



Celebrating 125 Years of Great Chemistry — Historical Perspectives (PART 2)

BY MARK A. GRIEP



Analytical Laboratory in the Chemical Laboratory in 1892 Student Yearbook

The University of Nebraska's chemistry department began in July 1882 when Hudson Henry Nicholson arrived to take his position as chair of the newly created chemistry and physics department. Part two covers the fourth and fifth years of the Department (1886-1887 and 1887-1888).

To handle the rapidly expanding student enrollment and faculty, Chancellor Manatt and the regents requested \$75,000 from the 1884 Nebraska Legislature to build two more buildings, the Chemical Laboratory and the Industrial College. Despite the University's success and the booming economy, the Legislature appropriated only \$25,000. Nicholson convinced everyone to build the Chemical Laboratory by saying he would start a sugar beet research program to create new jobs for the state.

Nicholson helped the architects design "facilities for chemical work not to be excelled by any college in the country." During

the summer of 1885, he traveled to the Colorado School of Mines and the Chemistry Laboratories in Berlin and Heidelberg to learn about the best facilities. Upon his return, he listed Berlin and Heidelberg among his credentials. He moved into his new building in Fall 1886. The chemistry and physics departments were split in 1887 when DeWitt Brace was hired as chair of physics. His article on the transparency of luminiferous ether was one of several articles that Albert Einstein cited as support for his theory of special relativity. By 1887, Nicholson had received so many requests for information about the new building that he wrote a three-page letter titled "Chemical Laboratory of the University of Nebraska" to *Science* (vol. 11, no. 236, pp. 82-84) that included floor plans. The Nebraska Chemistry Department had arrived on the national scene.

To begin his research program on sugar beet culture, Nicholson contacted the U.S. Department of Agriculture. They sent information and encouragement because the

government wanted to reduce its dependence on imported sugar. Nicholson realized he needed a knowledgeable colleague to carry out his plan. He had met the very capable Rachel Lloyd four years earlier when he took Mabery's Summer Short Course in Chemistry at Harvard University. When he offered her the position, she accepted immediately.

Rachel Abbie Holloway grew up on a family farm in Flushing, Ohio. At age 20, she married Franklin Lloyd from Philadelphia. He was a chemist at the Powers and Weightman Company. During the next six years, she gave birth to two children, both of who died young. Then, her husband passed away from an unknown illness. A widow at age 26, she found employment as a science teacher in a private school for young Philadelphia ladies called Chestnut Street Female Seminary. In 1875 and 1876, she attended the Harvard Summer Short Courses in Botany, the only scientific course they offered. From 1877 to 1883, Lloyd attended the Harvard Short Course in Chemistry. That course was created by Charles F. Mabery when he was a first-year graduate student and he continued to teach it even after he became a professor at Case Western. He and Lloyd co-authored three papers in the *American Chemical Journals* (the precursor to JACS) in the area of organic synthesis, making Lloyd the first American woman to publish in that area.

Lloyd later said she had been drawn to chemistry because her husband had been one. During this period, she held a series of increasingly better teaching jobs, ending with Hampton College and the Louisville School

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MESSAGE FROM THE CHAIR



James M. Takacs
Chair of the Department of Chemistry

is kept near 100°. In one experiment, after continuing the action for eight hours, 5.9 grams β -dibromacrylic acid gave 7.9 grams of the crude β -dibromdichlorpropionic acid, which melted without purification above 90°, or 96% of the amount of pure acid theoretically required. I must admit, as a synthetic chemist, it brings a smile to see that UNL's first published research concerned organic synthesis. Even though Nicholson published many more papers during his next 25 years at UNL, this was his only organic one. It resulted from his participation in the Harvard Short Course in Chemistry. It was at this summer course that Nicholson met Rachel Lloyd. Four years later he would hire her as Nebraska's second chemistry faculty.

Excellent undergraduate teaching has also been a priority for the Department since its inception. Undergraduate enrollments in chemistry are up another 6% this Fall and almost 25% over the past four years. I am particularly pleased to note that Professors T. Adrian George and Mark Griep each won 2007 Arts & Sciences College Teaching Awards and Professor Andrzej Rajca was selected Outstanding Small Classroom Educator of the Year by the UNL Association of Students. Congratulations to each of them.

Finally, to you alums, join me in celebrating 125 years of great chemistry from the first chemistry graduate program west of the Mississippi. It started in 1884 with the observation that β -dibromdichlorpropionic acid is readily decomposed by alkaline hydrates, and when the reaction is allowed to progress in the cold, the elements of hydrobromic acid are eliminated with the formation of the corresponding substituted acrylic acid. ... This acid is very soluble in hot, rather sparingly soluble in cold water, and very soluble in carbonic disulphide, chloroform, ether, and alcohol. It crystallises from water in large pearly scales, which melt at 75°-78°. Its composition was determined by analysis.

Dear Chemistry Department Alumni,

It is with pleasure I reproduce the first line of the first research article published by a chemistry professor at the University of Nebraska: *In a brief examination of the action of chlorine on β -dibromacrylic acid, it was found by F. C. Robinson and one of us, that, although the acid was not affected at ordinary temperatures, an addition product could readily be obtained by raising the temperature.* That statement, published by Professor Hudson H. Nicholson in collaboration with his mentor Professor Charles F. Mabery in the *American Chemistry Journal*, 6, 165-169 (1884), began a tradition of chemical research at UNL that now spans 125 years.

Further study of this reaction shows that the most desirable results are obtained in regards to time, as well as the quality and quantity of the product, if the temperature

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Support the Chemistry Department:

If you would like more information about specific needs of the department, such as graduate and undergraduate fellowships/scholarships, award lectureships, or research instrumentation, please contact:

Amber Antholz (402) 458-1182 direct
Director of Development (800) 432-3216 toll free
aantholz@nufoundation.org

Story ideas, activities and achievements can be submitted by sending an email to tjanovec3@unl.edu. Receipt does not guarantee publication and the editor reserves the right to edit for space, clarity, grammar and style.

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Updates:

Alumni members, now you can update your contact information by visiting <http://chem.unl.edu/dept/alumnreg.shtm>

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OUTREACH

UNL CHEMISTRY OUTREACH – INSPIRING SCIENCE IN THE COMMUNITY



Professor Jason Kautz

UNL Professor and General Chemistry Coordinator Jason Kautz is offering a new kind of outreach program to schools across Nebraska: an on-site chemistry demonstration complete with sound and light special effects. Dr. Kautz has been traveling across the state performing four to five such demonstrations per year presenting to students of all ages—elementary, middle, and high school.

*“The goal is to talk about science—to define what science is.
We want to make science more accessible,
and we want the kids to understand that everyone is a scientist
because we all solve problems, and that’s what science is really about.”*

Dr. Kautz has visited schools all over Nebraska—from Arlington to Fremont to Schuyler to local schools in the Lincoln area. Kautz’s trips are funded by the UNL chemistry department, and he is usually accompanied by several faculty or staff members and several undergraduate chemistry students. Two participant schools are randomly chosen to receive a special demonstration at their schools by Dr. Kautz at UNL’s annual Chemistry Day, held in the fall, but schools can also request a visit by Kautz via e-mail.

*“What we really want is to spread the message
that science education, awareness, and literacy is very important.
It’s all about getting kids excited about science.”*

CHEMISTRY DAY 2008

Chemistry Day was held this year on Saturday, October 11, 2008, from 9:00 am-2:30 pm in Hamilton Hall. The program featured a variety of fun and informative sessions, including tours of Hamilton Hall, professors’ labs, an overview of the chemistry program, experimental demonstrations, career exploration, a special lecture of chemistry in the movies, and a free pizza lunch. The purpose of Chemistry Day is to introduce high school students, their parents and their science teachers to the opportunities and careers in the field of chemistry. Approximately 130 participants attended this year’s activities.



FACULTY AND STAFF CHANGES

FACULTY PROMOTION



Dr. Stephen DiMagno

and his Ph.D. in 1991 from the University of California, Berkeley. From 1991-93, he was a postdoctoral research fellow at the University of Pennsylvania. He started at UNL as an assistant professor in 1993 and was promoted to associate professor in 1999. During 2004, Professor DiMagno spent six months as a visiting professor at UCSF in the Department of Molecular Pharmacology. Dr. DiMagno is the author of 36 articles and 16 patents, and he has benefited from research support (\$3M

We are delighted to announce that Dr. Stephen DiMagno has been promoted to full professor effective August 18, 2008. Professor DiMagno received his B.A. in chemistry from Swarthmore College in 1985

as PI) primarily from the National Science Foundation and the Department of Defense. His research specialties include fluorine chemistry and organometallic chemistry. One current research emphasis in his laboratory focuses on improved methods to synthesize fluorinated radiotracers for medical imaging. Many highly desirable diagnostic imaging agents for cancer remain prohibitively expensive for general use. The students working in the DiMagno laboratories have developed the methodology necessary to make these radiotracers affordable.

Dr. DiMagno has distinguished himself teaching undergraduate and graduate organic chemistry for the department since 1993, and he has served on or chaired department, university, and ACS national committees. The chemistry department congratulates Dr. DiMagno on his promotion.



STAFF CHANGE

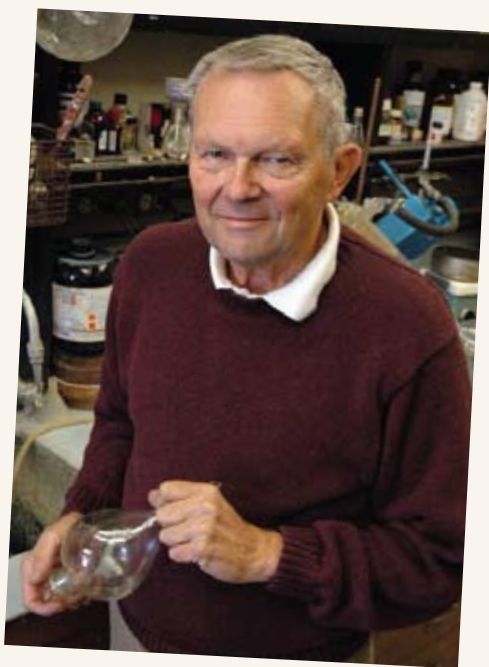
This fall we said goodbye to Leann Galusha, staff assistant to the Chair, who has worked in the chemistry department for seven years. She will still be at the University of Nebraska, assuming a new position in the biochemistry department as an administrative associate. We're going to miss her energetic friendliness and wealth of knowledge, but wish her the best!



Leann Galusha, former staff assistant to the chair

DR. CHARLES KINGSBURY REMINISCES

Dr. Charles Kingsbury began working at UNL in 1967, after graduating from UCLA with a Ph.D. in organic chemistry.



Dr. Charles Kingsbury

I can't believe when I first came to UNL, the gasoline cost twenty-five cents per gallon and there was only one McDonalds in all of Lincoln! The chemistry department was located in Avery Hall and I can still remember working in one giant lab with thirty to forty grad students. It was around that time that Norman Cromwell, in my opinion one of the greatest chairmen of all time, took over the department. He was one of the hardest working and most influential people I've ever met. Due to his efforts, money was raised to build Hamilton Hall and we gladly moved in 1971 from Avery Hall.

As I reminisce about what a typical day was like, I would arrive at Hamilton at about 8:30 am, review my lecture notes, give a lecture, and answer student questions. Then I'd repeat the whole thing again for a second course. My afternoons were devoted to research, creating publications, and meetings, and I was usually home around 5:30 p.m.

*"Throughout my career as a teacher,
I supervised twelve PhD/Masters students,
and taught more than twelve thousand undergraduates."*

It was exhausting work, but still one of my most memorable experiences occurred in the early 90s when I was awarded a grant to give presentations to high school students in small towns across Nebraska. I would drive all around the state in a car from the university, usually by myself, and give demonstrations to various groups of students.

During my tenure at UNL, I enjoyed a number of other significant accomplishments. I was primarily responsible in organizing the Organic Symposiums in 1983, '87, '90, and '93, which drew large numbers of chemists to the UNL campus, and for a number of years in the 1980s, I served as the department's safety chairman.

Several meaningful awards I received included UNL's Outstanding Teacher Award in 1989, the Distinguished Service Award in 1993, and Beta Theta Pi fraternity's award for effective teaching in 1998. Of course, I was always honored to be asked to dine with honor students in the Neihardt dining hall a number of times but perhaps my favorite event was going out for a beer every Monday night with my graduate students in downtown Lincoln.

My forty-one years as faculty at the University of Nebraska–Lincoln chemistry department have been very enjoyable to me. Currently, I am serving as a temporary lecturer and doing a small amount of my own research. One of my favorite hobbies is gardening, and I plan on pursuing that as well as enjoying my grandchildren in the years to come.

AWARDS AND ACHIEVEMENTS

FACULTY

Tiny Tools, Big Potential

BY UNL OFFICE OF RESEARCH, ANNUAL REPORT 2007-08

UNL chemist David Hage is creating tools so small he needs a microscope to see them, but they promise to help scientists make big advances in fields as diverse as medicine and the environment. Hage uses high-performance affinity chromatography to rapidly separate



Dr. David Hage

and measure specific compounds in complex fluids. For example, he might be looking for a drug in a drop of blood, a pesticide in water or an explosive dissolved in liquid.

To find his target substance, Hage packs columns often smaller than a millimeter with a biological compound known to bind to the target, such as an antibody. He passes the fluid through this column under specific conditions. Seconds later, the target –now attached to the antibody – can be extracted and measured, even in miniscule amounts. “There are an enormous number of molecules even in a small blood sample,” he said, “but antibodies give us the ability to fish out or target a particular compound.”

Developed with funding from the National Institutes of Health, the U.S. Environmental Protection Agency and the U.S. Geological Survey, Hage’s tools, several of which are patented, have many applications. These include finding and measuring contaminants in water, helping forensic scientists detect explosives in liquids, and determining amounts of a drug or hormone in blood for improved diagnosis and treatment.

Hage’s techniques also can help drug companies study how new drugs will behave in humans by testing how a drug binds to proteins and other compounds. Such information can help determine dosage levels. “We’re developing new tools where we can get away from the human and animal studies for a lot of this work,” he said. “It has the potential to really speed up the development process for new drugs and to reduce costs.”

Now he’s working toward personalizing health care. People’s reactions to drugs vary. By testing an individual patient’s blood to see how it responds to a drug, doctors may be able to determine the best dosage for that patient. People with diabetes, depression and heart disorders are among those who would benefit from this individualized approach.

2008 Service Awards

Congratulations! Seven chemistry faculty were honored at the 2008 Service Awards Program on September 4, 2008 in celebration of their commitment to the University of Nebraska. The University of Nebraska–Lincoln presents a service award to all regular employees who complete intervals of five calendar years of service, calculated on consolidated or continuous regular employment.

Years of Service	Awardee
5 years	Robert Powers
15 years	Stephen DiMagno
15 years	Xiao Cheng Zeng
20 years	James M. Takacs
20 years	Patrick H. Dussault
25 years	Ronald Cerny
40 years	T. Adrian George

Congratulations!

Dr. Liangcheng Du received a special invitation to the 2nd SINO-US Roundtable Conference on Chemical Biology and New Drug Discovery held in Changsha, China September 15-18, 2008. Besides a few select speakers from U.S. medical schools, conference attendees included colleagues from the Chinese top universities, the Chinese Academy of Sciences, and high-ranking government officials from the Department of Sciences and Technology in Beijing, the governor of Hunan Province and other officials from the city of Changsha.

Dr. David Hage has been elected Fellow to the National Academy of Clinical Biochemistry. The National Academy of Clinical Biochemistry (NACB) is dedicated to advancing the science and practice of clinical laboratory medicine through research, education, and professional development.

Dr. David Berkowitz was awarded a Japan Society for the Promotion of Science Fellowship for 2008-09. This program is designed to enable Japanese researchers to invite their foreign colleagues to Japan to participate in cooperative work and other academic activities. Researchers of all countries having diplomatic relations with Japan are eligible.

Department Chair, **Dr. James Takacs**, was awarded the 2008 Arts and Science College Award for Outstanding Research and Creative Achievement in the Sciences given in honor of outstanding research or creative activity of national/international significance conducted by individual full-time faculty members at the University of Nebraska. The awards are given for a sustained record of excellent accomplishment in research or creative activity.

Dr. Andrzej Rajca was awarded 2008 Outstanding Small Classroom Educator of the Year by the UNL Association of Students.

Dr. T. Adrian George and Dr. Mark Griep received 2008 Department of Arts & Science's Distinguished Teaching Awards. Faculty members chosen are given distinguished teaching awards upon the recommendation of the college and receive a \$1,000 cash award through funds provided by the Nebraska Legislature.

Drs. Rick Hartung, Jason Kautz, and Eric Malina received 2007-08 Parents Association Awards. The Parents Association requests parents, through an annual mailing, to nominate a faculty or staff employee who has made a significant difference in their student's life.

New Funding: January – November 2008

The following are newly funded grants received by the chemistry faculty. Congratulations!

Funding Agency: Energy Research Grant – Cycle 3
Title: Establishing the Synthetic Potential of Geothermal Dehydrogenases
Project Start: October 1, 2008
PI: Dr. David Berkowitz
Co-PI: Dr. Paul Blum, School of Biological Sciences

Funding Agency: ONR/MURI
Title: Multi-Laser-Beam Open-Atmosphere Surface Coating Techniques Based on Precursor Excitation, Photodissociation and Controlled Cooling
Project Start: August 1, 2008
PI: Yonfeng Lu, Department of Electrical Engineering
Co-PI: Dr. Xiao Zeng

Funding Agency: UNL Strategic Research Cluster Grant
Title: Nebraska Center for Rapid Bioanalysis
Project Start: September 1, 2008
PI: Dr. David Hage
Co-PIs: Drs. Barry Cheung, Rebecca Lai, Robert Powers; and Dr. Gregory Bashford, Biological Systems Engineering

Funding Agency: NIH R21
Title: High-Spin Nitroxide Diradical for Biomedical Imaging Applications
Project Start: September 15, 2008
PI: Dr. Andrzej Rajca
Co-PI: Dr. Suchada Rajca

Funding Agency: Energy Research Grant – Cycle 3
Title: A Route to Store Off-peak Energy: New Hydrogen Storage Materials and Synthetic Strategy to Optimize Hydrogen Absorption
Project Start: October 1, 2008
PI: Dr. Wonyoung Choe

Funding Agency: Department of Energy –EPSCoR
Title: Rational Design of Molecular Ferroelectric Materials and Nanostructures
Project Start: June 15, 2008
PI: Dr. James Takacs

Funding Agency: National Science Foundation
Title: Self-organized Nanolayers for Organic Thin-Film Transistors
Project Start: September 1, 2008
PI: Li Tan, Department of Engineering Mechanics
Co-PI: Dr. Xiao Zeng

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AWARDS & ACHIEVEMENTS

Grants continued from page 7

Funding Agency: Army Research Office (DEPSCoR)
Title: Bi-functional Pentacene Monolayer for Organic Field-effect Transistors
Project Start: June 1, 2008
PI: Dr. Li Tan, Department of Engineering Mechanics
Co-PI: Dr. Xiao Zeng

Funding Agency: NIH
Title: Biosynthesis of HSAF, an antifungal natural product with a novel mode of action
Project Start: June 17, 2008
PI: Dr. Liangcheng Du

Funding Agency: National Science Foundation
Title: Ligand Scaffold Optimization for Catalytic Asymmetric Hydroboration
Project Start: July 1, 2008
PI: Dr. James Takacs

Funding Agency: Nebraska Public Power District
Title: UNL/NPPD Energy Storage Option Analysis
Project Start: March 1, 2008
PI: Dr. Yasar Demirel, Chemical and Biomolecular Engineering
Co-PIs: Dr. Stephen DiMagno, Chemistry; Dr. Paul Blum, Biological Sciences; and Dr. Jerry Hudgins, Electrical Engineering

Funding Agency: U.S. Department of Defense – DARPA
Title: Detection of Emerging Classes of Explosives
Project Start: April 14, 2008
PI: Dr. Patrick Dussault
Co-PIs: Drs. R. Cerny, S. DiMagno, D. Hage, G. Harbison, and J. Redepenning

Funding Agency: UNL Layman Award
Title: Hydride Vapor Phase Synthesis of Metallic Hexaboride Nanomaterials
Project Period: June 1, 2008
PI: Dr. Barry Cheung

Funding Agency: NSF EPSCoR First Award
Title: Porphrin-based Hydrogen Storage Materials
Project Start: May 15, 2008
PI: Dr. Wonyoung Choe

Funding Agency: NSF EPSCoR First Award
Title: Metallic Boride Nanostructures as Cold Field Emission Materials
Project Start: May 15, 2008
PI: Dr. Barry Cheung

Funding Agency: Nebraska EPSCoR
Title: CAREER: Metallic Boride Nanostructures as Cold Field Emission Materials
Period of Funding: May 15, 2008
PI: Dr. Chin Li Cheung

Funding Agency: Nebraska EPSCoR
Title: CAREER: Porphyrin-based Hydrogen Storage Materials
Period of Funding: May 15, 2008
PI: Dr. Wonyoung Choe

Funding Agency: American Heart Association
Title: An NMR Based Systems Biology Approach Toward Preventing Staphylococcal Infective Endocarditis
Project Start: January, 2009
PI: Dr. Robert Powers

Funding Agency: National Science Foundation
Title: Directed Reactions of Carbonyl Oxides: A New Approach to Ozonolysis
Project Start: February 15, 2008
PI: Dr. Patrick Dussault

Funding Agency: University of California Lawrence Livermore Natational Lab
Title: Low Stress Conformal Boron-10 Coatings of High Aspect Ratio Structures
Project Start: September 1, 2007
PI: Dr. Barry Cheung

Funding Agency: National Science Foundation
Title: Stable High-Spin Polyradicals and Chiral pi-Conjugated Systems
Project Start: November 15, 2007
PI: Dr. Andrzej Rajca

Funding Agency: National Science Foundation
Title: NIRT: Nanomanufacturing and Analysis of Active Hierarchical Nanofilamentary Nanostructures
Project Start: November 15, 2007
PI: Dr. Yuris Dzenis, Engineering Mechanics
Co-PIs: Dr. Joseph A. Turner, Engineering Mechanics; Dr. Qiming Zhang (subaward); and Dr. Xiao Cheng Zeng, Chemistry

STAFF

Evan Meade, Pat Pribil and Renee Barfoot

Recipients of the APPLAUSE Award



Evan Meade



Pat Pribil



Renee Barfoot

The APPLAUSE Program recognizes consistently outstanding performance and service above and beyond the call of duty to Managerial/Professional (B-line) and Clerical/Tech/Service (C-line) staff in the College of Arts & Sciences.

Applause awards over the last six months have gone to **Evan Meade**, laboratory storekeeper in the Department of Chemistry and **Pat Pribil**, scientific instrument maker for the Chemistry and Physics Department, and **Renee Barfoot**, supply control clerk.

Evan's nominators say: "Evan wears many hats in the operation of the general chemistry stockroom. He makes solutions, answers questions, and provides equipment and chemicals for 3000 chemical students a year. Evan is one of those great employees who is always willing to lend a helping hand to whatever project is at hand and we greatly appreciate his dedication to the department."

Pat's nominators share: "I am pleased to nominate Pat Pribil for an applause award. Pat consistently demonstrates a positive attitude and a strong work ethic. I appreciate the extra effort he makes to deliver high quality parts in a timely manner. Pat is a very valuable employee and deserves this special recognition."

Nominations for Renee say: "Renee manages to juggle multifarious tasks while always maintaining a positive attitude, and showing compassion for other members of the chemistry community. She brings a can-do attitude to everything she tackles and is also a great friend and support to many graduate students."

Applause
The Perfect Thank You

Date _____

Pay to the Order of _____ \$ **200.00**

Two Hundred and ^{no}/100 _____ Dollars

(Your monetary award will be added to your next paycheck.)

UNIVERSITY OF Nebraska | COLLEGE OF ARTS AND SCIENCES
Lincoln | Office of the Dean

Memo Staff Awardee

History continued from page 1



Rachel Lloyd
in 1892 Student Yearbook



Hudson Henry Nicholson

of Pharmacy for Women, both in Kentucky. Hampton awarded her with an honorary masters degree based on her extensive training. She left those positions to enroll in the chemistry graduate program at the University

of Zurich where she worked with Professor V. Mertz. It was the only university at the time to award Ph.D.s to women in the sciences. She obtained her degree in 1886 at age 47, making her the first U.S. woman Ph.D. chemist. Her dissertation work concerned the conversion of phenols to aromatic amines at high temperatures.

On June 25, 1887, she accepted the offer to become an associate professor of analytic chemistry at the University of Nebraska. She also became the first assistant chemist of the newly formed Agricultural Experimental Station located on the eastern edge of Lincoln. Both of her appointments began July 1, 1887. Lloyd's first year of teaching at Nebraska was

very successful. Her freshman and sophomore students could tell that she was an experienced, accessible and knowledgeable teacher.

In summary, Nicholson assisted in the construction and outfitting of the Chemical Laboratory, the campus's second building, and then hired a second chemistry professor, Dr. Rachel Lloyd. Her training in botany and extensive training in chemistry meant she was the perfect choice to bring Nicholson's vision of sugar beet research to Nebraska. In part three, we'll see that the Department's next five years focused on beet sugar agriculture, industry, and instruction. It earned an international reputation as one of the Top Chemical Research programs.

AWARDS & ACHIEVEMENTS

CONGRATULATIONS TO GRADUATES

2008 PhD Graduates

Name	Area	Adviser	Initial Placement
Wei An	Physical	Zeng	Postdoc, University of Alabama
Min Bian	Analytical	Hage	Analytical Scientist, Madison, Wisconsin
Chunlei Guo	Physical	Harbison	Working in China
Jeremy Karr	Analytical	Redepenning	Faculty, Newman University, Wichita, Kansas
Kelly Mercier	BioAnalytical	Powers	Nat'l Institute of Environmental Health Sciences, Dr. Robert London Lab
Shin Moteki	Organic	Takacs	Postdoc, University of Kyoto, Japan
Jodell Whittington	Biochem	Parkhurst	Postdoc, University of Utah Medical School

2008 Masters Graduates

Name	Area	Adviser
Mandi Conrad	Analytical	Hage
Van Nguyen Mai	Physical	Eckhardt
Sony Soman	Analytical	Hage
Manuela Stan	Organic	Takacs
Curtis Wray	Inorganic	Choe
Qing Zhang	Organic	Takacs

2008 Chemistry Major Graduates (May & August)

Jessica Iraima Peinado
Susannah Catherine Hall
Michael Duc Nguyen
Jacob Michael Oran
Regina Rawlings
Robert Andrew Waters
Diep Ngoc Dinh
Nicholas Andre Lehmann

STUDENT AWARDS

Raychelle Burks

Congratulations to Raychelle Burks, Ph.D. student (Hage Research Group) who was a contributing author for the new "Defining Moments in Science" book. The book covers widely-familiar inventions, great scientific thinkers such as Einstein and Stephen Hawkings, ground-breaking discoveries and mind-boggling theorems that altered the way we see the world.

Chemistry Department Awards, 2007-08

Fred W. Upson Grant-in-Aid: **John Schiel** (Hage)

Fuerniss Award: **Shin Moteki** (Takacs)

Graduate Teaching Assistant Award: **Mark Craddock** (DiMagno),
Christopher McCune (Berkowitz), **Judy Miska** (Takacs),
Jaime Stark (Powers)

Graduate Research Assistant Award: **Kelly Mercier** (Powers),
Nan Shao (Zeng)

University Awards

John Schiel (Hage)
\$2,000 Fellowship award

Nan Shao (Zeng)
2008 Presidential Fellowship
See story on page 13.

*Congratulations to
all 2008 Chemistry
Department Graduate
Student Awardees!*

UNDERGRADUATES

Undergraduate Performance

Every year, all chemistry majors who are in their senior year participate in two types of assessment exercises: 1) they take the ETS Standardized Exam for Chemistry, and 2) they participate in an Exit Interview with the chemistry chair. The results from these two tools are anonymized, summarized by the Assessment Czar Dr. Griep, and then discussed by the chemistry faculty at one of their meetings.

One thing we've learned is that overall UNL GPA is positively correlated with performance on the ETS Chemistry Field Test. Another thing we've learned is that performance on the four sub-tests is positively correlated with specific chemistry courses. This indicates that UNL's liberal arts education in general and the chemistry courses in particular are training our majors well enough to compete on a National scale. In fact, the performance of our majors has been excellent. On average, our students perform at the 85th percentile, which places our department at the 95th percentile in the National ranking. Congratulations chemistry majors!



**Announcing our NEW
CHEMISTRY ALUMNI WEB SITE**
<http://chem.unl.edu/alumni/index.shtml>

Offering:

Class Listings: Current listings of Ph.D., Masters, and BS/BA graduates

Connections: Career Networking Services provide links to job listings, help with chemistry job searches, and opportunities to use Chemistry Facebook Group and LinkedIn for social and professional networking.

Update your contact information at

<http://chem.unl.edu/dept/alumnreg.shtml>

Events/News: Keep up with current events, past happenings, Alumni Newsletter, Alumni Stories

Support the Department: Learn how to support the UNL Chemistry Department through a variety of ways

2008 Summer Research Program

The 2008 Summer Research Program in the chemistry department provided outstanding undergraduates the chance to work closely with faculty whose expertise is closely related to the students' academic interests and career goals in an intensive summer research experience while providing first-hand exposure to the experiences of graduate school life.

Students worked under faculty mentorship as part of a research team that included graduate students, research scientists, and other program students. During the summer program, participants mastered important research skills and contributed to projects that were a vital part of the academic experience and a realistic foundation for advanced study, helping them prepare for future graduate work.

The University of Nebraska–Lincoln Office of Graduate Studies coordinated the 2008 Summer Research Program which also provided many opportunities for teambuilding through cultural and social activities.



ALUMNI FOCUS

REMEMBERING OUR OUTSTANDING ALUMS



Dr. MariJean Eggen

It's an honor to continue to provide stories about our prestigious Alumni who are making a difference in the field of chemistry and the world.

This issue we are featuring Dr. MariJean Eggen, who received her B.S. in Chemistry from North Dakota State University in 1991 and her Ph.D. in Organic Chemistry from the University of Nebraska–Lincoln in 1996. Post-Doctoral Research associate work was done at the University of Kansas Medicinal Chemistry Department from 1997-2000. She was one of Dr.

David Berkowitz's first graduate students and the first student working in the area of hydrolytically stable phosphate analogues. Her thesis title was "Synthesis of (β , β -difluoromethylene)phosphate analogs of phosphosugars and phospho-amino acids."

"We worked very hard, but Dave (I get to call him that now) was always ready to answer questions and was a fantastic teacher. I remember on some days I would run a recitation, set up two reactions, run another recitation and set up two more reactions, work them up, do analysis and grade quizzes."

Dr. Eggen remembers grad school as being a lot of hard work, but as a group they had a lot of fun as well. "Our class was relatively small and diverse, but we all got along. One summer weekend, many of us went camping at a reservoir in the Sandhills. The swimming and bon fires were great."

"Often we would go out after cumulative exams and we also went out for wings or singing. I remember one time it was my birthday and others planned a surprise gathering for me. Another bit of fun was going to Husker home games! We would get a section of tickets and have a blast standing up through the entire game. I saw three national championship teams while I was there."

Currently, Dr. Eggen is a medicinal chemist in the area of early lead generation drug discovery at Eli Lilly. In other words, she's one of the

early organic/medicinal chemists attempting to find a compound that is active primarily in a chosen cancer target. The effort is different for each target, and requires unique tools for each problem. As the project moves ahead, she works with a team of chemists to optimize the potency and other properties and figure out how to make new analogues of our starting active. Her chemistry team works with people from many different areas including biology, ADME and tox to identify opportunities with the best overall profile and attempt to optimize it all the way through to preclinical activities.

*"My job is always evolving.
If you like repetition, it's probably not the job for you."*

She definitely believes her time at graduate school prepared her very well. Thinking about problems in detail and how to solve them is a skill necessary for Dr. Eggen's current job.

*"What compound should I make to solve this issue?
To make a drug candidate you have to think
multidimensionally and often are optimizing properties
and/or activities in parallel. All of that starts with drilling
down through the data, forming a hypothesis, designing key
compounds and then figuring out how to make them."*

"Another important feature of grad school was teaching lab and running recitations. At the time, it seemed like a pain, and sometimes is not as respected among the other graduate students as it should be. In reality, much of what I do day-to-day deals with interacting with colleagues from chemistry and from other areas. You have to have strong verbal and written skills to focus your team on the issues and drive the effort as quickly as possible. Often as scientists we are naturally comfortable working independently, but in drug discovery research it really requires a team."

MariJean is married to Jon Eggen who works at the Indiana Department of Natural Resources. They live in Brownsburg, Indiana (suburb of Indianapolis) and have two children, Eirik and Annika.

Support
the
Chemistry Department

Chemistry Alumni Graduate Fellowship Fund

Visit the Chemistry website at www.chem.unl.edu, click on icon in lower left side of homepage, and join other alums in our effort to attract and support the best and brightest graduate students in our program.

GRADUATE STUDENT FOCUS

RESEARCHING FOR SUCCESS

There are over 4,400 graduate students at the University of Nebraska and a multitude of graduate fellowships given, but Nan Shao, a Ph.D. student in physical chemistry with Dr. Xiao Cheng Zeng, has been one of the few students chosen to receive UNL's 2008 most prestigious fellowship, the Presidential Fellowship. It is awarded only to those graduate students who have demonstrated the highest levels of academic performance. The purpose of the fellowship is to allow a graduate student to immerse themselves in scholarly and research activities during the final year of a degree program. The award carries with it a stipend, tuition, fees and health insurance payment.

Nan is originally from China and has worked in Dr. Zeng's research lab since 2005. When she was looking at schools, she wanted to find somewhere with a great department, but not a huge department since she believed it would be more difficult for students to focus on research at a huge school. UNL had the perfect mix for her—a perfect size department in the perfect size town of Lincoln.

The research opportunities are what Nan loves and has been given many experiences in this area as a student. She is currently studying the theoretical simulations of clusters by using quantum and empirical methods to look for the lowest energetic isomers with good chemical properties. What makes her excited is the computational chemistry, which can help people explore the unknown world by the most accurate ab initio calculations.

***“The lab I work in is very free.
Of course, my research has to pertain to the
research being covered in my professor's lab,
but if I want to do a little of my own research,
I can pursue that knowing that Dr. Zeng will support me.
There is really such a great environment
for research here at UNL.”***

Nan has also enjoyed learning from the other faculty in the chemistry department.

***“The teaching here is very strong and I took three classes from
Dr. Langell who is a great teacher! Everyone loves her classes.
I've had nothing but good experiences with the teachers I had
here and all of the faculty are always willing to help if they can.”***

Throughout her tenure at UNL, Nan has already published nine papers and also received the Department of Chemistry's 2008 Graduate Research Award. Her current work focuses around the theoretical simulation of chemistry. In the future, she hopes to continue to pursue this, and nanoscience simulations in particular.



Presidential Fellowship winner Nan Shao with adviser Dr. Xiao Cheng Zeng.

DEPARTMENT LECTURESHIPS

CLIFFORD S. HAMILTON LECTURESHIP IN ORGANIC CHEMISTRY

The Cliff S. Hamilton Award in Organic Chemistry is supported by a fund managed by the University of Nebraska Foundation. The principal donor to this fund was the late Mrs.

Cliff S. Hamilton, the purpose of which was to commemorate the life of Dr. Cliff S. Hamilton. The Hamilton family's interest in the fund is represented by two Hamilton children, Mrs.

Martha Hamilton Dickey of Denver, Colorado, Dr. Cliff S. Hamilton, Jr., of Fargo, North Dakota and Mrs. Margaret R. Hamilton of Wilmette, Illinois (wife of the late Robert W. Hamilton). The income from the fund is used to bring internationally recognized leaders in organic chemical research to the University of Nebraska–Lincoln campus to deliver seminars about their research.



Professor Cliff S. Hamilton
November 23, 1889 - April 7, 1975



Professor Paul A. Wender
Stanford University, 2008 Hamilton Awardee

This year's HAMILTON AWARD recipient was Professor Paul A. Wender, Stanford University. He was recognized for his outstanding contributions to chemistry, biology, and medicine, especially the design molecules that exhibit unique biological activity and therapeutic potential, and the development of new ways of synthesizing such compounds. His presentation at the award celebration was titled, "The Chemistry-Medicine Continuum Part I: New Strategies for Breaching Biological Barriers and Overcoming Resistant Disease."

Paul A. Wender (Ph.D., Yale University with Fred Ziegler; National Institutes of Health (NIH) Postdoctoral Fellow, Columbia University with Gilbert Stork) is currently the Bergstrom Professor of Chemistry at Stanford University, Professor of Chemical and Systems Biology, a cofounder of the Quantitative Chemical Biology Program, on the science advisory boards of the Stanford Molecular Imaging and Epithelial Biology Program, an associate of the Program for Molecular and Genetic Medicine and a member of the Cancer Pharmacology Program. He is also a cofounder, science adviser and board member of CellGate, a biotech company pioneering new strategies for drug delivery and cofounder of AMG BioPharma, a biotech company focused on cancer therapies developed in his laboratories.

Cliff S. Hamilton's research interests included the synthesis of organic compounds containing arsenic, antimony or phosphorus, and the study of heterocyclic compounds utilizable as drugs. He helped develop Mapharsen, an arsenical once widely used, and Camoquin, an antimalarial. He served as chair of chemistry



Professor Wender receiving the 2008 Hamilton Award from James M. Takacs, Chair of the Department of Chemistry

Hamilton continued on page 15

PUBLICATIONS

A SELECTION OF PUBLICATIONS FROM 2008

Cobalt Oxide Surface Chemistry: The Interaction of CoO(100), Co₃O₄(110) and Co₃O₄(111) with Oxygen and Water.

S.C. Petitto, E.M. Marsh, G.A. Carson and **M.A. Langell**. *J Molecular Catal. A*, **281**, 49-58.

Cation-Cation Stacking in Small Ionic Clusters of 1,2,4-Triazolium.

Li, Hui; Boatz, Jerry A.; Gordon, Mark S., Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE, USA. *Journal of the American Chemical Society* (2008). 130(2), 392-393. Publisher: American Chemical Society.

Rapid Protein-Ligand Costructures Using Chemical Shift Perturbations.

Stark, Jaime; **Powers, Robert**. Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE, USA. *Journal of the American Chemical Society* (2008). 130(2). 535-545. Publisher: American Chemical Society.

Diarylnitroxide Diradicals: Low-Temperature Oxidation of Diarylamines to Nitroxides.

Andrzej Rajca, Matthew Vale, Suchada Rajca. *Journal of the American Chemical Society* (2008). 130.

Reconstruction of Anorganic Mammalian Bone by Surface-Initiated Polymerization of L-Lactide.

Wiegand, Troy; Karr, Jeremy; Steinkruger, Jay D.; Hiebner, Kris; Simentich, Bobby; Beatty, Mark; **Redepenning, Jody**. Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE, USA. *Chemistry Materials* (2008). Publisher: American Chemistry Society.

Exploiting self-assembly for ligand-scaffold optimization: Substrate-tailored ligands for efficient catalytic asymmetric hydroboration.

Moteki, Shin A.; **Takacs, James M.** Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE, USA. *Angewandte Chemie, International Edition* (2008). 47(5), 894-897. Publisher: Wiley-VCH Verlag GmbH & Co. KGaA.

Lotus Effect in Engineered Zirconia.

Namavar, Fereydoon; **Cheung, Chin Li**; Sabirianov, Renat F.; Mei, Wai-Ning; **Zeng, Xiao Cheng**; Wang, Gonghua; Haider, Hani; Garvin, Kevin L. Department of Orthopaedic Surgery and Rehabilitation, Nebraska Medical Center, Omaha, NE, USA. *Nano Letters* (2008). 8(4) 988-996. Publisher: American Chemical Society.

Immobilization of 1-acid glycoprotein for chromatographic studies of drug-protein binding II. Correction for errors in association constant measurements.

Mallik, Rangan; Xuan, Hai; Gulochon, Georges; **Hage, David S.** Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE, USA. *Analytical Biochemistry* (2008). 376 (1), 154-156. Publisher: Elsevier.

Names in red indicate UNL chemistry faculty.

Hamilton continued from page 14

from 1939 to 1955, and also as Dean of the Graduate College during 1938-1939 and 1940-1941, retiring in 1957. He was a long-time consultant to Parke, Davis and Company in Detroit, consulting from 1927 until 1963. Dr. Hamilton was chair of the Nebraska Section from 1924-1926, chair of the Organic Division in 1940, and chair of the Divisional Officers Group of the American Chemical Society in 1940-1941. He served on the Editorial Board of *Organic Syntheses* (1942-1949), as associate editor of *Organic Reactions*, Volume 2, in 1944, and as an associate editor of *Chemical Reviews* from 1946-1948. His honors included an honorary Doctor of Science Degree from Monmouth College in 1954, the Midwest Award of the St. Louis Section of the American Chemical Society in 1955, and the

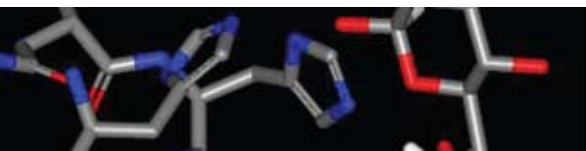
new chemistry building at the University of Nebraska–Lincoln was named in his honor on October 25, 1970.

Previous HAMILTON AWARDEES include:

2007-08 Christopher T. Walsh
2006-07 Shu Kobayashi
2004-05 Manfred T. Reetz
2003-04 George M. Whitesides
2002-03 Eric N. Jacobson
2001-02 Yoshito Kishi
2000-01 Robert H. Grubbs
1999-00 Peter B. Dervan
1998-99 Ryoji Noyori
1996-97 K. C. Nicolaou
1995-96 Dieter Siebach
1994-95 K. Barry Sharpless
1993-94 Samuel J. Danishefsky

1992-93 Larry E. Overman
1991-92 David A. Evans
1990-91 Jean-Marie P. Lehn
1989-90 Donald J. Cram
1988-89 Barry M. Trost
1987-88 Derek H. R. Barton
1986-87 Gilbert Stork
1985-86 Wolfgang Oppolzer
1984-85 Satoru Masamune
1983-84 Vladimir Prelog
1981-82 Herbert C. Brown
1980-81 Albert Eschenmoser
1979-80 Elias J. Corey

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2008 CHEMISTRY SUMMER BARBECUE

In June, the chemistry department held its fourth annual summer barbecue. All of Hamilton Hall was invited outside for burgers and brats in a potluck-style meal. Everyone brought lawn chairs and enjoyed socializing and great food. Nearly 150 staff, faculty, and students attended the event.

2008 CHILI COOK-OFF

The 2008 Chili Cook-Off was held on October 31 and included Halloween costumes in addition to our regular festivities. Judges this year were from the Chancellor's office, Lincoln Journal Star, the UNL Athletic Department, and the College of Arts & Sciences Dean's office. The sought-after wooden spoon awards were given to Carita Kordik, DeNeice Steinmeyer, Mike Cook, Kate Shaner, and Darrel Kinnan for their excellent chili and/or side dishes.



WHAT'S HAPPENING IN
CHEMISTRY