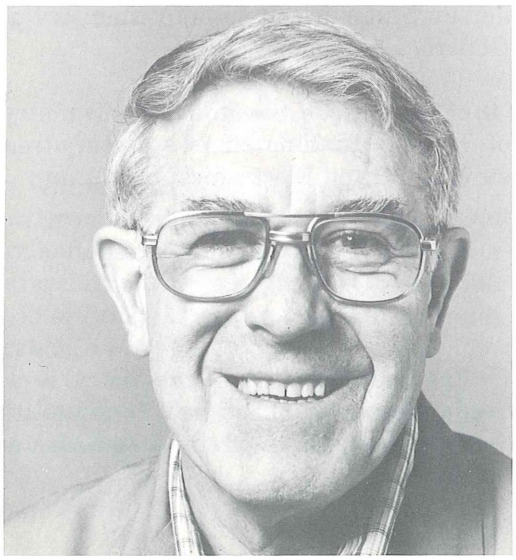
On December 8, 1944, the Pullman Herald reported one of the "oddest coincidences of the war". Robert Weaver was a lieutenant stationed in Iran helping move war supplies across Iran to the Russians. One of his lab assistants in Iran was A. M. Khalipur who earned his master's degree from WSC in 1937.

All in all, in a variety of ways and throughout the world, WSC played an important role in America's fight to win World War II.❖

Many thanks to Mr. & Mrs. Fortner, Mr. Weaver, the Pullman Herald, and Harold E. Helton contributing author for "The Bunchgrass Historian", the publication of the Whitman County Historical Society. They have all proven to be invaluable sources.



Otis and Eula Fortner (left) and Bob Weaver (right)



Watson Retires after 34 Years

This fall Gene Watson retired from WSU after 34 years as one of the chemistry department's storekeepers. He looks forward to reclaiming his neglected yard, and working on some of his hobbies, particularly rock polishing and wood working. Gene got his start at WSC when a friend told him that the storekeeper was retiring and suggested that Gene apply for the job. During Watson's years in the department he has seen many changes, in fact, three of the four chemistry buildings have been built during his time at WSU. Although he is excited about retirement, he will miss all the people he has worked with over the years. Best wishes Gene!❖

Alumni News

We are pleased by the response to Alumni News. Please continue to send us information about what you are doing in the enclosed postage paid envelope. Thank you!

20's

'23 Theodore Budrow (B.S.-chemistry) has retired after working for DuPont for 30 years. His autobiography "One Time" was published in 1992. To say Budrow has enjoyed an active life would be an understatement! He joined the Idaho National Guard and in 1916 served on the Mexican border. He also drove a tank in World War I. He and Melba, his late wife of 60 years, hosted more than 100 foreign exchange students and enjoyed traveling to visit those students in their native countries.

'23 & '24 Walter Huppke (B.S. & M.S.-chemistry) recently passed away. He lived in Land O'Lakes, Florida.

30's

'31 & '33 Art Brunstad (B.S. & M.S.-chemistry) and his wife Helen were presented the Weldon B. Gibson Distinguished Volunteer Award which recognizes "the highest levels of exemplary service and achievement on behalf of WSU". After graduation, he served as a chemical officer in World War II, he worked for the U.S. Bureau of Reclamation, General Electric, and eventually retired from the Atomic Energy Commission in Richland where he was nuclear safety chief.

'33 Philip Abelson (B.S.-chemistry; M.S.-physics at WSU; Ph.D.-physics from University of California-Berkeley) was awarded the 1992 Public Welfare Medal, the highest honor of the National Academy of Science (NAS). Abelson was editor of Science magazine for 22 years and was one of the few scientists to be simultaneously a member of the NAS and the Institute of Medicine.

'37 Dale Antles (B.S.-chemistry) is retired from his position as chief chemist at the Washington State Department of Agriculture. He was recently honored by having a laboratory named for him!

40's

'40 Albert Hunter (B.S.-chemistry) is professor emeritus of soil fertility at Penn State University.

'41 Frederick Bollinger (B.S.-chemistry) has retired after more than 35 years with Merck & Company, Inc. He is the co-inventor of Sinement, Merck's medicine for Parkinson's disease which realizes more than $100 million in sales annually. In addition, he holds 16 U.S. and foreign patents and has published numerous research papers. Since his retirement in 1987, he has studied genealogy, and once a week teaches basic subjects to inmates of a New Jersey State Prison to help them obtain General Equivalency Degrees.

'48 Alice Benson Strand (B.S.-chemistry) of Tieton, Washington is secretary/treasurer of Strand Electronics, Ltd.

50's

'50 Roland Richards (B.S.-chemistry) is retired and presently an active volunteer with the WSU cooperative extension as a Master Gardener.

'52 Lawrence Eng (B.S.-chemistry at WSU; M.S. & Ph.D. at Stanford) is a professor in the Department of Pathology within the School of Medicine at Stanford University.

60's

'64 Douglas West (Ph.D.-chemistry) was named Distinguished Professor at Illinois State University, one of only 22 faculty members to be so honored. Distinguished professorship awards are based on national recognition for scholarly research, teaching ability and public service. He has earned an international reputation for his work in the field of inorganic chemistry and has published more than 160 research articles on the synthesis and characterization of compounds containing metal ions attached to biologically important groups.

'65 William Seese (Ph.D.-chemistry at WSU; B.S. at University of New Mexico in pharmacy and M.S. from University of New Mexico in chemistry) is retired.

'66 Todd Martensen (B.S.-biochemistry) is the program director for the Biochemistry Program in the Division of Molecular Biosciences at the National Science Foundation.

70's

'72 William Perry (B.S.-chemistry at WSU; M.S. from Florida Institute of Technology) is a lieutenant colonel in the U.S. Army. He is the chief of the Atcom Field Office in the U.S. Military Training Mission in Saudi Arabia.

'73 Jeffrey Miller (B.S.-biochemistry) and his wife Kathleen, report the birth of their son, Thomas. They are both members of the neuroscience faculty at Harvard Medical School.

'74 & '75 Christopher Dunagan (B.S.-biochemistry; B.A.-communications) is a health/environmental reporter for The Sun newspaper in Bremerton. He recently received the 1992 Governor's Writing Award for his book, "Hood Canal: Splendor at Risk".

'75 & '83 Greg Pearce (B.S.-biochemistry; M.S.-nutrition) was one of three WSU employees awarded the 1993 President's Employee Excellence Award. He works with Bud Ryan in the Institute of Biological Chemistry. Ryan praised Pearce's hard work and dedication and attributed much of the lab's success to Pearce's work.

80's

'85 Edward Huston (Ph.D.-biochemistry) is a research investigator for Sterling Winthrop Inc. at the Pharmaceutical Research Division in Malvern, Pennsylvania.

'85 Gregory Haynes (M.S.-chemistry) is a graduate student at the University of Maryland in Baltimore. He is conducting infrared studies on molecules related to membranes.❖

Faculty & Student News

The Dean of Sciences Teaching Award was presented to Professor of Chemistry Manning Cooke for his outstanding teaching of organic and general chemistry.

Congratulations to biochemistry professor Jeremy Evans for being granted tenure!

Michael Griswold, chair of the Department of Biochemistry & Biophysics will present the 1994 WSU Distinguished Faculty Address. He was also invited to present the fifth annual A. V. Nalbanov Lecture at the University of Illinois at Urbana-Champaign.

Two professors in our departments were awarded professional leaves this year. Kerry Hipps took leave to develop a technique for measuring spectra of single molecules at selected sites on surfaces. Raymond Reeves will work at the National Institutes of Health Laboratories to study if the A.T-DNA binding, mammalian HMG-I/Y non-histone chromosomal protein is involved in phasing or positioning of nucleosomes in the chromatin of higher eukaryotic cells.

Kip Kendrick, a student of Glenn Crosby's, is the local chapter president of Phi Lambda Upsilon (PLU), the national chemical honor society. Gary Van Berkel of Oak Ridge National Laboratory was the guest speaker at PLU's annual spring awards banquet. During orientation week this fall, PLU hosted a picnic to welcome the new graduate students.

The Department of Materials Science has a new chair: Professor of Chemistry and Materials Science Ursula Mazur.

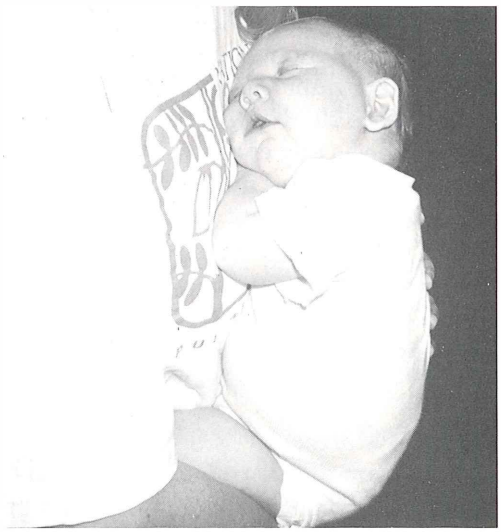
Ursula Mazur and Kerry Hipps have a new scanning tunneling microscope for ultra high vacuum acquired with a Murdock Foundation equipment grant.

Susan Meiergard was awarded a National Research Service Award from the National Institute on Drug Abuse. This is a two year fellowship covering a stipend, travel and research costs.

Ron Poshusta spent the summer working at Battelle Pacific Northwest Laboratories. Daryl Clerc, one of his students joined him and will spend the fall semester calculating the electronic properties of layered intercalated materials.

Linda Randall was recently granted a National Institute of Health MERIT (Method to Extend Research in Time) award. The program was designed to reduce the time researchers spend away from the laboratory writing grant proposals. This award provides up to ten years of support. Randall was also elected to the American Academy of Microbiology.

Ralph Yount was elected the 1994 president of the 4500 member International Biophysical Society.



BABIES:

- Amy Elizabeth Richter (above) was born to Tracy and Mark Richter. Mark has just finished his Ph.D. in chemistry. The family is living in Austin where Mark has a post-doc position at the University of Texas.
- Asopuru Okemgbo and his wife Anthonia celebrated the birth of the daughter Jaachim in February. They have an older daughter named Kaetochi. Asopuru is a graduate student working with professor Herb Hill.
- One of Glenn Crosby's students, Durwin Striplin is also a new father. Durwin's wife Caryn had baby Morriah Elizabeth in April.❖

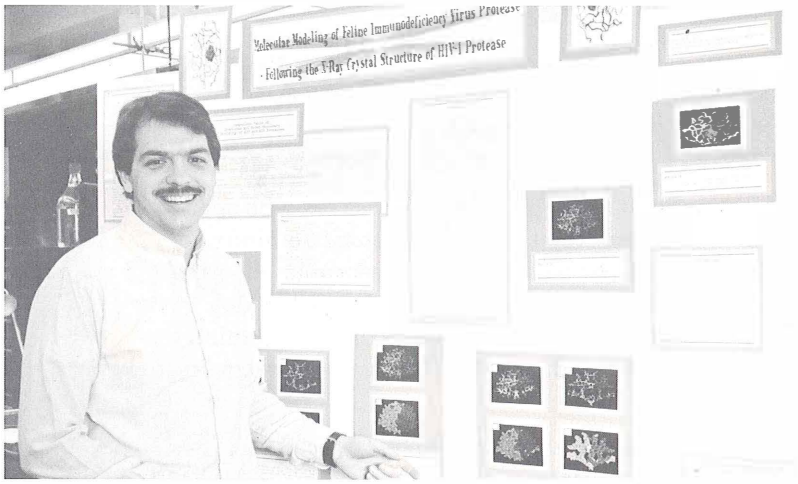
Biochemistry Student Studies Model for HIV

David Hill, biochemistry graduate student, recently had his poster display voted one of the best in his BC/BP 578 class. Hill is pursuing his Ph.D. under Ray Reeves. Hill earned his M.S. degree in chemistry at the University of Montana.

While at Montana he studied the reverse transcriptase enzyme of Feline Immunodeficiency Virus (FIV). FIV is important as a small animal model for Human Immunodeficiency Virus (HIV). An animal model provides a way to test chemotherapeutic strategies and vaccines and helps to understand the pathogenesis of a virus. FIV shares many properties with HIV including morphology, cell trophism and pathogenesis.

Viral proteases are prime targets for chemotherapy. The protease cuts long viral protein sequences into smaller individual proteins that carry out the steps in replication. Complete inhibition of the protease would stop viral replication.

Using computer modeling techniques to compare their structures, Hill demonstrated the similarity of FIV and HIV proteases. He used the structure of HIV protease to create an analogous structure of FIV protease. Computer based analysis and comparison of the amino acid sequences of the two proteins show a 74% structural similarity. The dissimilar regions are remote to the catalytically active site and lay primarily in regions which form loops or turns, thus the active sites of the viruses remain unchanged. This computer modeling demonstrates the FIV protease is sufficiently similar to HIV protease to support research using the FIV as a model for HIV. Furthermore, the structural information could lead to the design of new drugs to inhibit the protease enzyme. ❖



David Hill shows off his winning display

Biochem Student Group Making Changes

This year's group of incoming biochemistry graduate students are luckier than most of their peers throughout WSU. Not only are they joining a great department, but they have an opportunity to join the Biochemistry Graduate Student Association (BGSA).

President Virginia Smith, describes the goals of BGSA as trying to help new students adjust to life in Pullman, and to keep all students informed of upcoming events, deadlines, and graduation requirements. The groups gives students an opportunity to voice their concerns and recommend solutions. As an official organization, they also have representation in the Graduate and Professional Student Association (GPSA), where they are one of the larger student groups.

Once a month the group gathers to hear students from each lab present their results and describe their research. In addition to student presentations, the group also hosts guest speakers. At recent meetings, the speakers represented WSU's Office of Grant and Research Development and Career Services.

Once the applicants are accepted into the graduate program, they receive a letter from BGSA introducing them to life in Pullman. They are given the name of a "sponsor" who helps them with any problems or questions they have. It is not uncommon for a sponsor to help arrange housing for the incoming student.

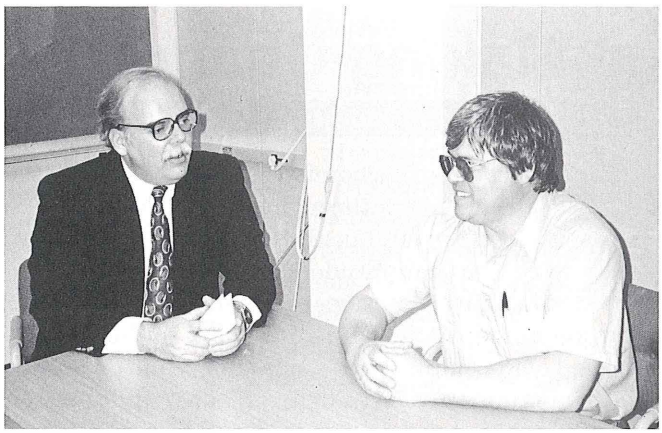
This spring BGSA will to host Paul Hagerman, Ph.D., a renowned DNA researcher from the University of Colorado Health Science Center. He will present the departmental seminar on February 10.

The funds used by BGSA are derived from the Biochemistry Development fund and the group's fund-raising activities. This year they are selling hot, black T-shirts. Show your WSU pride and buy a T-shirt; it will support a worthy cause. Call (509) 335-1276 to order your shirt. ❖

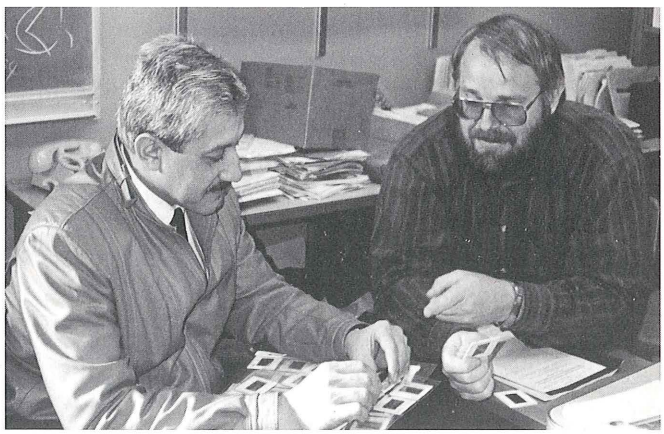
Look Who's Talking!
Spring Seminars

These are just a few of the nine speakers who spoke this past spring for the departmental seminar series. Each speaker spent a day on campus meeting with students and faculty and finished the day by giving a seminar. Your donations to the Chemistry Development Fund support this popular program.

(Right Photo) John Anderson of the Washington State Patrol discusses forensic chemistry with graduate students Greg Long (center) and Daryl Clerc (left).



(Left photo) Steven Japar of The Ford Motor Co. discusses the atmospheric chemistry of alternate transportation fuels with graduate student Bob Thomas.



(Right Photo) Carlos Morales (left), of the Department of Anatomy at McGill University in Montreal, shown here speaking with Steve Sylvester. Morales is a former post-doc of Mike Griswold's. While here, he spoke on lysosomal delivery of a 65 kDa form of sulfated glycoprotein-1/prosaposin and mature saposins to phagosomes of rat sertoli cells.

Bruce Hudson of the University of Oregon speaks with professor Toshiko Ichiye. His seminar was titled, "Watching Molecules Wiggle: Vacuum Ultra-Violet Raman Spectroscopy".

The other speakers we hosted were: Fred Wudl of The University of California at Santa Barbara, Ralph Yount of WSU, M.A. Subramanian of DuPont, Paul Hansma of the University of California at Santa Barbara, Joel Rosenthal of Chevron and Janis Upesclasis of Lederle Labs. Thank you to all those who participated.

Are You Doubling Your Dollars??

The following companies participate in Matching Gift giving. They increase the size (sometimes doubling) your donation without straining your wallet. Other companies also offer matching gift programs, so please check with your employer to see if they match donations. Thank you!

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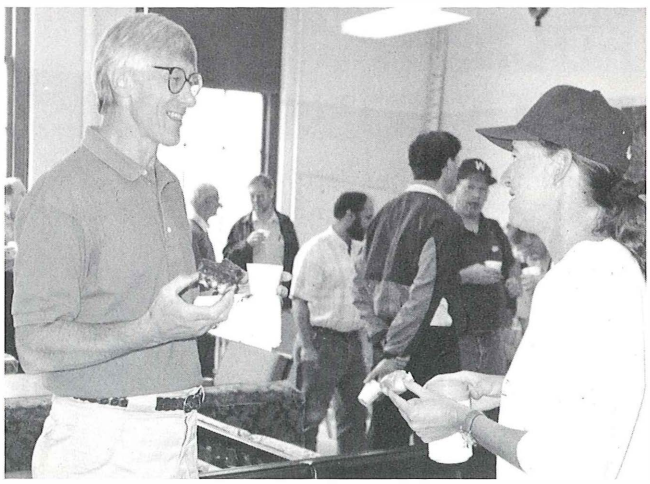
(Teaching Teachers continued from page 1)

the teacher views at home during the academic year. A school district commitment is required for acceptance of the teacher into the program. Up to $2500 (in addition to the usual science budget) will be matched by the program to enhance the science offerings (particularly chemistry) at the teacher's school. In lieu of a thesis the student/teacher is required to formulate a comprehensive plan using what they learned during the program to describe how they will use their funds to improve chemistry teaching in their home environment. Their ideas must be feasible and pass a peer review.

Over the next three years, the program will bring almost one quarter of Washington State's chemistry teachers to WSU. The program is funded by WSU, Penwest, the Murdock Charitable Trust, Battelle Pacific Northwest Laboratory and the National Science Foundation.❖



One of the instructors of the M.A. program, Conrad Stanitski, and a student enjoy the end-of-summer surprise party for Professor Crosby's birthday .

Biochemistry Business

by Michael Griswold, Chair

The Department of Biochemistry and Biophysics has had a very active and productive year. We have been primarily known as a graduate department, but this fall the number of undergraduate majors jumped from around 30 to over 50. We attribute the increase to an expanded interest of entering students in the basic sciences and the continued good job market for students with biochemistry degrees.

Due primarily to the efforts of Bruce McFadden we have attracted a crystallographer from M.I.T. to join the faculty in the fall of 1994. During the next year, Chul Hee Kang will, along with several current faculty members, attempt to secure outside funding for the major equipment items required for an operational X-ray crystallography laboratory. The hiring of Kang strengthens the growing interest of the department in molecular structure.

Gerald Hazelbauer, the director of the very successful NIH training grant in protein biotechnology, organized and submitted an application for renewal of this important program. Recently we were visited by a team of NIH reviewers and from all reports the visit went well. We emphasized to the visitors that our strongest attribute has been the successful contributions of our graduates to many areas of science.

Despite budget cutbacks, the total amount of outside funding obtained by the faculty continues to grow. This is due in part to the continuing productivity of the senior faculty. A recent MERIT award to Linda Randall is an outstanding example. In addition, the more recent additions to the faculty have been very successful in attracting outside support. Toshiko Ichiye, for example, has her productive program in computational structure analysis well funded.

The Biochemistry Graduate Student Association (BGSA) along with other graduate student organizations, were influential in the decision of the Washington State legislature to provide graduate students with better health insurance coverage.

He's going to give Biochemistry T-shirts for Christmas. Why Don't YOU??

(509) 335-1276

FULMER NOTATIONS

Department of Chemistry
Department of Biochemistry and Biophysics
Washington State University
Pullman, WA 99164-4620

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