
Alumni News

A publication for alumni and friends

University of Kansas

Chemistry Department

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Congratulations Paul H. L. Walter (Ph.D., 1960) ACS President 1998!

DOE grants KU Department of Chemistry \$1.1 million in research funds

The U.S. Department of Energy has awarded more than \$1 million in grants to the Chemistry Department for development of long-term programs to explore issues of environmental importance at the basic research level.

The DOE awarded a \$775,000 grant to Kristin Bowman-James, professor and chair of the Department; George S. Wilson, Higuchi distinguished professor; and Krzysztof Kuczera, assistant professor. The grant is for research to develop molecules that selectively recognize negative ions.

A \$350,000 grant was awarded to Daryle H. Busch, Roy A. Roberts distinguished professor and Richard S. Givens, professor and assistant provost, for research in developing new separation methods managing tight-binding receptors for new separations technologies.

"This is an incredible opportunity," said Bowman-James. "The DOE recognizes that there is a need for long term, basic research in areas re-

Notes from the Chair...

Greetings to all of the friends of the Chemistry Department!

It has been a very good year for our Department, with lots of exciting things happening. While I know each of you will read this entire newsletter very carefully, I thought I would mention what I consider to be some of the major highlights of the year.

First of all, congratulations go to our loyal alum Paul H. L. Walter for winning the election for ACS President this year. We are indeed fortunate that Dr. Walter will be the guest speaker at next year's Awards Presentation and Honor's Reception. We wish him a successful presidency.

Of course, we have been most fortunate to have added two junior faculty to our ranks, Andy Borovik, an inorganic/organic (I/O) chemist from KSU, and Paul Hanson, a synthetic organic chemist fresh from a postdoc in Barry Troost's group at Stanford. Both Andy and Paul have made major splashes in the department, and the fifth floor where they both have labs is now noted to be constantly in the excited state.

As you will note in reading through this letter, our young and even not so young faculty have been extremely successful in garnering research funds and awards this year. In fact, I think that this has been one of the most successful years in these areas for quite some time. Special accolades go to Shih-I Chu with his effort in obtaining a new supercomputer (p.3), Krzysztof Kuczera for his *Quest for the Best Award* to implement a new Web-based molecular modeling class (p.4), Barbara Schowen for the Midwest Regional Award in Mentoring Undergraduate Research (p.8) as well as her appointment as director of KU's entire Honors Program (p.13), and Buzz Adams for the Oesper Award for his outstanding chemistry (p.13). Additional special recognition goes to Bob Dunn for his CAREER Award as well as being named a Searle Scholar, Cindy Larive for an Eli Lilly New Faculty Grant as well as being named Kaw Valley Girl Scout Council Woman of Distinction, Paul Hanson for the grant award from the ACS Herman Frasch Foundation supporting work in agricultural chemistry, and to our courtesy professor Sue Lunte for also receiving an NSF CAREER award (all noted in the section on our young faculty, p.11).

Also of note are the very prestigious Self Fellowships (p.24) that are now available for entering graduate students. As noted within, these are unique awards in that they combine a graduate education in a given discipline with leadership training. The Department is grateful to Madison (AI) and Lila Self for providing such opportunities for young people.

A new endeavor taking the Department more solidly into the computer age was the establishment of the Physics/Chemistry Computing Resource Room (p.26). Special thanks go to the College of Liberal Arts and Sciences, the Department of Physics and Astronomy and Ken Ratzlaff and his crew for making this endeavor a big success. Both Chemistry and Physics received the funds from the College to purchase a number of computers for the effort. Because of the tremendous generosity of the Department of Physics and Astronomy in providing space, we were able to create a joint resource room with 20 computer stations.

The future looks bright for our department. Plans are being made for new faculty hires, a new science building, and initiatives for curricula changes in K-12 education as well as in the analytical sciences. All of this exciting news can be found in the ensuing pages.

Kristin Bowman-James
Professor and Chair

lated to environmental cleanup, and these grants help fund a portion of that research."

Bowman-James, Wilson, and Kuczera are working with faculty and students at KU and scientists at Oak Ridge National Laboratory, Oak Ridge, Tennessee, in developing molecules that selectively recognize negative ions, such as nitrates and phosphates.

The design and synthesis of molecules to selectively recognize and remove toxic species from nuclear waste, ground water, or soil is no mean feat.

"This project represents one of the major kinds of challenges we face with chemists," Wilson said. Efforts are being placed on building electrode systems for "sensing" specific anions and quantifying their concentration, as well as for "bulk" sequestration anions for removal from contaminated areas.

While Bowman-James, Wilson, and Kuczera develop separation technologies for negative ions, Busch and Givens are looking at the other half of the subject — developing methods of separation for positive ions using ligands.

"We know that there are ligands that bind with various positive ions," Busch said. "But there's a problem. There is a strong correlation between how tight and how fast they bind."

Currently, strong binding ligands are too slow to use effectively, Busch said. The goal is to develop ways to make ligands both strong binding and fast.

DOE is emphasizing university-related research because long-term costs for the environmental management program are estimated at \$200-\$350 billion over 75 years—the largest Cold War legacy of any other Federal program. The objective is to meet established goals in the shortest time possible using either existing technologies or those that could be developed and demonstrated within a few years.

The funds were obtained from the Energy Research Financial Assistance Program developed by DOE's Environmental Management Science Program, Office of Environmental Management.

"The program is designed to inspire "breakthroughs" in areas critical to the DOE's Office of Environmental management's mission," Bowman-James said. Projects are funded which are likely to provide scientific knowledge that will revolutionize technologies and cleanup approaches to significantly reduce future costs, schedules and risks.— *Dann Hayes, University Relations.*

New supercomputer on-line

Our thanks and congratulations go to Shih-I Chu, Watkins distinguished professor of chemistry, for spearheading a successful grant which resulted in the award of a Silicon Graphics (SGI)/Cray 16-processor SGI Origin 2000 supercomputer to a group of 13 faculty collaborators from KU, K-State, and Wichita State. The Cray is installed at the KU Computer Center and was operational in March. The \$550,000 acquisition has been financed via K*STAR NSF EPSCoR with 1:1 matching dollars from KU's Academic Computing Service.

The Origin 2000 is a Scalable, Shared-memory Processor (SSMP) system. It will be configured with 16 195 MHz R 10000 processors (each with 4 MB L2

cache), 4 GB of main memory, and over 100 GB of disk space.

Processors and memories are arranged in nodes, where each node includes 2 processors, 512 MB of memory, and a crossbar switch that connects the processors to the memory and



Dr. Shih-I Chu

both to other nodes in the system. Memory is distributed among all nodes in the system but functions as a single, shared address space. Each node is connected to a Cray Link routing subsystem via a 1.6 GByte/sec (sustained port). The routing subsystem allows interprocessor communication with a bisection bandwidth of 2.56 GByte/sec (sustained) for 16 processors that is linearly scalable to 128 processors. This system has displayed excellent performance on benchmarks submitted by KU researchers and by nationally-known benchmarks. Its architecture allows users to enjoy many benefits of both distributed memory and Shared Memory Multiprocessor (SMP) systems.

The KU system ranks:

- 460th among the most powerful computer systems in the world
- 240th among the most powerful computer systems in the USA
- 40th among the most powerful computer systems at academic institutions in the USA

Two other K*STAR NSF EPSCoR initiatives are in the works. Kansas will be the national testbed for CONDOR, which is to link computers so that un-

used cycle times are utilized. Thus, it is envisioned, for example, in the near future that the KU SGI/Cray Origin will be connected to KSU's 32-processor Convex Exemplar supercomputer. On campus, connections could be made between the Origin and other SGI workstations. This initiative also proposes linkage to the NCSA supercomputers at the University of Illinois. The second initiative is the formation of a cooperative partnership with the 6-Great Plains EPSCoR states of North and South Dakota, Nebraska, Kansas, Oklahoma, and Arkansas to develop a high-speed telecommunication "supertube". This latter initiative, still in its formative stages, would allow researchers in the region to develop virtual research and teaching organizations and projects for cooperative partnerships.

Dr. Jerry Niebaum of the Academic Computer Center did an excellent job in working with Dr. Chu and his group to negotiate the supercomputer for KU. He is also serving as the lead PI for the 6-Great Plains States' telecommunication grant to NSF EPSCoR.

Chemistry department earns fourth NSF grant

The Chemistry Department has received its fourth consecutive three-year Research Experience for Undergraduates (REU) grant from the National Science Foundation.

The grant—about \$159,000 for three years beginning with summer 1997—provides funds to bring 10 students each summer to the Lawrence campus to conduct full-time, quality research under the supervision of a faculty member active in research.

"The purpose of the award is to expose the undergraduates to the excitement of research at a critical time in their lives," said Barbara Schowen, professor of chemistry and REU program director. "The aim is to encourage talented individuals into research careers."

The program is open to undergraduates from accredited four-year colleges in Kansas and 17 Midwestern states, including Oklahoma, Nebraska, Iowa, Missouri, Arkansas, Minnesota and Colorado. Emphasis is placed on institutions without research facilities.

Students in the program are presented with an already well-defined project. Faculty research directors monitor the progress of each student.

"If the research project is successfully completed, the students and their mentors try to get their findings published," Schowen said. "For a student planning on further study in graduate school, getting published is at least as important as having good grades."

Under the program, students receive 10 weeks of full-time research experience in chemistry.

"There is a well-recognized need for highly

trained research scientists for the 21st century," Schowen said. "Chemists, in particular, will be needed to solve central problems in disciplines such as biology, environment and materials science."

One segment of the program provides undergraduate students with information about careers in chemistry and encourages them to enter those careers.

"There's a lot of competition for these grants," Schowen said. "The university is very appreciative of the program and sees this as an important way to advertise our research strengths and, in the bargain, to attract quality graduate students to Lawrence."—

OREAD, Vol. 21, Number 10, February 7, 1997

Kuczera wins Quest for the Best

Congratulations to Krzysztof Kuczera, assistant professor of chemistry, on winning a Quest for the Best Award! Quest for the Best is an annual faculty



Dr. Krzysztof Kuczera

competition designed to encourage and enable faculty to use technology in teaching that is sponsored by KU's Academic Systems for the Training and Use of Technology in Education Center (ASTUTE). In total, nineteen proposals were submitted and five out of that group were selected. This year, each winner received \$4,000 for hardware and software, and the services of a skilled student worker to complete the proposed project. "I'm very glad that I received this award," Kuczera said.

The goal of Krzysztof's project—*Web-based molecular modeling class for chemistry and biochemistry*—is to use web technology to create an integrated resource for teaching molecular modeling. Initially, this will involve creating a web-based version of BIOL 801 *Introduction to Macromolecular Modeling* for the spring 1998 semester. The special aspects of web technology—hypertext and multimedia—will be used to organize the difficult interdisciplinary materials and challenging technical details of computer simulations into a form accessible to students at different levels. This web-based course will contain integrated text, images and animation sequences illustrating aspects of molecular structure and dynamics. The course material will be hierarchically organized to serve students with different information needs, and will be integrated by hypertext links between lecture notes, laboratory exer-

cise manuals, case studies of actual research projects and soft documentation. Further expansion of the resource will enable its use in other undergraduate and graduate classes.

Probe and laser light allow study of individual molecules

A chance to study individual biological molecules in a liquid environment has been a goal of scientists for years.

At KU, Robert C. Dunn, assistant professor of chemistry, has reached that goal by improving on near-field optical scanning microscopy, a technique that can be used to look at individual molecules.

In instruments that use this process, the object to be viewed is placed close to a special fiber-optic probe. Laser light from the probe is used to view and study samples at extremely high magnification.

Dunn, along with Chad Talley, Lawrence doctoral student, and Gregory Cooksey, Quinter junior,

sites successfully using near-field optical microscopy to study biological samples," he said. "People thought it couldn't be done."

Dunn said the softness and fragility of biological samples have been a problem for near-field microscopy because of the way the probe is positioned.



Dr. Robert Dunn

The new tip design avoids many of those problems and opens up significant applications in the biological sciences.

"The cantilevered near-field tip brings less force onto the sample, making it much gentler," Dunn said.

"The way we sense when the probe is near the samples is by vibrating the probe back and forth and watching the amplitude of that movement."

"When the probe gets close to the sample's surface, the movement of the probe's tip is reduced by the sample", he said. "This is used to regulate the tip position above a specimen and to follow contours in its surface."

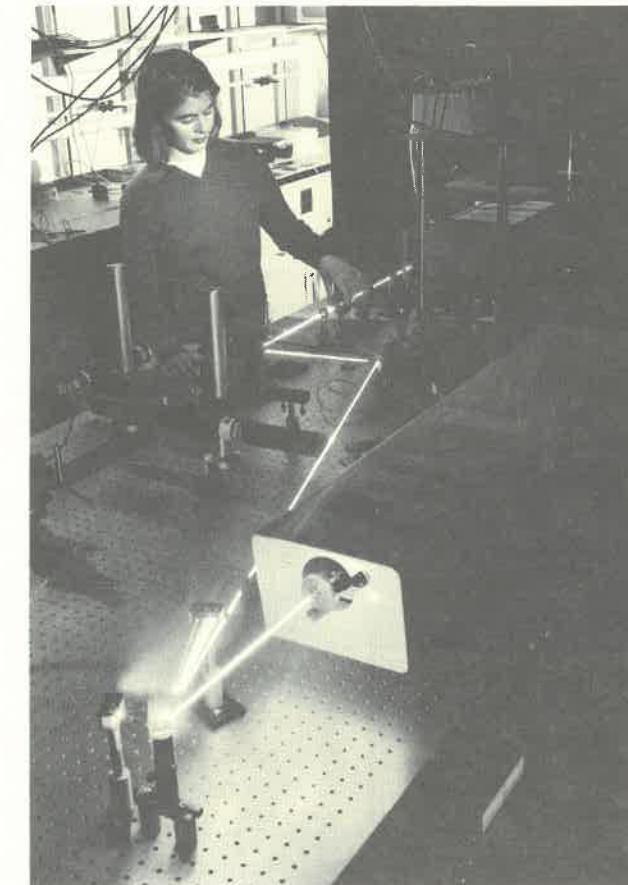
"With the straight tip, the problem is that when you start going through water, the water itself reduces the vibration of the tip," Dunn said. "With our tips, we vibrate vertically with respect to the sample so you don't get the large damping caused by the water."

With the high sensitivity of near-field scanning optical microscopy and the newly developed cantilevered probe, researchers can examine individual biological molecules. "It's important to see what single proteins do and map their distribution in a system," he said. "If you can understand that, it can lead to a better understanding of how protein changes affect biological processes."

By studying a single molecule, "we can examine how the molecule moves very precisely," he said. "For us, we plan to use this to watch a single protein ion channel open and close."

The near-field scanning optical microscopy technique is relatively young. Although the fundamentals were mentioned in a series of letters between Edward A. Syge and Albert Einstein, near-field optical microscopy didn't become practical until 1991.

Dunn has been active in the field since 1992, when he carried out a postdoctoral fellowship with X. Sunney Xie at the Pacific Northwest Laboratory, Richland, Washington.



have designed a new "cantilevered" probe, which features a near-90-degree curve.

"With these new probes, we are one of the few

"It's great getting in on the ground floor," Dunn said, "Everything you see is new."—*OREAD, Vol. 21, Number 9, January 24, 1997.*

Chemistry department praised for recycling—program returns hazardous materials for safe disposal

Recycling anything and everything has been a goal of the department of chemistry for years and, as a result, the effort has saved KU \$5,000.

Susan McAfee, director of chemistry laboratories, said the department placed an advertisement in the *Lawrence Journal-World* last January to find someone to dispose of the hazardous material created by the department.

"We wanted to get the best price for our material, and after looking through the bids, we chose the one who would pay us the most, McAfee said.

Previously, mercury was sent back to the manufacturer to be cleaned, then returned to the department for reuse.

D F G Mercury Corporation of Evanston, Illinois, was chosen for the job. The company paid the chemistry department \$1.45 per pound of mercury, with approximately 950 pounds being recycled. This netted the department more than \$1,300.

If the department would not have found a business to recycle the material, it would have had to call a hazardous waste materials removal company, which would have charged about \$5,000 for its services.

McAfee said she had been working on the recycling project months before the materials were hauled away in February. Metallic mercury had been stored

in the basement of Malott Hall for several years, and the department sought ways of disposal.

"We had too much on hand, so we were trying to cut back," McAfee said. "It is a hazardous material and having a lot is dangerous."

McAfee said the mercury came from a variety of sources, including thermometers. The mercury was placed in seven containers for storage, each about the size of a fire extinguisher.

McAfee said the containers were very heavy. One pound of mercury fits into a container the size of a small eye dropper.

In addition to large recycling projects, the department of chemistry recycles cardboard boxes, office paper, styrofoam, newspapers, packing materials, catalogs and even junk mail, McAfee said.

She said volunteers from the department took all recyclable materials to Wal-Mart on their way home, and everyone in the office did their part.

"One of the reasons we recycle is to save the University money," McAfee said, "but we do it for the environment as well."

Mike Russell, director of the department of environmental health and safety, commended the department of chemistry for their recycling efforts.

"Compared to everyone else, they are probably the leaders in chemical recycling, reuse, and reduction," Russell said. "People have worked on recycling in every department, but chemistry is probably at the top."

Russell said the department of chemistry contacted him prior to recycling the mercury and asked for help. Together, they searched for ways to dispose

of the materials, and recycling was the best way. Russell said he tried to spread the word on what needed to be done to help the environment.

"We send out things to all departments about recycling, pollution prevention, and minimizing waste," Russell said. "Few inform chemical users of the different things they can do to cut down on volume."

Former KU Chancellor Deane W. Malott dies

Former Chancellor Deane W. Malott, 98, died Sept. 11 at his home in Ithaca, New York. Malott was KU's eighth chancellor, serving from 1939 to 1951. He was known for his efforts to beautify the campus and instrumental in bringing many military training programs to KU during World War II.

Chancellor Malott was the first KU Alumnus and native Kansan to serve as a KU chancellor. A native of Abilene, he graduated from KU's College of Liberal Arts and Sciences in 1921.

Malott earned a master of business administration degree from Harvard and served as assistant dean of Harvard Graduate School of Business until 1929, when he left the school to become vice president of Dole Pineapple Co. He returned to Harvard business school as associate professor and assistant dean in 1933. During World War II, Chancellor Malott kept KU's campus busy by convincing the federal government to use KU as a center for military training. He also instituted new courses of particular use to women for the war effort, including occupational therapy, physical therapy and engineering drawing.

In 1940, enrollment was 4,354 students, but it never dropped to fewer than 2,700 during the war. In the last year of the war, 1945, enrollment was 3,808; in 1946, it jumped to 9,004 and to 9,491 in 1947.

Chancellor Malott began a building program that added Malott Hall, Allen Field House, and the World War II Memorial Campanile and Drive, and renovated Fowler Shops—now Stauffer-Flint Hall—and expanded the Kansas Union. To cope with the postwar housing shortage, he began the student housing system.

Malott was well-known for his ability to work with the Kansas Legislature. KU's annual operating budget from the Legislature was about \$1.2 million when he arrived. It was \$6.5 million when he left. He also started the first program of state-supported research.

Under the leadership of Malott and his wife, 1,200 crab apple trees that still beautify the campus were planted.

Chancellor Malott left KU in 1951 to become president of Cornell University, a post he held until 1963, when he became president emeritus of Cornell.

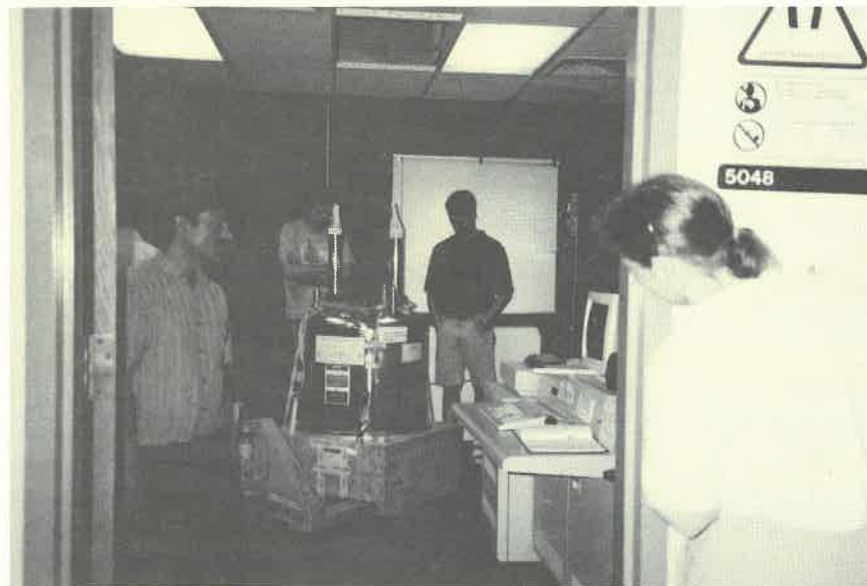
Chancellor Malott served as the chair for the World War II Memorial Carillon Endowment Fund Campaign. He and his wife made a cash gift of \$34,174 to the campaign. In 1951, he received KU's Distinguished Service Citation, and in 1988, he received the Fred Ellsworth Medallion from the KU Alumni Association.

Survivors include a son Robert (B.A., 1948) currently CEO of FMC, Corp., Chicago, IL; 2 daughters, nine grandchildren and nine great-grandchildren.—*Excerpts from OREAD, Vol. 21, Number 3, Sept. 20, 1996*

Crumbling classroom repairs begin

For the next two summers construction workers and chemistry students will co-occupy the hallways of Malott Hall. Last spring Governor Bill Graves signed the Crumbling Classrooms bill which allocated \$161 million in government bond money for improvements to the state's six Regents' institutions. KU will receive \$42 million of those funds, which will be disbursed campuswide to repair classrooms in 13 buildings.

Slated for work in Malott this summer are two of our six general chemistry teaching laboratories, two of our three organic chemistry teaching laboratories, one physical chemistry laboratory, and the two large lecture rooms, 1001 and 1003, in addition to several small classrooms. The Malott portion of the crumbling



(l. to r.) Dimuthu Jayawickrama, Dave VanderVelde, Shawn Mansfield and Martha Morton looked on last summer as the 360 MHz Bruker AM NMR spectrometer donated by Monsanto finds its new home.

Deja Vu

As an illustration that problems of inadequate facilities are always with us, Professor F. E. Stimpson, the first professor of physics and chemistry at the University of Kansas, in a report to the Regents on November 17, 1874 says:

This Department is at present in need of considerable apparatus for analytical work and of some chemicals; indeed these wants have seriously impaired the efficiency of the laboratory during the present term. The chemical lecture room in the basement (in which the lectures are now given under the greatest disadvantage) should be partially equipped. It should at least have a floor, a lecture table furnished with gas and water pipes, and a blackboard, none of which it has at present. Instruction can not be given with the greatest profit to the students or with satisfaction to the teacher till this is done.

E.H.S. Bailey, H.P. Cady, and F.B. Dains, History of the Chemistry Department of the University of Kansas, Bulletin of the University of Kansas, XXVI, Kansas State Printing Plant, Topeka, Kansas, February 15, 1925.

classrooms project will be completed next summer when the remaining three general chemistry and one organic chemistry teaching laboratories are renovated.

Schowen receives Midwest Regional Award

K. Barbara Schowen received the Midwest Regional Award in Mentoring Undergraduate Research at the ACS regional meeting in Sioux Falls, South Dakota, in November.

Dr. Schowen received her bachelors degree in chemistry from Wellesley. She studied organic chemistry and minored in biochemistry, obtaining her Ph.D. from Massachusetts Institute of Technology in 1964.

Barbara took a position in the Chemistry Department at Baker University in Baldwin City, Kansas, where she rose to the rank of associate professor in 1967. During this time period she spent summers in the laboratory of Professor Edward E. Smissman of the medicinal chemistry department at KU. Her work there included elucidating the mechanism of the Prins reaction and investigations of conformational and mechanistic aspects of acetylcholinesterase-catalyzed hydrolysis reactions.

In 1977, Barbara accepted part-time appointments in the departments of chemistry and biochemistry at KU, where she devoted her attention to undergraduate education, teaching, and advising students. She was elected in

1988 to the Kansas Women's Hall of Fame and has received recognition from various student groups for excellence in teaching.

Dr. Schowen became associate professor and coordinator of undergraduate studies in 1987. In 1995, she was promoted to full professor and was named associate chair for undergraduate studies. In August 1996, Barbara was named director of KU's Honors Program.

Barbara's research interests lie in the area of organic, bio-organic and biochemical reaction mechanisms. Much of the work carried out by the undergraduates has been presented at regional, national and international scientific meetings including Gordon Research Conferences and at the International Union of Pure and Applied Chemistry meetings. She has authored and co-authored numerous papers and chapters dealing with solvent isotope theory and techniques.



Dr. Barbara Schowen

Dr. Schowen has been recognized nationally for her leadership in publicizing the educational importance of undergraduate research for science majors. She was the co-PI for an NSF-sponsored national Workshop on Research held in 1992. At the University of Kansas she has coordinated more than eleven years of highly successful summer research participation programs including NSF-URP and NSF-REU site projects.

Exchange student to stay extra year

Everyday Maoping Song goes into a laboratory in 1014 Malott to separate, purify and identify chemicals.

Song, the current exchange scholar from Zhengzhou University of Henan province in China, is part of a chemistry research team headed by Kristin Bowman-James.

"When a former exchange scholar told me about the good research environment at KU, I decided to apply for this program and continue my research in Kansas," Song said.

The exchange program with Zhengzhou University is one of the oldest exchange programs at the University of Kansas.

The University established this exchange program in 1980 when it was still unusual for U.S. universities to have formal arrangements with institutions in the People's Republic of China.

Under the exchange program the University



Kristin Bowman-James (center) with Maoping Song (left) and the members of the Zhengzhou University delegation

of Kansas sends one student of Chinese culture and language to Zhengzhou University while Zhengzhou sends one scholar to Kansas.

Since March 1996, Song has taken Applied English Center classes to improve his English writing and listening skills. He is also working on synthesizing

molecular macrocycles, which are compounds that could be used in decreasing pollution when combined with other metals.

Song's exchange program would have ended this March if it hadn't been for a grant he received from the KU chemistry department to stay another year.

"My advisor, Kristin Bowman-James got another project from the U.S. Department of Energy which is related to the research I'm currently working on, so I will be able to stay for another year," he said.

In mid-January, Song had an opportunity to see some of his colleagues from Zhengzhou University



Joe Heppert checking out one of the twenty-two new Pentium computers in the joint Chemistry/Physics Computing Resource Center, which opened Fall 1997.

when a delegation of four professors came to visit the University of Kansas.

This was the first visit of a delegation from Zhengzhou University in 12 years.

Qiangping Dai, chairman of university affairs at Zhengzhou University said that the reason for the long interval since their first visit was because they had ties with universities from 10 other countries, which made it difficult to have frequent visits.

"The purpose of our trip is to pay a visit to the six American universities with which we have sister relationships," Dai said.

He said that the delegates were pleased with the warm welcome they received from faculty and students and that they were hoping to expand and further promote their relationship with the University.

Song, who accompanied the delegation from Zhengzhou during their visit to the University said that he had received great help from the KU faculty and students.

"I hope to build a long-term cooperation with the KU chemistry department that would continue even after my return to China," Song said. — *Kansan*, January 22, 1997

Planning grant aimed at reforming undergraduate education for K-12 teachers

Chemistry's Joe Heppert with Bill LaShier from curriculum and instruction in KU's School of Education want to reform undergraduate education for K-12 science and mathematics teachers in Kansas. They received a \$50,000 NSF EPSCoR educational planning grant to help them develop the elements of their Kansas Program for Excellence in Teacher Preparation Program (KanCETP). Follow-up grants for additional funding are in the works.

In summary, KanCETP infuses hands-on, research-driven science and mathematics learning into teacher education curricula among Kansas' Regents universities, its smaller regional universities and the 19 member Kansas community college system. It has four principal aims:

1. To create an inquiry-based, undergraduate science, mathematics, engineering and technology (SMET) curriculum for the preparation of K-12 educators. This curriculum will stress inquiry-learning experiences and field ex-

periences in foundational courses and integrate major concepts in identified topical areas in science and mathematics into senior-level courses.

2. To assimilate Kansas' undergraduate science and mathematics education majors into the research teams of SMET faculty at Regents universities. These majors will develop mini-research projects for K-12 instruction based on research in the host laboratory and will implement the inquiry mini-unit during their student teaching experiences.

3. To develop partnerships between school districts, universities and business that reflect areas of current and future state technological investment.

4. To evaluate how these new paradigms affect the performance of beginning teachers and how these new approaches affect students' K-12 science and mathematics performance as outlined in national and state standards.

"We encourage interested science and education faculty at Kansas institutions to contact us," says Heppert. "We will be making some site visits to develop some cooperative plans for faculty around the state."

Those interested can contact Heppert at jheppert@caco3.chem.ukans.edu or visit the KanCETP web site <http://www.chem.ukans.edu/chem/acs/mseed.htm>.

Theory institute sparks medical breakthrough

Can mathematicians, computer scientists, and physicists play a role in a medical breakthrough? You bet, and a group of KU and KUMC researchers did just that!

The NSF EPSCoR Kansas Institute for Theoretical and Computational Science, directed by Watkins distinguished professor of chemistry Shih-I Chu, was created in part to break down traditional research barriers and to foster scientific collaboration. This year, a group of institute collaborators (Dorfmeister and Lerner, mathematics; Ralston, physics; Osorio, Wilkerson, and Ingram, KUMC; Ratzlaff and Peters, chemistry instrumentation design) applied advanced problem-solving techniques and sophisticated computer technology to a puzzle medical researchers have long tried to unravel: the nature and behavior of epileptic seizures.

What they discovered may lead to a patentable device that will help people with epilepsy predict their seizures and prepare for them. With this new capability may also come the ability one day to stop or mitigate the seizures.

Routinely, scientists have charted electroencephalograph (EEG) signals on paper while a person was having a seizure. But the only thing they could say with certainty was that a seizure was occurring. The mass of squiggles told them little else.

The signals are difficult to interpret, and understanding the meaning of the multiple of channels and the cross-correlations between them seemed impossible. To appreciate the researcher's difficulty, imagine high-frequency signals being recorded on your home computer at over 15,000 data points per second. One full day of brainwave data could fill over 1,000 floppy disks!

The signals also seemed too random to lend themselves to interpretation—that is until the Institute's researchers tackled the problem.

Using ideas, advanced mathematical methods and high-speed computers that have been purchased with NSF EPSCoR funds, they dove into months of data collection and analysis. To their surprise, they found the seizures had a pattern and that certain patterns indicated a seizure was imminent. The result

was a major breakthrough in a deeper understanding of epileptic seizures.

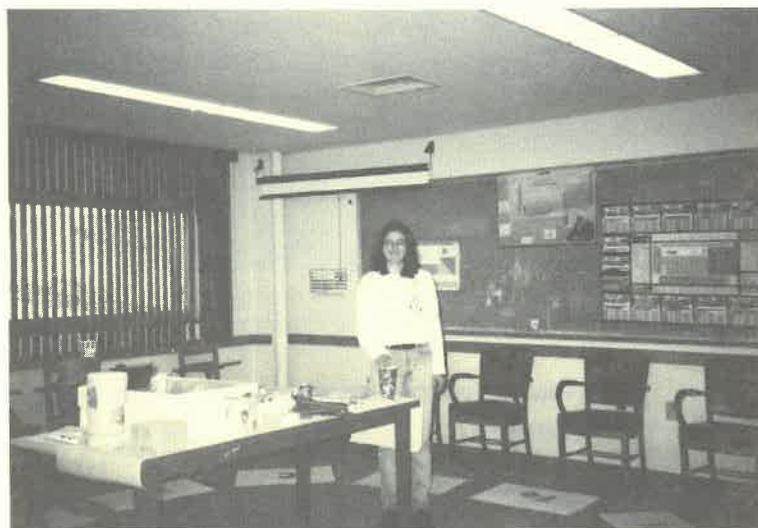
KTEC reported in its January/February 1997 KTECnology that Lawrence-based Flint Hills Scientific, L.L.C., is collaborating with the University of Kansas on patent filing, engineering, testing and refinement of this technology.

Slime pit makes chemistry fun for kids

Children of all ages got a chance to run their fingers through "slime" at the 3rd Annual Carnival of Chemistry at KU.

The carnival, sponsored by KU and the American Chemical Society, is held each year in November in conjunction with National Chemistry Week.

"The carnival is directed at all elementary-school children with a focus on fourth- and fifth-graders," said Martha Dolan Morton, a research associate



Graduate student Michelle Kennedy puts the finishing touches on the elemental cookie walk just before the Carnival.

with the Nuclear Magnetic Resonance Laboratory. "However, 1- and 2-year-olds also enjoy the carnival, as well as their parents and grandparents."

Demonstrations and hands-on events included face painting, an elemental cookie walk, a mystery room and the "slime pit," where participants made their own slime. The "slime pit" is the big favorite, Morton said. A chemistry show was performed by Grover Everett, Chancellors Club teaching professor of chemistry.

Included for the first time was the dark room, where participants saw how lasers work, and a food chemistry room with demonstrations of the use of yeast and baking soda for making bread.

Last year more than 1,000 students and adults took part in the carnival. Plans are already in the works

for this fall.

Two new faculty onboard

Andrew S. Borovik, new assistant professor of inorganic chemistry with interests in organic as well (I/O), received his B.S. degree from Humboldt State University and Ph.D. from the University of North Carolina at Chapel Hill in 1986. He has been a postdoctoral associate at both the University of Minnesota and Berkeley, and has done research at Oregon State University—Corvallis; Woods Hole Oceanographic Institute in Massachusetts; and at Duke University Marine Laboratory in Durham, North Carolina. Andy's research interests include inorganic, organic and supramolecular chemistry. Ongoing projects include the design of metallocavities



Dr. Paul Hanson

and metallo-network polymers as metallo-protein mimics and as homogeneous (the former) and heterogeneous (the latter) catalysts. Andy has received a FIRST Award from the National Institutes of Health, along with other grant funds. He has also garnered teaching awards from the University of North

Carolina—Chapel Hill and Kansas State.

Paul R. Hanson, new assistant professor of organic chemistry (O), received his B.A. degree from Luther College in Decorah, Iowa, and his doctorate at the University of Minnesota in 1993. He was a National Institutes of Health postdoctoral fellow at Stanford University, Stanford, California, from 1993-1996. Among Hanson's honors, in addition to the NIH fellowship, are a dissertation fellowship at the University of Minnesota, Minneapolis, and the Lee Irving Smith Stainless Steel Beaker Award at Minnesota.

Paul's interests lie in the development of new methodologies to synthesis, with applications to total synthesis, asymmetric synthesis of alpha-amino phosphonic acids and other biologically significant targets, as well as novel sigmatropic rearrangements.

Chemistry lands two Department of Defense grants

In April 1996, the U.S. Department of Defense



Cindy Larive and daughter Erin watch as graduate student Shawn Mansfield demos programs at the Fall opening of the Chemistry/Physics Computing Resource Center.

(DOD) awarded two, three-year grants to KU Chemistry under the DEPSCoR program directed by Peter Sherwood of Kansas State University. In total seven grants were awarded in Kansas totaling \$2.09 million, including Kansas Technology Enterprise Corporation matching funds.

KU professor Peter Hierl's project: *Gas-phase reactions of negative ions at hyperthermal energies*, received \$379,000 in funding. Assistant professor Andrew Borovik's project: *Metallo-network polymers: Biomimetic metal binding/recognition sites*, was funded at \$320,000.

Department's junior faculty are going strong

Our junior chemistry faculty members were the delighted recipients of numerous awards and honors this year. They're off to a great start!

Cynthia K. Larive, assistant professor, was honored this year with the prestigious Eli Lilly New Faculty Grant—\$10,000 per year, renewable for a second year. This is an unsolicited award made nationally to one untenured analytical chemistry faculty member each year. In addition to the Lilly Award, Cindy was named a Kaw Valley Girl Scout Council Woman of Distinction—an award made to women who have "reached for the stars" and distinguished themselves in the areas of science and technology.

New assistant professor Paul R. Hanson received a \$125,000 grant award from the ACS Herman Frasch Foundation. This is a grant to nonprofit incorporated institutions to support research in the field of agricultural chemistry which will be of practical benefit to agricultural development.



Last summer students from KU's Math and Science Center spent two weeks in Malott Hall labs.

In addition to being awarded a prestigious NSF CAREER Award for \$350,000, assistant professor Robert C. Dunn was named a Searle Scholar—the first time this prestigious award has been presented to a KU chemistry faculty member. Searle supports research in medicine, chemistry and biological sciences. These grants are made to selected universities to support the independent research of outstanding individuals who are in the first or second year of their first appointment at the assistant professor level, and whose current appointment is a tenure-track position. The award is \$180,000.

New courtesy associate professor of chemistry and associate professor of pharmaceutical chemistry Sue Lunte was also the recipient of an NSF CAREER Award of \$240,000 and the 1997 Agnes Fay Morgan Award. The national honor, awarded by Iota Sigma Pi, the national honor society for women in chemistry, is presented to a woman chemist younger than 40 for significant achievement in chemistry research.

KU ACS Section participates in family Halloween

The heart of the KU campus teemed with ghouls and goblins during the Dark at the Top of the Hill, a family Halloween celebration. Even Baby Jay donned a mask and joined in the festivities.

The Dark at the Top of the Hill was sponsored by the KU Natural History Museum and Museum of Anthropology, along with the Kansas Chapter of the American Chemical Society, the Kansas Union and students in the master of historical administration and museum studies program. The events featured special exhibits and activities for children and adults, including the following:

Los Días de Los Muertos. Spooner Hall Mu-

seum of Anthropology presented its new exhibit *Days of the Dead*. The exhibit illustrated the important Hispanic festival honoring dead ancestors, friends, and family members. Included in the exhibit were replicas of a household offering and a collection of Days of the Dead toys.

Museum After Dark. The creatures on exhibit at the Dyche Hall Natural History Museum revealed their nocturnal habits to those who searched them out with flashlight during the lights-out celebration. Scientists haunted the halls with strange and wonderful beasts, and Operation WildLife displayed some birds that rule the night.

Monster Molecules. Visitors saw spectacular sights and heard strange sounds as the American Chemical Society unleashed the power of molecules during a show in Woodruff Auditorium, Kansas Union.

Games and Activities. With the help of museum studies graduate students, children enjoyed spirited games and activities on the fourth floor of the Union. There were also physics demonstrations on the fourth floor, courtesy of the KU Physics Club.

Participants were encouraged to come in costume and bring flashlights.— *OREAD*, Vol. 21, Number 5,

100 years ago in 1896...

On October 2, 1896, the Lawrence Journal World reported:

Kansas University this morning received forty boxes of chemicals and apparatus for the chemistry department direct from Germany. The freight on the load was about \$400. There was over a carload of it. The teams had an all day job hauling it up the hill.

Courtesy Watkins Community Museum.

Oct. 18, 1996

Sabbaticals and promotions

Shih-I Chu, Watkins distinguished professor of chemistry, spent the spring semester visiting Berkeley and Academia Sinica, Taiwan, for research interactions and the development of new theories for the study of atomic and molecular processes in superintense laser fields.

Craig E. Lunte was approved for promotion to full professor beginning with the 1997-98 academic year.

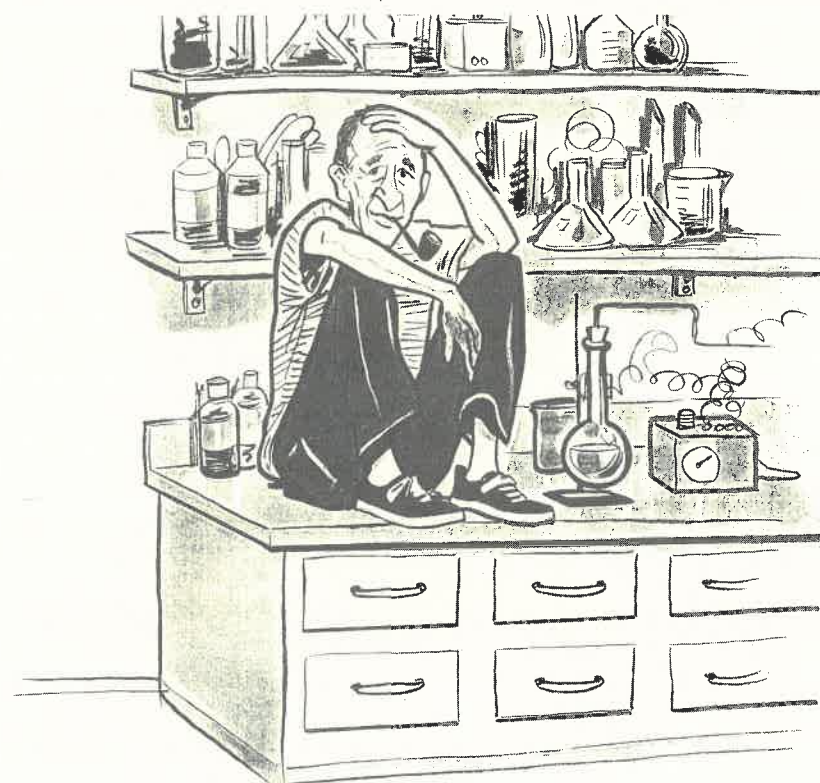
Carey K. Johnson, associate professor, was

approved for sabbatical at the Pacific Northwest National Laboratory in Richland, Washington, where he will research the behavior of single molecules and ultrafast molecular dynamics, based on advanced methods of laser spectroscopy and detection.

Adams wins Oesper Award

The Oesper Award symposium honored Dr. Ralph N. Adams, chemistry professor emeritus, with the 15th Oesper Award on November 8, 1996, at the University of Cincinnati.

The Oesper Award, named for R.E. Oesper, recognizes an outstanding chemist each year. Adams presented *Recent Findings in the Neurochemistry of Schizophrenia*. The program also featured the first and last scientists who conducted their doctoral studies under Adams. The first, Dr. Ted Kuwana, is Regents distinguished professor of chemistry at KU and director of the EPSCoR K*STAR program to stimulate competitive scientific research in Kansas. Kuwana lectured on *From Carbon Paste to High Surface Area Carbon Fibers*. Adam's last doctoral student, Dr. Kim Mitchell, is an assistant research professor with the Higuchi Biosciences Center for Neurobiology and Immunology Research (CNIR). She discussed *In Vivo Electrochemistry: Monitoring Chemical Changes in the Functioning*



Brain. Also attending were former students Don Leedy (Ph.D. 1968) now at Procter and Gamble and Rick McCreery (Ph.D., 1974) who is at Ohio State.

Adams joined KU in 1955. His initial research focused on electro-oxidations at solid electrodes and the mechanisms of organic electrode reactions. In 1969, he began applying electrochemistry to problems in the neurosciences. During the rest of his career he has focused on applications of electroanalytical methods to the neurosciences and neurochemical studies of schizophrenia. Adams retired from teaching in 1992 but still conducts research in schizophrenia and brain chemistry. — *HBC News*, January 1997

Honors introductory series complete

The Chemistry Department now has a complete introductory honors course series in place. The first course, CHEM 185 *Foundations of Chemistry I, Honors (5)* was offered for the first time during the Fall 1996 semester and enrolled about 45 students. The second, CHEM 189 *Foundations of Chemistry II, Honors*, was offered in a new format, independent of CHEM 188, for the first time in the Spring of 1997, enrolling 35 students. The third course in the honors series, CHEM 628 *Organic Chemistry I, Honors*, will be taught

for the first time in Fall 1997 and is the first semester of the two semester organic sequence. Then in Spring 1998, the Department will offer CHEM 630 *Organic Chemistry II, Honors*, which completes the series.

Ted Kuwana directs NSF-funded project for reforms in analytical sciences curriculums

For about a year, educators in the analytical sciences, representatives from industries that hire analytical scientists and members of

the NSF have been meeting to discuss changes in undergraduate analytical science curriculums.

They identified several issues that seem to prompt a need for curricular changes. First, undergraduate analytical science curriculums in most departments nationwide have not kept pace with rapid changes in technology and a move to evermore sophisticated sampling and measurement techniques.

The number of students graduating in the analytical sciences also has not kept pace with the mushrooming demand for analytical scientists. Fields such as agriculture, materials science, environmental sciences, and biotechnology have increased the need for people who can gather and analyze small samples with sophisticated equipment.

Industries that rely heavily on an analytically skilled workforce report that fewer people come on board equipped with the necessary communication and problem-solving skills. Industries are now looking for ways to communicate their needs to the educational institutions that prepare students for today's jobs.

In October 1996 in Leesburg, Virginia, and again this past March in Atlanta, about 40 people met for two, two-day workshops to discuss the state of undergraduate education in the analytical sciences, particularly analytical chemistry. The National Science Foundation's Division of Undergraduate Education and Division of Chemistry funded these workshops, and Ted Kuwana is the project's director.

Workshop participants came from 2- and 4-year colleges, graduate and postgraduate programs, industry, and government as represented by the NSF, the FDA, and the EPA.

The curriculum project coincides with the NSF's goal to encourage change in the education and training of undergraduates in science, math, engineering, and technology (SME&T). In its 1996 report, *Shaping the Future*, a review of undergraduate SME&T training and education, the NSF identified several areas of concern for SME&T competency in America.

It specifically addressed the growing U.S. need for a technically skilled workforce and sounded the alarm that current SME&T education will not help America satisfy that need. It called for nationwide action by government, industry and the higher education community to address and strengthen the current weaknesses in SME&T undergraduate education.

Curricular Developments in the Analytical Sciences, a report on the recommendations that emerged from the workshops, will be published later this summer. It addresses the NSF's concerns as they apply to the analytical sciences.

The report offers recommendations, suggested implementations and a summation of the workshop discussions. The booklet also will include examples of best educational practices occurring in the classroom or in industry and also participant comments on topics

ranging from programs for minority students to short courses to keep educators on the cutting edge of technology and industry needs.

In their final meeting, workshop participants focused on five areas that could contribute to improvements in undergraduate education in the analytical sciences. The recommendations address these five areas:

- Partnerships between industry, academic and government
- Course content and learning modes
- Technology
- Faculty development
- Follow-up and dissemination

A sixth area, assessment and evaluation, is still under discussion.

Anyone interested in receiving a copy of the final report should contact: Ted Kuwana, University of Kansas, Department of Chemistry, 2010 Malott Hall, Lawrence, KS 66045, TEL: (785) 864-3015, EMAIL: tkuwana@caco3.chem.ukans.edu.

New science building under consideration

KU is considering a \$55 to \$60 million learning center to house undergraduate student science laboratories and classrooms. The building would be about 232,000 gross sq. ft. or about 70 percent of the size of Malott Hall.

The need for building can be demonstrated, said university architect Warren Corman, but securing construction funding may be difficult. Under the current scenario, KU would probably seek some combination of private donations, state appropriations, and possibly the issuance of bonds.

Following a recent design charette by a private architectural firm, a suitable site was identified east of Malott Hall and northeast of Haworth Hall. As envisioned, the building consist of six levels above a parking level, two interconnecting bridges to Malott, a service bridge to Haworth, and other bridges to the north that would allow students to have outside entrances on every level except six.

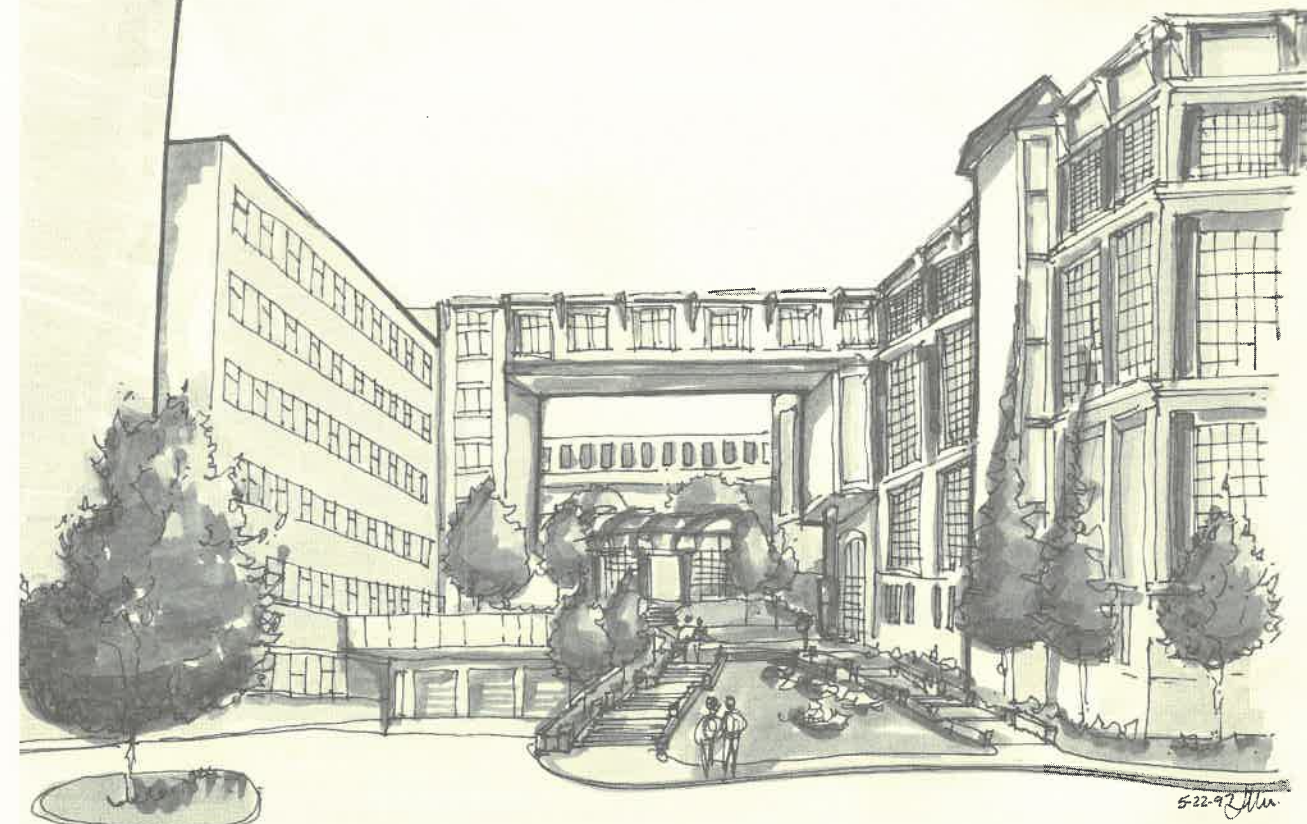
If the construction were to begin by the year 2000 or 2001 the building would be ready for occupancy by 2003. Given the magnitude of the project, it might be built in phases.

John Landgrebe, professor of chemistry, has participated in discussions over the past five years that have focused on upgrading academic space for biology, chemistry, physics, geology and other sciences. "We're really hoping to solve a whole host of problems with this," Landgrebe said.

In addition, he said, plans for the new hall in-

New Science Building

The Dream

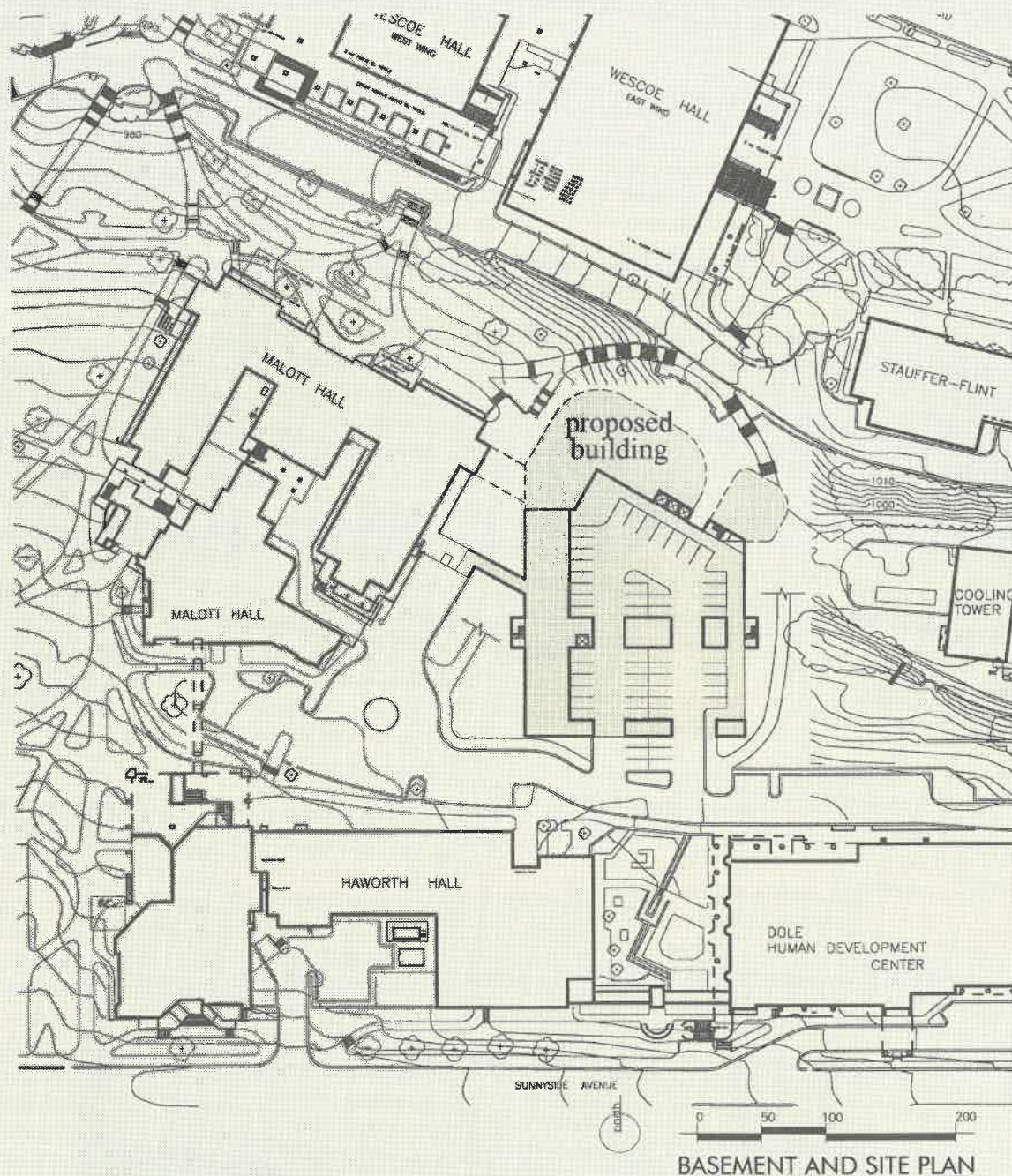


SKETCH 6

Undergraduate
Natural Sciences
Laboratory Learning Center



Looking north toward Wescoe from the loading dock and parking area on the East side of Malott.



Undergraduate
Natural Sciences
 Laboratory Learning Center
 The University of Kansas

clude a planetarium for the physics department to view celestial motions.

"It would not only serve students but also serve the public," said Landgrebe.

Once a new building is on line, he said, existing Malott Hall space could be remodeled for use by faculty and graduate student researchers.

The science building is contained in a summary of capital improvement requests from state universities to the Kansas Board of Regents. — *Update of an original article appearing in the Lawrence Journal-World, April 11, 1997.*

Schowen named director of the Honors Program

Barbara Schowen, professor of chemistry, is the new director of the Honors Program. Schowen has been at KU since 1977.

"Most of my professional life has been devoted to undergraduate education and advising. I enjoy helping undergraduates and helping them to get the experiences that will allow them to grow," Schowen said. "This position is just a logical extension of what I've been doing for many, many years."

Schowen said the number of entering students in the Honors Program had increased this year. "We normally have about 250 students, and the preliminary figures show over 300 this year," she said.

Honors students take Honors courses, which are smaller and more challenging than many regular courses. The students also have the opportunity to work with top professors on special projects and research.

To join the program, students typically must be National Merit finalists, Summerfield or Watkins-Berger scholarship recipients, have American College Test composite scores above 31, or have Scholastic Aptitude Test scores above 1,340. The program is open to other qualified and motivated applicants, Schowen said.

One of her goals for the Honors Program, Schowen said, is to increase the number of Honors courses. She said it was important not only to increase the number of courses for freshmen but also to provide more choices at the junior and senior level. She also advocates offering more interdisciplinary courses.

"Another goal would be to see how we can provide more Honors opportunities for students in the professional schools," she said. "It's important for people to realize that it is a university-wide Honors Program, and that we need to serve all of the students at the University."

Schowen took over for James B. Carothers, associate dean of the College who became acting di-

rector after the death of J. Michael Young in 1995.

Schowen has taught a number of Honors courses and was an organizer of *Science, Technology, and Society*, an interdisciplinary Honors course that has been offered every other year since 1989. She has served as associate chair for undergraduate studies in the Chemistry Department.

Statewide EPSCoR conference focuses on science and technology infrastructure

Governor Bill Graves praised faculty researchers and the Experimental Program to Stimulate Competitive Research (EPSCoR) in his keynote address to the Fourth Annual Statewide Conference entitled *Enhancing the science and technology infrastructure in Kansas through EPSCoR* held at the Kansas Expocentre in Topeka on February 20-21, 1997.

"You are at the forefront of making Kansas a better place for all of us to live and work. I encourage you to stay the course, for your work and developments impact the quality of our lives," the Governor said.

Ted Kuwana, project director of the K*STAR NSF EPSCoR program, opened this year's conference by explaining the purpose of EPSCoR. "Our goals are to stimulate sustainable improvements in the state's science and technology infrastructure and to increase the ability of researchers to compete for federal funding."

K*STAR, the first EPSCoR program in Kansas, uses several strategies to stimulate sustainable improvements in the state's science and technology infrastructure and to increase the ability of researchers to compete for federal funding. Faculty can apply for First Awards to seed their research efforts, Travel Awards to explore grant opportunities with federal agencies, and Enhancement Awards to build nationally competitive research programs. K*STAR also reviews and submits up to three Standard Grants to NSF each year and seeds educational projects and planning activities leading to the development of large-scale improvements and funding proposals.

According to Bruce Peterman, chair of the EPSCoR Committee in Kansas, EPSCoR is achieving its goals. The number of research proposals submitted and the amount of funding received has increased since the state entered the NSF EPSCoR program in 1992.

Mr. Richard Bendis, president of Kansas Technology Enterprise Corporation (KTEC), cited EPSCoR as a model for federal-state partnerships. The program gives states the flexibility to meet local needs, assures quality through peer review of proposed projects, main-

tains accountability through regular evaluation of funded initiatives, and leverages federal and state funds to achieve common goals.

In total, Federal agencies have awarded \$14.4 million to EPSCoR research proposals and Kansas has matched this amount with \$14.2 million. Kansas now participates in EPSCoR programs with the National Science Foundation, the Department of Defense, the Department of Energy, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Institutes of Health.

Conference guest speaker, Dr. Irving Shain, chancellor emeritus of the University of Wisconsin—Madison, described other strategies to increase research funding. Universities can expedite grant and contract procedures and create an environment on campus that rewards entrepreneurship. Dr. Shain recommended adopting intellectual property and patent policies that reward faculty and create income for the university.

At UW—Madison, an Office of Technology Transfer evaluates inventions for their commercial potential, processes patent or copyright applications, and determines the best approach to commercialization. An Office of Business Development assists faculty in writing business plans, provides advice in seeking initial funding, and helps obtain accounting, tax, personnel and legal services. A university research park provides incubator space for start-up companies and encourages partnerships between business and university researchers.

Other conference speakers included Dr. Charles Holt, director of technology research at the Midwest Research Institute, Dr. Don Pederson, chair of the EPSCoR Foundation, and Dr. Charles Warren, president of Kansas, Inc. More than 125 participants attended the event.



Chemistry Department faculty enjoy the poster presentation at this year's Statewide EPSCoR Conference. Front row l. to r. Bob Dunn, Ted Kuwana, Cindy Larive, Rich Givens. Back row l. to r. Paul Hanson, Daryle Busch and Brian Laird

High-tech Hoch complex opens this fall

At the turn of the 20th century, students sat in one-room schoolhouses, and the slate board was the primary medium of instruction.

However, to today's generation of students raised on television, the chalkboard is not always the best way to convey information. When students walk into the new Budig Hall in the Hoch Auditoria complex, they will find themselves in the teaching environment of the 21st century—multimedia and multiscreens.

The academic complex which has a 2,000 student capacity, includes two lecture halls that can hold 500 students each, while the third auditorium can seat 1,000.

Each room has three rear-projection screens along the front wall, with each screen about 10 feet tall and 14 feet wide.

The design allows each screen to have a different image generated from a variety of sources. No matter what type of media—satellite links, Internet, video tape, laser disc, CD-ROM, slides—it can all run at once.

Once the images are programmed, the teacher can control everything from a console in the classroom. There's even a television camera in the classroom that can allow the teacher's image to be projected while the

teacher is instructing.

The complex includes a preparation room that offers tools for instructors to create their presentations. The system is set up to handle Mac- or PC-based programs.

A slow start is planned for this summer, with about 17 classes planned for the fall semester.— excerpts from an article appearing in *The OREAD*, Volume 21, Number 12, March 7, 1997.

Merck training grant awardees

Each year the Department awards three MERCK Undergraduate Fellowships for research to students in our analytical division. Recipients of these 1996 summer research awards:

Gregory A. Cooksey worked with research director Robert Dunn and graduate student Chad Talley on high resolution fluorescence imaging with cantilevered near-field fiber optic probes.

Joseph W. Robertson worked on the development of a complex manifold arrangement for automated pH and concentration studies for flow injection analysis. Joey studied with research director Ted Kuwana.

Jeffrey S. Timmons studied the synthesis and characterization of analogs of the beta-amyloid peptide involved in Alzheimer's disease. Cindy Larive was

his research director.

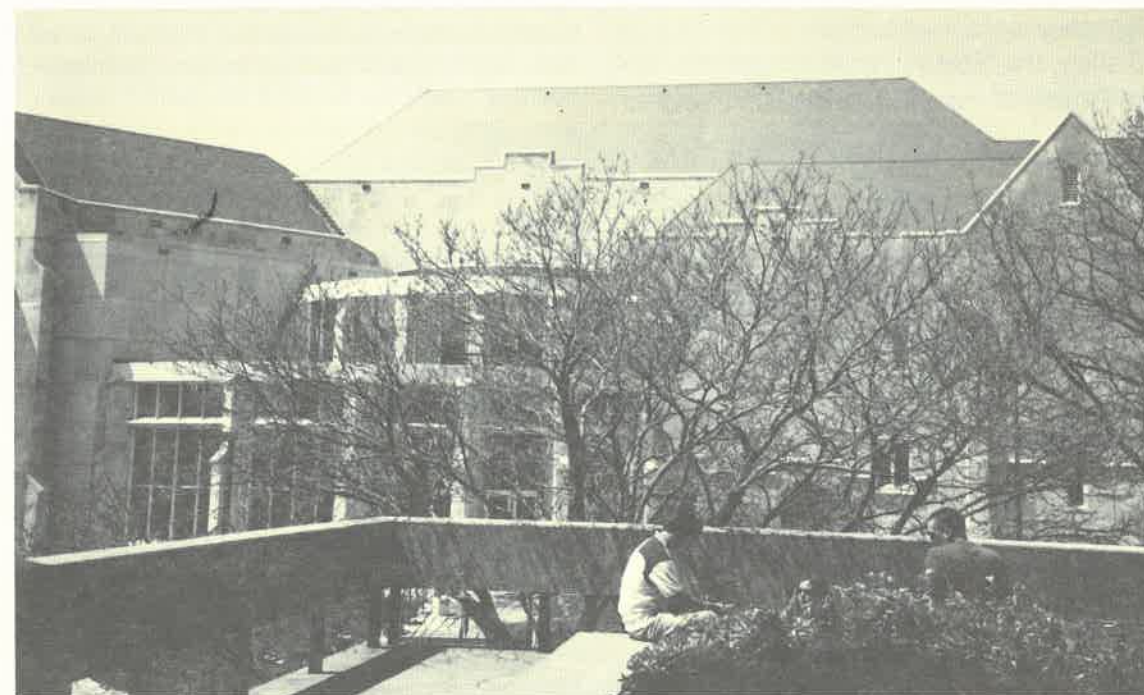
The 1997 Merck fellows were selected on May 5. Jack R. Lake and Greg A. Cooksey will spend this summer working under the direction of Bob Dunn.

2nd ACS Undergraduate Research Symposium

The University of Kansas local section of the American Chemical Society sponsored the Second Annual Undergraduate Research Symposium on April 26.

There were 25 participants from Central Missouri State University, Baker University, Benedictine College, Washburn University, Haskell Indian Nations University and KU. Undergraduate student researchers presented reports of their research results throughout the morning session. Outstanding Senior Awards in Chemistry were presented to Nannette Cardona (Benedictine College), Brena Sue Mauck (Washburn University), James Parmele (Baker University) and Joseph Robertson (KU).

After the lunch break, Richard Schowen, Summerfield Distinguished Professor of Chemistry and Biochemistry presented a lecture entitled *At the Interface of Chemistry and Biology*.



Looking at the new east entrance to Hoch Auditorium. View from the west Wescoe terrace.



During his tenure at the University of Kansas (1883-1933) and as chemist for the State Board of Health, E.H.S. Bailey never gave up his crusade to safeguard the public against impure and injurious foods and protect them from the frauds of mislabeling and misbranding.
(Photo courtesy University Archives)

Pure food and water for Kansans

E.H.S. Bailey, the State Food Laboratory, and the State Board of Health During the Progressive Era

[The following is a condensation of a more extensive article written for *Kansas History*, April 1997, by Carolyn Bailey Berneking—granddaughter of E.H.S. Bailey and a KU Archives volunteer.]

As long as food has been for sale, barter, or trade, some entrepreneurs have maximized their profits by making their products go a little further. Some of the first pure food laws were written because the public demanded something be done.

Water purity was also a problem. Unless private wells were dug, sources of drinking water were the nearest streams into which sewage and refuse had been dumped. Citizens were free to construct their own privies and drains. Livestock roamed the streets and disease was prevalent. The continual presence of pestilence and disease finally spurred a public health movement.

Scientific developments in the nineteenth century began to revolutionize the food industry. Advances in bacteriology and the invention of the achromatic microscope in the 1830s brought about the first labora-

tory testing of water and milk and initiated serious food analysis. The number of laboratories in medical schools, universities, health departments, and hospitals increased, and new scientific publications appeared. The American Chemical Society was founded in 1876, and the Association of Official Agricultural Chemists began in 1884. In January 1879 in an address to the Medical Society of the state of New York, Edward Robinson Squibb proposed a national statute to regulate food and drugs. A pharmacologist and pioneer in anesthesia, Squibb was an ardent advocate for national regulation of food and drugs. He convinced Senator Warner Miller of New York to introduce such a bill on December 20, 1881, to the Forty-seventh Congress of the United States, but it was defeated by a group of prosperous manufacturers of patent medicines who lobbied against the bill. Squibb died before he could see his dream come to fruition. Twenty-five years

later Congress passed the Federal Pure Food and Drug Act of 1906.

During these times of important advances in science and technology, Edgar Henry Summerfield Bailey was born on September 17, 1848, in the manufacturing village of Baileyville, near Middlefield, Connecticut. After he finished the district school, he attended the Wesleyan Academy in Wilbraham, Massachusetts, where he became especially interested in chemistry, physics, and geology. From Wesleyan he went to the Sheffield Scientific School at Yale University from which he received a bachelor's degree in 1873. He spent a year at Yale doing graduate study and teaching before assuming his first full-time teaching position at Lehigh University in Bethlehem, Pennsylvania, at an annual salary of one thousand dollars. Along with his teaching, Bailey performed commercial work analyzing iron, zinc, and manganese ores, coal, limestone, furnace gas, and other industrial products. He remained at Lehigh for seven years; those years provided him experience in making commercial chemical analyses and prepared him to teach mineralogy, metallurgy, and assaying.

In the latter half of the nineteenth century many American scientists traveled to Europe for more sophisticated research and training. It was estimated that at least 40 to 50 percent of the leading scientists of the United States born between 1850 and 1890 studied in Germany. In 1881 Bailey studied at the Kaiser Wilhelm University in Strasbourg, Germany, under Dr. Rudolph

Fittig, and in 1895 he went to Leipzig, Germany, for further study.

Bailey received the degree of doctor of philosophy from Illinois Wesleyan University in 1883, and in the fall of that year he became head of the University of Kansas chemistry department. He arrived when Lawrence was a town of board walkways, mud roads, and community drinking cups. Disease was widespread, impure food was common, and drinking waters often were polluted. During the next fifty years of teaching and research, he would help bring healthy food and safe drinking water to the people of Kansas.

Bailey was the only teacher in his department when he began and had no assistance other than what the more advanced students were able to give. He taught general chemistry, qualitative chemistry, quantitative chemistry, organic chemistry, assaying, mineralogy, metallurgy, blowpipe analysis, toxicology, physiological chemistry and *materia medica*. Two years later he added a course in domestic and sanitary chemistry. The University of Kansas thus became one of the first universities to offer a course in the practical application of chemical principles to every day life. This led to the establishment of the department of home economics and to Bailey's writing one of the first textbooks in the field in 1914: *The Source, Chemistry and Use of Food Products*.

The Kansas State Board of Health was formed in 1885, and Kansas pure food laws were passed in 1889, 1901, and 1905. These laws prohibited the manufacture or sale of adulterated foods but had little influence since no funds were available for enforcement.

However, on the national level things were

beginning to happen. Due largely to the leadership of one man, Harvey W. Wiley, pure food and drug legislation became a reality. Wiley was teaching chemistry at Purdue University when he took the job as head of the Division of Chemistry, United States Department of Agriculture, in Washington, D.C. The Federal Pure Food and Drug Act was signed by President Theodore Roosevelt on June 30, 1906. It became one of the most influential laws in the United States, with its enforcement assigned to the Bureau of Chemistry. The Meat Inspection Act was passed on March 4, 1907.

Like Bailey, many other Kansans were devoted to the progressivism of the early twentieth century. In 1904 the first full-time health official, Samuel J. Crumbine, was appointed. He had been a practicing physician in Dodge City and knew the dire results of unclean food and polluted waters. During his term as secretary of the Kansas State Board of Health the board passed two ordinances, one in 1909, eliminating all common drinking cups, and another in 1911, forbidding the use of roller towels on trains and in schools, restaurants, and hotels. These decisions helped slow the spread of all communicable diseases.

Crumbine's campaign against food contamination and adulteration started by establishing two state food laboratories: one at the Kansas State Agricultural College in Manhattan and the other at the University of Kansas chemistry department in Lawrence. Having no funds at his disposal, Crumbine used his own money to buy food samples to be analyzed. The reports of these analyses were published in the new bulletin of the state board, and thus the Kansas campaign for pure food and drugs began.

Bailey sent the first food analysis to the State Board of Health in January 1906. It reported that two-thirds of the food analyzed contained preservatives and adulterations. The report was copied widely by the press and caused a sensation throughout the state. In spite of the pressures from manufacturers and politicians, Governor Edward W. Hoch supported the State Board of Health, and the Kansas Pure Food and Drug Act was passed on February 14, 1907.

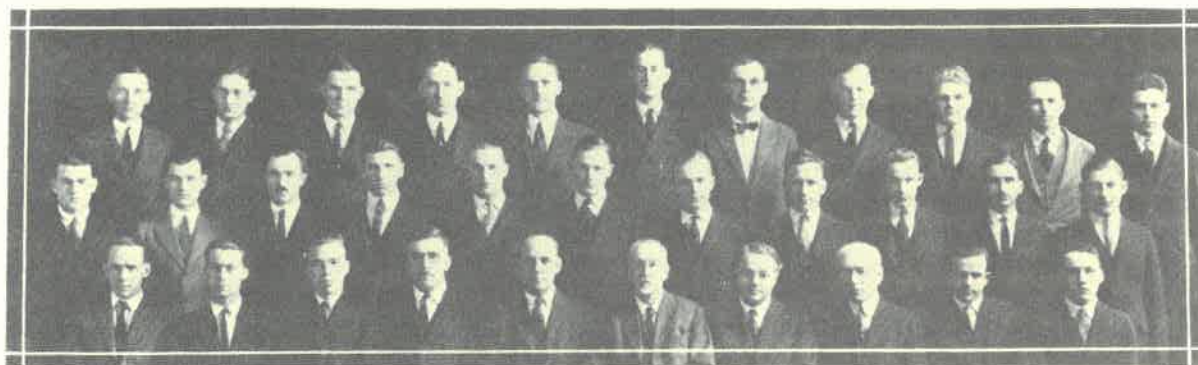
Enforcement of this law was placed in the



The class of 1892.
E.H.S. Bailey is standing at front center.
(Photo courtesy University Archives)

hands of the State Board of Health, which delegated the examination of foods and drugs to Julius T. Willard at the Kansas State Agricultural College in Manhattan and to Bailey at the University of Kansas chemical laboratory. The latter facility became known as the State Food Laboratory. Under the auspices of the state board, sectional meetings were held throughout the state for the purpose of educating everyone whose business related to the Kansas Pure Food and Drug Act. The committee chairing these meetings consisted of Bailey, Lucius E. Sayre of the pharmacy department at the University of Kansas, Willard, and Crumbine.

was made from rye flour or badly milled wheat flour that was only bought by the poor. Because bleached flour was white, it was thought to be pure. But instead of making the flour pure by bleaching with nitrous peroxide, this process made the flour so antiseptic that it resisted digestive juices. It therefore was unhealthy. As Bailey explained, the consumer now wants "nice white bread to set before her guests. It doesn't matter that this flour is usually bleached by chemicals, just as much as your straw hat is bleached by sulfur fumes, and your sheeting is bleached by chloride of lime in the bleachery."



Tann Unangst Filson Brewster Werner Cambern Taft Johnson Wise Moore Sharp
Gamble Havenhill Hetler Borngesser Saylor Weber Joss Moyer Moore Greene Morgan
Bronson Boyle Howe Barker Allen Bailey Cady Dains Eckel Oakleaf

The Kappa Chapter of Alpha Chi Sigma, 1924

Keeping food safe was not an easy task since manufacturers were trying to cut costs, often by slipping cheap substitutions into foods. Bailey's findings revealed many forms of adulteration. He found that copper had been added to canned vegetables to produce a natural-looking green color. A commercial sausage had a large amount of starch added to allow the use of more fat or water. Jam and jellies, made from treated cider mill refuse, proclaimed Bailey, "had their compositions so exposed that if they had not been already as red as aniline colors could make them, they would have blushed to acknowledge that no fruit whatever had been used in their manufacture." Lead chromate was put into lemon drops; burnt sienna, a mineral substance, was used to imitate chocolate; butter and cheese were colored to appear golden. Hoping this practice of coloring food to make it attractive would be eliminated, Bailey stated, "a dyed food like a made-up complexion will cease to be admired."

The State Food Laboratory also examined the purity of grains. Because bleaching flour could cover up many imperfections, Bailey suggested the public could avoid eating unwholesome or musty flour by using unbleached flour. The public's preference for white bread over dark bread originated when a cheaper bread

While many food impurities were harmless, some not only were harmful but deadly. One of the most widely adulterated foods was chocolate. Half of the chocolate for sale in Kansas contained not a grain of chocolate, but instead wheat flour, or potatoes, beans, rice, peas, egg yolks, almonds, and soap were substituted. This concoction was held together by tal- low, colored and flavored with methylated ether. And when red oxide of mercury was added, the product was actually poisonous. Even candy wrappers could be dangerous to children because of metallic dyes.

To make the public aware of these adulterations, Bailey began publishing pamphlets and writing articles for the newspapers. His pamphlet *Some Simple Kitchen Tests to Detect the Adulteration of Foods* was distributed throughout the state. Anyone could perform these simple tests, and the pamphlet was popular with housewives who kept it handy in the kitchen drawer. He wrote the *Sanitary Suggestions* columns for the *Topeka Daily Capital* about such topics as *What Water Shall We Drink?* and *The Art of Coloring Food*.

Convincing the manufacturer to list the product's exact ingredients was another problem for the State Food Laboratory. Bailey suggested that some products would be in little demand when the new law

mandated their contents be properly identified.

The sizes of cans and containers used for foods also was a concern handled by the State Food Laboratory. When a weights and measures law was passed in 1911, its enforcement was delegated to the State Board of Health.

In addition to his work to protect the public from fraud and impure food, Bailey was concerned about the state's water. The University of Kansas regents created a University Geological Survey in 1889 with Chancellor Francis H. Snow as *ex-officio* director and Bailey, Erasmus Haworth, and Samuel W. Williston as associates. The Kansas legislature of 1897 authorized the University Geological Survey to "make a complete geological survey of such portions of the state of Kan-

provement of the lives of Kansans. Bailey never abandoned his crusade to safeguard the public against impure and injurious foods and to protect them from the fraud of mislabeling and misbranding. He believed that good health could be maintained from knowledge gained through the chemist's experiments, and he devoted his life to sharing this knowledge with the public.

Second recruiting weekend is a success

From more than 300 graduate applications, 16 top students were invited to attend the Department's second Graduate Research Opportunities Symposium, which took place March 8-9, 1997.

Brian Laird, Dave Benson, Craig Lunte and Joe Heppert again coordinated an exceptional event which resulted in a successful recruiting effort—11 of those 16 students will attend KU this fall. In total the Department expects 18 students from two foreign countries and 13 states—including China, India, South Carolina, Kentucky, Minnesota, Ohio, Pennsylvania, Missouri, North Carolina, Iowa, New Jersey, Illinois, Kansas, South Dakota and Colorado. Four of the incoming students are past summer REU participants.

Weekend events included an overview of our program, graduate student poster sessions, divisional research presentations,

discussions of interdisciplinary research opportunities, and individual interviews with faculty. Those activities were interspersed with facilities and campus tours, along with luncheons, dinners and other social events.

This year several of our outstanding prospective students were invited to interview for Self Fellowships (see the following story), and two students entering the chemistry program this fall will be recipients of these prestigious awards.

It was a good recruiting year!

One of the most important tools in recruiting is our network of alumni contacts. If you know a graduate or undergraduate students interested in pursuing chemistry and who might be interested in attending KU, please contact : Brian Laird , TEL: (913) 864-4632 (area code changes to 785 on July 1) , EMAIL: blaird@caco3.chem.ukans.edu



The research symposium for prospective graduate students includes a dinner and poster session highlighting research underway in the Department.

sas as have any natural products of economic importance." Haworth headed mineralogy, Williston administered paleontology, and Bailey conducted the first research of the state waters. Thus the Kansas State Geological Survey was formed with headquarters at the University of Kansas, and the State Water Survey came under the jurisdiction of the University of Kansas chemical laboratory. Between 1898 and 1908 this trio of scientists wrote the University Geological Survey of Kansas. The nine-volume work included their explorations of Kansas' paleontological sites and its coal, gypsum, mineral waters, oil, gas, lead, and zinc deposits. Bailey's primary contribution to this survey was an analysis of the state's mineral waters.

During Bailey's tenure at the University of Kansas (1883-1933) and as chemist for the state board, chemistry contributed much to the development of the state's industrial resources. In addition, chemists such as E.H.S. Bailey also contributed directly to the im-

A fellowship that can change the world

Worth \$100,000 over four years, the Madison and Lila Self Fellowship seeks students with exemplary intellect and a gritty determination to leave a noteworthy legacy to the world.

A Self Fellowship candidate:

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- is a U.S. citizen

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Self Fellows enjoy such benefits as:

- intellectual engagement with KU's nationally



Students discussed the final course project results at the mock scientific conference. At center is Prof. Craig Lunte, Spring 1997, instructor for CHEM 636.

acclaimed graduate faculty

- professional development program
- access to the nation's top innovators and business leaders.

Students may be nominated by a college faculty member or apply directly to the program.

Call, write or access the Self Fellowship website, for more information:

The University of Kansas
Self Graduate Fellowship Program
222 Strong Hall
Lawrence, KS 66045
(913) 864-7249 (area code changes to 785 on July 1)
www.ukans.edu/~selfpro/

or contact the Chemistry Department

The University of Kansas
Chemistry Department
2010 Malott Hall
Lawrence, KS 66045
(913) 864-4670 (area code changes to 785 on July 1)
email: chemists@caco3.chem.ukans.edu

An experiment in problem-based learning

Comments like, "The experimental class opened my eyes to real life problem solving...we were challenged with more than what a regular 'follow the procedure lab' would have" and "I dig the format and think it is the class that I'll be taking with me into my first 'real job' interview...Bravo!" were the result of the Department's first experiment with a problem-based learning course format in analytical chemistry.

The idea for a problem-based format formed at an analytical chemistry faculty retreat last July when discussions began on the question, "How can undergraduate students be exposed to instrumentation and problem-solving within the context of an instrumental methods course?" said George Wilson, analytical division coordinator. In addition to Wilson, participants in the retreat included analytical chemists Ted Kuwana, Craig Lunte, Cindy Larive, and Bob Dunn.

With the addition this year of a differential scanning calorimeter, a spectrofluorometer and two Pentium computer workstations, the Department's newly remodeled, third floor Instructional Instru-

mentation Laboratory (IIL) had many of the modern, state-of-the-art tools needed to provide undergraduate students with a meaningful experience in analytical problem-solving.

So, this spring Craig Lunte took the experiment into the classroom. Ten students embarked on a team approach to problem solving in CHEM 636 *Instrumental Methods of Analysis*. At the start of the semester, students filled out employment applications for three corporations, completed job interviews, then were hired by one organization and given a problem to solve.

For this course, a team approach to task completion was used. Each team had weekly "staff meetings" with their manager—either Lunte or one of the graduate teaching assistants assigned to the course. The groups made periodic progress reports, both written and oral, to the managers. At the end of the semester, each group made a presentation of final results to "upper management"—a group comprised of analytical division faculty. The last assignment for the course was a poster presentation at a mock international scientific conference attended by all of the faculty, graduate students and postdocs in the analytical division.

Craig said students reported learning three things: 1) how to work in teams and allocate time, 2) the importance of good communication skills, and 3) how to apply what they had learned in the course to solve a problem. The experiment was a success!

Funds for equipment in the Instructional Instrumentation Laboratory were provided by KU's College of Liberal Arts and Sciences, the NSF-ILI Program, Hewlett Packard, Merck Sharp & Dohme, and Department faculty members Andy Borovik, David Benson and Cindy Larive.

KU has new research foundation beginning July 1

Robert E. Barnhill, vice provost for research at Arizona State University, Tempe, will become vice chancellor for research and public service at KU July 1.

As vice chancellor, Barnhill will coordinate all funded and nonfunded research activity on the Lawrence campus. He also will serve as president and chief operating officer for KU's newly organized Center for Research, Inc. (CRINC), a nonprofit foundation at KU designed to facilitate and increase research on the Lawrence campus.

Barnhill, 57, is no stranger to KU or to Kansas. A Lawrence native, he was the first National Merit Scholar from Lawrence High School to attend KU, where he earned a bachelor's degree with a major in mathematics and a minor in sociology in 1961. He completed master's and doctoral degrees in mathemat-

ics in 1962 and 1964 at the University of Wisconsin, Madison.

Dr. Barnhill comes to KU with an impressive list of accomplishments. "Much of what he will be doing at KU is similar to what he has so successfully achieved at Arizona State," Provost David E. Shulenberger said.



Barnhill joined Arizona State in 1986 as chair of the computer science department; he has served as the university's senior research officer since 1991. Before that, he was a professor of mathematics at the University of Utah, Salt Lake City.

During his tenure at Arizona State, research funding from external sources grew steadily.

From fiscal years 1992 through 1996, total sponsored projects increased an average of 18 percent annually to \$84.5 million in 1996.

Barnhill also has been an active researcher for most of his academic career. He helped attract more than \$4.5 million in grants for his work at Arizona State.

Barnhill joins KU just as CRINC is completing a major reorganization and change in mission. The center, which previously managed research activities primarily for the School of Engineering, will administer all externally funded research on the Lawrence campus beginning July 1.

CRINC will help focus resources from external sources on KU's research mission and provide a range of services for researchers, including assistance in proposal development, contract negotiations and financial management, Shulenberger said. It also will help with seed capital for research development and technology-transfer activities.

The new CRINC is part of what attracted Barnhill to KU. He said that an "agile organization" such as CRINC would be an important asset to KU faculty members as they face increasing competition from other researchers for limited government and private funding.

"The research dollars available today are for problem-oriented research, not department-oriented," he said.

"You need an agile organization that responds quickly to grant opportunities and can pull together researchers from different disciplines for a particular project."

As Barnhill envisions it, the Office of Research and Public Service will foster and encourage research and creativity among researchers and academic departments. CRINC will serve as "the tool" through which KU faculty can respond quickly to new research

The Chemistry/Physics Computing Resource Room Comes On-Line

During the past year, the Chemistry and Physics Departments were able to come together, supported by the College and the Instrumentation Design Laboratory, to create a joint computing facility in Malott Hall, the Chemistry/Physics Computing Resource Room (CPCRR).

The project began when the College (CLAS) offered funds to each department for undergraduate computing. Physics was ready to purchase 9 Pentium multimedia computers, and Chemistry acquired funds for 14. Space, always at a premium in Malott, was nowhere to be found, until Physics volunteered to share a room that had been used for storage.

With space and computers available, the Instrumentation Design Laboratory set out to plan and develop the facility, and the room came on line in the fall of '96. CLAS provided for two TA positions for the spring semester to supervise the room.

In the absence of any provision for continuing support staff, a system for "stand-alone" operation was needed. The installation of Windows95 is notoriously easy to corrupt if not carefully protected. The Instrumentation Design Lab developed software for maintaining the installation, remote and web-based usage monitoring, and metering printing.

Currently the CPCRR has 23 Pentium computers with Windows95 linked to the building Novell server and to the Internet. Networked LaserJet and DeskJet printers are available. Among the software packages available to the students are Microsoft Office, MathCad, Origin, Alchemy, ChemiCalc, ChemWindow, LabView, Pspice, tutorials and other software for NMR processing, instrument simulation, and curve-fitting.

For more information about the CPCRR, point your browser to:

<http://www.chem.ukans.edu/cpcrr>.

Endowed Lectures

48th Annual Frank Burnett Dains Memorial Lecture, Paul A. Wender, Stanford University: *The Chemistry-Medicine Continuum: Synthetic Computer and Biological Studies on New Chemotherapeutic Leads*.

Tenth Annual Ray Q. Brewster Memorial Lecture, Daniel G. Nocera, Michigan State University: *Optical Supramolecules: Sensors for Planes, Trains and Automobiles*.

The Arthur William Davidson Lecture, Robert J. Silbey, Massachusetts Institute of Technology: *Molecular Spectroscopy in Low Temperature Systems*.

The 32nd Annual Werner Lecture, Edward S. Yeung, Iowa State University of Science and Technology: *Pharmacokinetics at the Level of a Single Cell Revealed by Capillary Electrophoresis and Deep UV-Microscopy*.



Faculty and staff enjoyed the grand opening of the new Computing Resource Center this fall.



Good-bye to Orlena! Orlena Carr and her husband Rodney prepare to do the Jayhawk in. After working in the Business Office and Chemical Storeroom for seventeen years, Orlena has decided to become a Missouri Tiger. She and her husband are moving to Eldon, Missouri. Her smile and laugh will be missed!

The class of 1997

This year the Chemistry Department graduated twenty-six students—fourteen received bachelor's of arts and eleven received bachelor's of science degrees, with several receiving recognition for their academic accomplishments. Two students completed the CLAS Honors program, two graduated with highest distinction, six with distinction and four were Phi Beta Kappa. One student was a Summerfield Scholar and one graduating senior received a University award for exceptional character and potential for community service—the Class of 1913 Award.

A complete list of student names and awards received appears on page 25, Other Awards.

Chemistry graduate students will study abroad

Two chemistry students were included among twelve KU students receiving grants to study abroad for the 1997-98 academic year.

Greg Harms, a doctoral student in Carey K. Johnson's physical chemistry group was awarded both a Fulbright and a KU Graduate Direct Exchange Scholarship. Greg will study at ETH in Zurich, Switzerland.

Tina Huang will study in Potsdam, Germany. Tina, a doctoral student in Ted Kuwana's analytical chemistry group, was awarded a German Academic Exchange Service Scholarship (DAAD).

42nd honors reception

For the second year, the Department's annual awards presentation and honors reception was held in May at the Adams Alumni Center.

We were extremely fortunate this year to have KU alums Lisa McElwee-White (B.S., 1979, chemistry) and James H. White (B.A., 1979, radiation biophysics) as guest speakers. Lisa completed her doctorate at the California Institute of Technology and is currently an associate professor at the University of Florida—Gainesville, where her research interests include the mechanisms of organometallic reactions, applications of organometallic compounds in synthesis, materials science,

and electrocatalysis. James completed a doctorate at the Molecular Biology Institute at UCLA. In 1993, he founded Predation, Inc., in Florida where he is currently developing biological insecticide products.

Lisa and Jim met while at KU and faced the trials and tribulations of starting "dual couple" careers. They provided some very informative and often humorous insight on career decision making for two. While apparently the road is not an easy one, the couple now happily reside in Florida with their two children and both Jim and Lisa have achieved success in their chosen fields.

The Ernest and Marvel Griswold Award was presented for the first time at this year's reception. The honor of receiving the first Griswold award went to two outstanding, advanced graduate students in inorganic chemistry.

Chester E. "Ernest" Griswold received his Ph.D. from KU in 1934 under the direction of Arthur Davidson and join the faculty in 1947. The Ernest and Marvel Griswold Award was established at the KU Endowment Association by their children to honor their parent's memory.

A complete list of student names and awards received appears on page 25, Other Awards.

42nd Chemistry Honors Reception Honors to 1996-97 Students

Undergraduate Student Awards

The W. Mack Barlow Book Awards

General Chemistry *Lawrence M. Gibbs, Victoria Ke, & Matthew J. Moll*

Organic Chemistry *Dawn Wormington*

One semester course *Travis Lee Koenek, Kortnee B. Lanning & Larissa J. Lee*

Two semester course *Matthew K. Zart*

Analytical Chemistry *Paul Tittel*

Physical Chemistry *Anthony P. Khalifah*

One semester course *Krista E. Tiller*

Two semester course *Matthew C. Haug, Randy L. Russell & Lee R. Schnee*

Snyder Award *Sigrid C. Hubbell*

Owen W. Maloney Scholarship *Kristine A. Kuhn*

Fassnacht Scholarship *Catherine L. Cronin*

Leonard V. Sorg Scholarship *Farnaz Farokhi*

Clark E. Bricker Scholarship *Matthew Zart*

Jacob Kleinberg Award

American Institute of Chemists Award

Alpha Chi Sigma Award

Chemistry *Drew Manica*

Chemical Engineering *Jason N. Voogt*

Reynold T. Iwamoto Award *Jaelyn L. Ganacias*

Graduate Student Awards

H.P. Cady Award *Jeff B. Botts*

Outstanding First-Year Teaching Assistant *Douglas F. Holub*

Ray Q. Brewster Award *Cynthia M. Scheibe & David J. Weiss*

Paul & Helen Gilles Award in Physical Chemistry *Scott D. Bembenek*

Higuchi Doctoral Progress Award *Kandiah Anandarajah*

J.K. Lee Award *Xi Chu & Tim J. Hubin*

Phillips Summer Research Fellowship *Christopher W. Hollars & Yan Wang*

Ernest and Marvel Griswold Award *Anne K. McCasland & Anjal Sharma*

Graduate Degrees Granted

June 1, 1996—June 30, 1997

Doctorate

Timothy Baroni **Mentor: J. Heppert**

Dissertation: *High oxidation state tungsten phenoxides with ortho-chelating groups.* Baroni is a post doc with Borovik's group.

Maria Buchalova (honors) **Mentor: D. Busch**

Dissertation: *Thermodynamics and kinetics of carbon monoxide and dioxygen binding to iron(II) cyclidene complexes.* Maria is a post doc with Busch's group.

Joseph Cavaleri **Mentor: R. Bowman**

Dissertation: *Ultrafast studies of semiconductor and molecular systems.* J.J. is a postdoc with Dana Dlott at the University of Illinois.

Nikolay Gerasimchuk **Mentor: K. Bowman-James**

Dissertation: *Synthesis, spectroscopic and structural studies of a new family dipyrromethane ligands and of their manganese complexes as catalase models.* Nick is a post doc at North Dakota.

Olga Gerasimchuk **Mentor: K. Bowman-James**

Dissertation: *Anion recognition by polyazamacrocycles and selected metal complexes.*

Mike Hadwiger **Mentor: C. Lunte**

Dissertation: *Development of total microdialysis sampling systems: Analytical and sampling considerations for quantitative microdialysis.* Mike is at Sigma in St. Louis.

Alexander Kolchinskii **Mentor: D. Busch**

Dissertation: *Receptor-receptee interactions in supramolecular chemistry.* Sasha will be a postdoc at MIT.

Karina Kwok **Mentor: G.S. Wilson**

Dissertation: *Study of antibody antigen interactions: The importance of peptide antigen conformation.* Karina is at Procter and Gamble.

Xiaozhong Liang **Mentor: C. E. Lunte**

Dissertation: *The study of antitumor agents using microdialysis sampling.* Liang is at Bristol Myers Squibb.

Andrew Vance **Mentor: D. Busch**

Dissertation: *Transition metal complexes of Schiff base ligands: A new family of molecular templates.*

Yeping Zhao **Mentor: C. E. Lunte**

Dissertation: *Analysis of pharmaceutical compounds in physiological fluids by microdialysis sampling and capillary electrophoresis.* Yeping is a postdoc at the University of California—San Francisco.

Min Zhong **Mentor: S. Lunte**

Dissertation: *Development and characterization of electrochemical detectors (EC) for capillary electrophoresis (CE) and miniaturization of CEEC analysis system.* Zhong is a post doc in Sue Lunte's group.

Master's

Galina Goloverda **Mentor: J. Heppert**

Dissertation: *Search for the new catalytic systems for the asymmetric Diels-Alder reactions.* Galina and her husband, Vladimir Kolesnichenko, are at the University of Iowa.

Jiayang Fu **Mentor: D. Benson**

Dissertation: *Exciplex fluorescence in inclusion complexes of naphthalene derivatives.*

Steve Meduna **Mentor: T. Engler**

Dissertation: *Lewis acid-promoted reactions of styrenyl systems and benzoquinone bisimides: New regioselective synthesis of substituted 2-Aryl-2, 3-dihydroindoles and 2-arylindoles.* Steve is at IDUN Pharmaceuticals, San Diego.

Jue Tan **Mentor: B. Schowen**

Dissertation: *Organic solvent effects, activation parameters, and proton inventory studies of a alpha-chymotrypsin-catalyzed ester hydrolyses.* Jue is pursuing her doctoral studies at Lehigh University, Bethlehem, Pennsylvania.

Bing Wang **Mentor: R. Schowen**

Dissertation: *Enzyme structure, substrate structure and the number of protons in serine protease catalysis.* Wang is pursuing a doctoral degree in pharmacy at the University of Nebraska.

Other Awards

Greg S. Harms *1997-98, ETH Zurich, Switzerland, Fulbright & KU Graduate Direct Exchange Scholarship*

Tina Huang *1997-98, Potsdam, Germany, German Academic Exchange Service Scholarship (DAAD)*

Erica Larson *1997-98 Graduate School Dissertation Fellowship*

Jeff S. Botts *1997 Graduate School Summer Fellowship*

Shawn Mansfield *Finalist, Graduate School Outstanding GTA*

Greg Cooksey *Barry M. Goldwater Scholarship*

William Freund, Phu Tan Huynh & Jack Lake *KU Undergraduate Summer Research Awards*

Danette Hansen *Sigma Xi Competition Awardee—Post Oral*

Drew Manica *Sigma Xi Competition Awardee—Undergraduate*

Matthew Zart & Jeffrey Hesse *With Highest Distinction*

Christopher McCullough, James Daniels, Synthia Chang, *With Distinction*

Apostolos Evangelidis, Caroline McNaughton, & Drew Manica *Class of 1913 Award*

Apostolos Evangelidis *KU ACS Section Outstanding Senior in Chemistry*

Joseph Robertson *CLAS Honors*

Matthew Zart & Jeffrey Daniels

Sandra Rogers Barnes, Sheila Rogers Dixon, *KU Black Faculty and Staff Council, Scholars*

Tiffany Derrick & Misty Spann

Jeffrey Daniels, Apostolos Evangelidis, Caroline McNaughton, *Phi Beta Kappa*

Jeffrey Hesse & Matthew Zart

Alumni news

In alphabetical order

Alicia Arbaje (B.A., 1995) currently a second-year medical student at Yale, was a Rhodes Scholar finalist in 1996. Alicia was also a finalist in the 1994 competition.

Phillip Athey (Ph.D., 1990) presented his research on the synthesis of cyclen (1,4,7,10-tetraazacyclododecane) at the XXI International Symposium on Macrocyclic Chemistry in Montecatini Terme, Italy, last summer. He is continuing his research in the area of chelants at the Dow Chemical Co.

Whitney Baker (B.A., 1994) is a graduate student in preservation and conservation studies at the University of Texas—Austin's School of Library and Information Science.

Jeff Barnes (M.S., 1996) has been promoted to group leader. He, his wife and son reside in Kansas City.

Ralph Birdwhistell (Ph.D., 1953) received his Ph.D. then went to Michigan State University and Butler University before arriving at the University of West Florida, where he retired last June. On Ralph's 70th birthday there was a surprise symposium of former students followed by a dinner at which a \$50,000 scholarship fund was announced in his name. He continues to work as much or as little as he desires and is particularly interested in bringing the advanced labs up to date, stressing new techniques and working in small quantities.

Kimberly Bland (B.A., 1995) is a second year graduate student in molecular and cell biology at the University of California—Berkeley.

Jennifer (Tiller) Burgoyne (B.A., 1990) and **Thomas Burgoyne (B.A., 1990)** Jennifer is currently an ophthalmology resident at Indiana University Medical Center. Thomas received a doctorate in chemistry from Indiana University in 1996. They have a 2-1/2 year old daughter, Cara, and are expecting twins in May.

Morris Chang (B.A., 1988; M.D., 1992) is chief resident in the neurology section of the Dartmouth-Hitchcock Medical Center and a faculty member at the Dartmouth Medical School. In July, Morris will begin a fellowship in radiation neuro-oncology and stereotactic radiosurgery at Mallinckrodt Institute of Radiology at the Washington University Medical Center in St. Louis.

Marcus Chao (Ph.D., 1977) is chief representative and managing director of the General Motors Corporation, Delphi Automotive Systems' Shanghai Office in the Peoples' Republic of China.

Dong Joon Choo (Ph.D., 1988) is currently professor of chemistry at Kyung Hee University in Seoul, South Korea.

Greg Cronin (B.A., 1989) received a doctorate in marine sciences from the University of North Carolina—Chapel Hill in 1994. From 1995-97 he was a postdoctoral research associate and an assistant professor at the University of Notre Dame. Beginning in June, Greg will be a CIRES Fellow at the University of Colorado (Cooperative Institute of Research in Environmental Science). He and wife Julie have a son Cody, 2, and a daughter Katy, 10 months.

Malonne Davies (Ph.D., 1996) is a senior scientist with Bioanalytical Systems of West Lafayette, Indiana, and has laboratory space on West Campus.

Binodh Desilva (Ph.D., 1994) continues as a scientist with P&G Pharmaceuticals in Norwich, New York. Binodh is currently principal analytical investigator for two non-clinical and clinical studies, conducting method development work and validation of LC/MS/MS and immunoassay methods and using these methods to analyze study samples. She also coordinates efforts at contract facilities and acts as bioanalytical liaison to the clinical pharmacokinetic/pharmacodynamic group in Cincinnati.

Michael D. Grimes (B.A., 1990; M.D., 1994) is chief resident at St. Joseph Family Practice, graduating in June 1997. He and wife Deborah have two daughters Lauren, 3, and Meghan, 6 months.

David R. Hardten (B.S., 1983, M.D., 1987) is a physician with Lindstrom, Samuelson and Hardten in Minneapolis, Minnesota.

Ervin Hiebert (M.A., 1943) received a doctorate in physical chemistry and the history of science at the University of Wisconsin—Madison in 1954, where he continued as a professor until 1970. Hiebert was a professor of the history of science at Harvard Univer-



Howard Hendrickson (M.S., 1992) and Tina (Anderson) Hendrickson (Ph.D., 1993) with daughter Kaitlin, 2-1/2, and son Alex, just one month old. Howard is an assistant professor at the University of Southern Illinois at Edwardsville, while Tina telecommutes to work at ImmunoVision, Fayetteville, Arkansas.

Thank-you for supporting the Chemistry Department!

May 30, 1996 — June 1, 1997

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Robert C. Williams
Keith D. Wilner
Michael Tood Wingard
Wayne C. Wolsey
Jin Sun Yoo
John F. Zimmerman

sity from 1970 until his retirement in 1989.

John Hogg (Ph.D., 1974) presented an address at the KU's first annual Professional Development Conference on Pedagogy: The Science and Art of Teaching. This conference is sponsored by the School of Business as part of the J.A. Vickers Sr., and Robert S. Vickers Sr., Memorial Lecture Series. Hogg, a professor of chemistry at Texas A&M, spoke on pedagogy in the sciences.

Frederick H. Horne (Ph.D., 1962) and Clara J. Horne (B.A., History, 1959) are dean of science and head advisor for the college of business, respectively, at Oregon State University, Corvallis. Fred and Clara were honored and surprised last fall when the faculty of Oregon State established a scholarship fund in their names for Women in Science.

Perry J. Johnson (B.A., 1986) After completing his medical degree in 1990 at the KU Medical Center, Perry completed an otolaryngology residency at the University of Nebraska Medical Center. He is currently in his final year of a two year plastic and reconstructive surgery residency at the University of Pittsburgh Medical Center. He married Ann Schaeffer (J '86) in 1988. They have two daughters Taylor, 5, and Kaitlin, 3.



Galina Goloverda (M.S., 1996) and Vlad Kolesnichenko (M.S., 1995) stopped by the Department while in town for the wedding of graduate students Sue Nelson and Mark Mason. Vlad and Galina are currently at the University of Iowa.

Leo Kim (Ph.D., 1967) As executive vice-president and chief technical officer at Mycogen Corporation, San Diego, California, Leo directs all of Mycogen's biopesticide and plant science research programs and has management responsibility for the company's information systems, facilities and regulatory affairs.

Mycogen is a diversified biotechnology company that develops and markets environmentally com-

patible biopesticides and planting seeds for improved crop varieties to control pests and increase food and fiber production.

Before joining Mycogen in 1986, Kim spent 18 years in the chemical pesticide industry with Shell Oil Company, culminating with his appointment as principal scientist for Shell Development Company. In that position, he was responsible for coordinating biotechnology projects and developing novel approaches to agricultural chemicals. Previously, as research and development director, he cofounded Shell's efforts in pharmaceutical biotechnology. In addition to being the company's senior technology planner and manager, Kim served as liaison with Japanese companies.

Kim holds a B.S. degree in chemistry from Fresno State College and a doctorate in organic chemistry from KU, and did postdoctoral studies in penicillin analogues at MIT. He has lectured extensively throughout the U.S. and in Japan on the development of biological pesticides, has received dozens of patents and has published numerous technical papers.

Kara Kitchen (B.A., 1996) has been employed at Oread Laboratories, Inc. since completion of her degree in August. She joined two other former photochemistry group members **Billy Hudson (B.A., 1994)** and **John Lord (B.A., 1994)**.

Xiao Zhong Liang (Ph.D., 1996) works as a research scientist at General Electric Co., Mount Vernon, New York.

Robert Malott (B.A., 1948) *The following article appeared in the Lawrence Journal-World, April 2, 1997.*

Robert Malott, a former Lawrence resident, hitched a ride Monday on the plane that will try to recreate Amelia Earhart's ill-fated 1937 attempt to fly around the world at the equator.

Malott, 70, who is on the board of directors of United Technology, was the lone passenger in the plane Monday on the first leg of the flight, from Miami to San Juan, Puerto Rico, Malott's secretary confirmed.

United Technology, through its subsidiary, Pratt & Whitney, is providing two engines to power the Lockheed Electra 10 E piloted by Linda Finch, a Texas businesswoman.

Malott who lives in the Chicago area, is chairman of the executive committee form FMC Corp. He is the son of the late Dean Malott, a former Kansas University chancellor.

Finch is trying to trace the path outlined by Earhart in her 1937 attempt. Earhart fell about 2,000 miles short of her goal, disappearing near Howland Island, a tiny atoll in the western Pacific Ocean.

Kenneth L. Marsi (Ph.D., 1955) celebrated his past achievements and accomplishments at a reception last September in the Earl Burns Miller Japanese Garden at California State University—Long Beach. A named endowed scholarship was established

in his honor. The reception was hosted by the department of chemistry and biochemistry, where Marsi has served as department chair for 21 years.

Dorothy (Kelly) May (B.A., 1964; Ph.D., 1970) is professor of biology at Park College, Parkville, Missouri.

Sandra L. Mecklenburg (B.S., 1985) is now on the technical staff at Los Alamos National Laboratory. She was a Director's Fellow at Los Alamos for the two years prior to being named to the permanent staff.

Alayna M. Miller (B.S., 1996) is currently a chemist at EPIC Laboratories, Inc., in Lewisville, Texas.

James C. Mordy (B.A., 1947) The law firm of Morrison and Hecker L.L.P. announced that Mordy has been named a Fellow in the American College of Bankruptcy. He is one of 23 attorneys and seven judges from around the country who have been inducted into the college's seventh class of fellows in Washington, D.C.

Being recognized as a Fellow placed Mordy among a select group of attorneys, judges, turnaround specialists and CPAs. These professionals must practice in some field of bankruptcy for 15 years or longer before they can be considered for fellowship. The total number of Fellows in the country is less than 300. Five other attorneys in Missouri and two attorneys in Kansas have received this honor.

Mordy is one of 10 attorneys in the four-state region of Kansas, Missouri, Nebraska and Iowa who hold national board certification in Business Bankruptcy Law from the American Bankruptcy Board of Certification. He is the only one of those in metropolitan Kansas who has been included in all six editions of *The Best Lawyers in American* in the fields of debtor, creditor and bankruptcy law.

He is a member of both the Kansas and Missouri bars. —*Excerpts from the Leawood Outlook, May 28, 1996.*

Roger A. Munsinger (B.A., 1970) is senior product manager at Brinkmann Instrument in Westbury, New York.

Robert L. Myers (B.S., 1959) completed a Ph.D. degree at Iowa State in 1963. He took early retirement in August 1996 from his position as chair of the department of chemistry at the West Virginia Institute of Technology. Robert will continue to reside at his home in Fayetteville, West Virginia.

Charles Neywick (Ph.D., 1974) is polymers technical manager at Hampshire Chemical Corporation, Lexington, Massachusetts.

Franklin Okumu (REU, 1990) completed his Ph.D. with Ron Borchardt (KU pharmaceutical chemistry) and is now working at Aradigm Corporation in Hayward, California.

Sangryoul Park (Ph.D., 1996) is a postdoc at the University of Utah in Salt Lake City.

Keith E. Parker (B.A., 1961) retired from



Binodh Desilva (Ph.D., 1994) came to Lawrence for March Madness.

Marion Merrell Dow (now Hoechst Marion Roussel) in July, 1993 after 28 years as a pharmaceutical engineer. Duties were production manager and senior process engineer. Keith currently works with Apex Associates, Kansas City, Missouri, as a consultant to FDA regulated industries. He is also enjoying extensive travel.

Frank D. Popp (Ph.D. 1957) retired in January 1995 as professor of chemistry at UMKC. He currently lives in Gaithersburg, Maryland, where he has a part-time, temporary position at ACS headquarters in Washington helping to set up Project Instrumentshare.

Daniel C. Ricke (B.A., 1996) is a student at Northwestern University Dental School.

Harold C. Riddle (B.S., 1995) is a forensic scientist with the Kansas Bureau of Investigation. He married Selina Marie Martin in April 1996.

George G. Robinson II (B.A., 1989) received his M.D. from Vanderbilt University and is currently an orthopedic surgery resident at the Kansas University Medical Center. His wife Sara received a bachelor of science in nursing in 1992.

Iffaaaz Salahudeen (Ph.D., 1995) and wife Ferial have a new daughter, Amani, born March 26, 1997. Iffaaaz is currently a postdoc working on a joint project with Drs. Borchardt, Chong and Stobaugh in pharmaceutical chemistry.

Michael J. Schmidt (B.A., 1976, M.D., 1979) is a physician with Orthopedic Clinic and Sports Medicine in Topeka, Kansas. The group of five physicians recently expanded their practice by opening a satellite office and adding a new partner.

Ronald L. Simmons (B.A., 1952) is senior technology specialist for the U.S. Navy in Indian Head, Maryland. Simmons presented papers at the Fraunhofer Institute on Energetics Materials in Karlsruhe, Germany, in June 1996 and at the Interna-

tional Combustion Conference—100 years After Alfred Nobel—in Stockholm, Sweden, in May 1996.

Rominder Singh (Ph.D., 1991), his wife, Anita, and son, Roman, recently moved from Raleigh/Durham, North Carolina to West Point, Pennsylvania. Romi had worked for Glaxo Wellcome (formerly Burroughs Wellcome) at Research Triangle, North Carolina, for over four years before moving to Merck, Inc., in West Point.

Karl E. Spear (Ph.D., 1967) received the Solid State Science and Technology Award at the 191st Meeting of the Electrochemical Society, Inc., Montreal, Quebec, Canada, on May 6, 1997. One of the Society's most prestigious Awards, the Solid State Science and Technology Award honors an individual who has made distinguished contributions to the field. Spear's award address was entitled *High Temperature Chemistry: A Key to Solid State Science and Technology*. Karl is currently a professor of ceramic science in the department of materials science and engineering at Pennsylvania State University.

Julie Stenken (Ph.D. 1996) is an assistant professor in the department of chemistry at Rensselaer Polytechnic Institute in Troy, New York.

J. Dale Taliaferro (Ph.D., 1963) The Montana Public Health Association presented its most prestigious award—The Mary E. Soules Distinguished Service Award—to Dale at its annual statewide conference held in Great Falls. This award is reserved for those who provide outstanding contributions to public health. Dale dedicated 16 years of his public career with the state to the improvement of public health services, culmination in the creation of task force that developed the Montana Public Health Plan. Dale retired in May, 1996, and currently resides in Helena with his wife Lenore. Their daughter, Sara, is pursuing graduate studies in botany at KU, and his son Brad is pursuing ministerial studies and resides with his family in Rosendale.

Jue Tan (M.S., 1996) is pursuing her doctoral studies at Lehigh University, Bethlehem, Pennsylvania.

Duane E. Thurman (Ph.D., 1967) is president of Dentrex Consulting, Inc. in Berwyn, Pennsylvania. Dentrex specializes in optimizing strategic assets: technology, markets, people, processes and strategy.

Kunisi (Venkat) Venkatasubban (Ph.D., 1975) is currently at the University of North Florida—Gainesville, where he was recently reelected to a second, three-year term as chair. Venkat has received two TIP awards (Teacher Incentive Program) from the state for outstanding teaching. He reports that daughter Sharmila is at Carnegie Mellon and majoring in English. Venkat's son Satish, an eighth grader, plans a career in computer science and daughter Sara is a medical technologist, working in a state lab.

Tim Webb (B.S. 1988) After leaving Ricon

Resins in Colorado, Tim and his father have established a research facility—T.W. Research—in Rogers, Arkansas. They have a patent pending for a novel oxidation that is useful in the polymer industry.

Pamela Croyle Weinhold (B.A., 1988; M.D., 1992) is currently an internal medicine physician with the Central Oklahoma Medical Group in Oklahoma City. Pamela and husband Frank (KU pharmacy graduate) have one son, age 2.

Deborah Wilkerson (B.S., 1973) is senior research chemist with Eastman Chemical Co. in Kingsport, Tennessee. Deborah is currently team leader of fiber piloting and testing operations and is a member of the Board of Examiners for the Tennessee Quality Award.

Robert G. Williams (B.A., 1978 Chemistry; B.S., 1985 Engineering) is at Williams Engineering and Industrial Hygiene, Inc., in Carbondale, Kansas.

Jason B. Wittmer (B.A., 1993; M.D., 1997) is beginning residency in internal medicine and pediatrics at the University of Kansas Medical Center in June 1997.

Deborah (Brown) Woodard (B.A., 1992) completed an M.D. at Baylor College of Medicine and is a resident physician in OB/GYN at Wesley Hospital.

Fang Zhao (B.A., 1993, M.S./Ph.D., 1996, pharmaceutical chemistry) is currently a research investigator with Bristol-Myers Squibb Co.

Willie Zimberoff (B.S., 1992) was promoted to executive baker and head of cereal chemistry for the Corner Bakery. Currently, he has relocated to Washington, D.C. to open a Maggiano's Little Italy Restaurant and Corner Bakery as the concept is going nationwide.

In Memoriam

John B. Campbell (B.S., 1947) died in December 1993.

Robert W. Taft, Jr., (B.S., 1944; M.S., 1946) died February 9, 1996. In recognition of his outstanding contributions to the scientific community as well as to the University of California—Irvine a memorial lectureship has been established in his name. The lectureship is not limited to any particular field of chemistry since Professor Taft's contributions touch nearly all areas of the science. Taft is the son of Robert W. Taft, Sr., professor of chemistry at the University of Kansas for many years.

Raymond F. Tietz (Ph.D., 1954) died July 15, 1996.

KEEP IN TOUCH!

We want to know how you're doing.....

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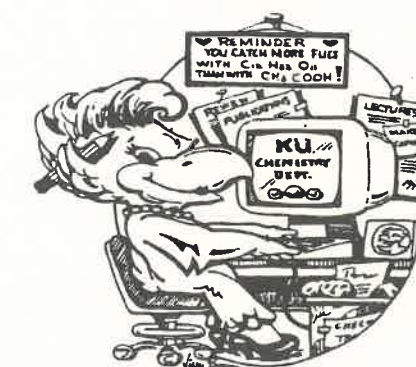
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