MINNESOTA CHEMISTS NEWSLETTER

Department of Chemistry
UNIVERSITY OF MINNESOTA

Fall 1991

A Letter from the Chair

W. Ronald Gentry

It is a pleasure to have this opportunity to say hello to all the alumni, friends, and supporters of the Department of Chemistry at the University of Minnesota.

As I look back on my first two years as department chair, and prepare to begin a third, I am impressed with both the strength and the fragility of our academic enterprise. The Department of Chemistry has enormous strengths, many of which are mentioned in the pages of this newsletter. In a time when much is being written about the crises in science literacy, the decline of interest in science careers among young people, the shortage of funding for fundamental research, and the difficulty of attracting exceptionally talented young scientists to university faculty positions, our department is in fact thriving.

Our external research funding is up substantially this year, to nearly $6 million for the department, or $160,000 per faculty member. We have about 65 new graduate students starting this fall—the largest number we have seen for many years. We are also witnessing a dramatic increase in our overall undergraduate chemistry enrollments and in the number of our undergraduate chemistry majors. This year we graduated 43 students with ACS-certified B.S. degrees, up from 31 in 1990 and 32 in 1989. We have improved and overhauled various aspects of our undergraduate advising and registration procedures, and are particularly proud of our expanding computer-aided instruction facility, which is dedicated to use in undergraduate chemistry courses. Our new faculty additions are superb, as can be seen from their tremendous success in competing for research grants and both local and national awards (please see the "Ovations" section). For the future, one of the most encouraging signs we see is the overwhelming success of our outreach programs, designed to interest elementary, secondary and beginning college students in chemistry (please see article, this page).

Despite these great strengths, our department and the University of Minnesota also remain fragile in many ways. We, like many other public universities, have suffered severe budget cutbacks this year due to state economic conditions. Students are also coming under greater financial pressure, as the university was forced to increase tuition by 9% over last year. It is distressing that this comes at a time when it is more difficult for us to offer fellowships and teaching assistantships to graduate students, and scholarships to our best undergraduates. It is also becoming increasingly difficult for us to find the funds needed by new faculty members to get their research programs started.

Thus, the active support of our alumni and friends has become especially critical this year. Those of you who are able to help should know that any contribution is greatly appreciated. Gifts can be sent either to the University of Minnesota Foundation and designated for the Department of Chemistry, or directly to the department. They may be unrestricted, or designated for a specific purpose such as research, undergraduate scholarships, graduate fellowships, or support of our outreach programs.

(Letter to page 5)

Chemistry Department Reaches Out

A group of about 25 graduate and undergraduate chemistry students have formed an outreach group with the goal of getting younger students interested in chemistry. These volunteers have made over forty visits during the past two years to local elementary schools, junior and senior high schools, and to the Science Museum of Minnesota, doing demonstrations and discussing career opportunities in chemistry. The demonstrations, which include a number of interesting chemistry experiments designed to illustrate various important principles, are very visual and focus on chemical transformations such as polymer synthesis, exothermic and endothermic reactions, chemiluminescence, catalysis, electrochemistry, etc. Several of the demonstrations provide hands-on experiments for up to 30 students in a class. In addition, materials have been prepared which aid in the understanding of the demonstrations without the use of chemical symbols or formulas. The materials are intended primarily for students who have not had previous coursework in chemistry, though the level of discussion is increased as appropriate for more advanced students. The idea is to show that chemistry is fun, anyone can do chemistry, and that there are rewarding career opportunities within reach. These visits have the added benefit of improving contacts between the University and kindergarten through twelfth grade science teachers.

Considerable effort has been spent developing these demonstrations, and new ideas are welcome. The guiding principles are that demonstrations should be interesting, relevant to everyday life experiences, and illustrative of the types of things chemists actually do. Experiments which can't be explained, and ones that go "bang," are avoided. The program is coordinated by Director of Undergraduate Studies **Lou Pignolet**, and he would welcome your comments and suggestions.

(Reaches Out to page 5)

An unidentified young participant at Chem Day, 1990

Research Profiles

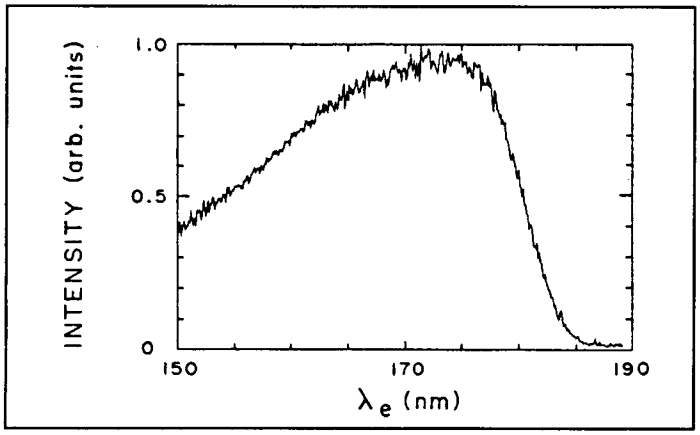
Sandy Lipsky

Sandy Lipsky's research program is concerned mainly with studying the properties of highly excited states of organic liquid systems. These states are typically generated by exposing the system of interest to high energy photons or fast electron radiation. His work has a number of important goals. He is attempting to develop a framework for predicting radiation effects, and how to interfere with or utilize these effects, i.e., how to develop materials that are either resistant to radiation damage or respond usefully to exposure to radiation. He is also very interested in developing systems for efficiently converting short wavelength solar radiation to electrical or chemical energy.

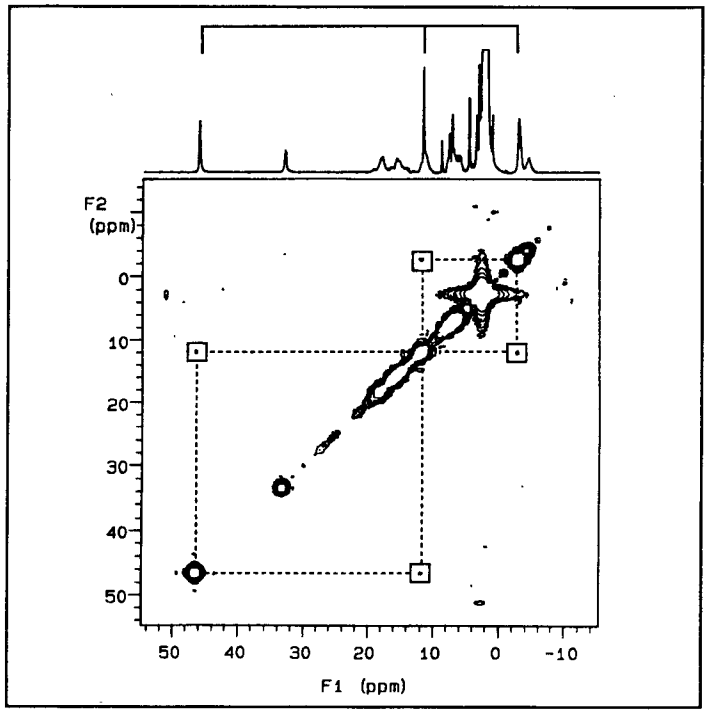
Much of his recent work has been focused on elucidating the nature of ionizing transitions in liquids and the behavior of the geminate ion-pair states that these transitions generate. Although ionization of a molecule in the gas phase is a rather well characterized process, very little is known about electron ejection in disordered, condensed phases such as nonpolar, nonreactive hydrocarbons. Sandy is studying the effect of photon energy, the nature of the solvent environment, and the strength of applied electric and magnetic fields on both those geminate pairs that escape their Coulomb field and give photo current, and those pairs that radiatively recombine.

Fluorescence from an excited electronic state is often only a very minor channel for its decay. This is particularly true of highly excited electronic states. Fluorescence from these states is extremely weak due to their very rapid, non-radiative conversion to states of lower energy. Nevertheless, it has been possible to detect extremely weak emissions from upper states of some simple aromatic and olefinic molecules with sufficient intensity to permit evaluation of their spectral distributions and quantum yields. With this information it is possible to begin to understand some aspects of the mechanism of internal conversion of electronic energy between states close to the ionization limit.

The very weak emissions from the lowest excited electronic states of saturated hydrocarbons is also being studied. The weakness of these emissions is due to the rapidity with which dissociative processes occur in these molecules. The photophysical properties of saturated hydrocarbons have been generally unexplored due to the relative inaccessibility of the spectral region required to excite them. In Sandy's lab these states are accessed using either very stable molecular continua or atomic line sources in the vacuum ultraviolet, or using pulsed lasers that are frequency doubled or tripled or appropriately Raman upshifted.



*Intensity of fluorescence at λ_f = 210 nm of deaerated cyclohexane per incident quantum of exciting wavelength, λ_e, as a function of λ_e (David B. Johnston and Sanford Lipsky, Journal of Physical Chemistry, **1991**, 95, 1896-1902)*



^{1}H-COSY NMR spectrum of the paramagnetic high valent intermediate [(TPA)Fe=0]$^{3+}$ (TPA=tris(2-pyridylmethylamine) (work of R. A. Leising and L.-J. Ming in Professor Que's laboratory)

Larry Que

Larry Que and his research group are primarily concerned with metalloprotein structure and function, and the synthesis of model complexes that serve as instructional analogs as well as functional mimics. In their work on the metal sites of proteins, they use optical, NMR, EPR, resonance Raman, EXAFS, and Mössbauer spectrometry to obtain physical parameters characteristic of the coordination sites. These data provide clues to the nature of the ligands around the metal and help guide the design of inorganic complexes that mimic the active site. Insight into enzymatic mechanisms can be obtained from spectroscopic studies with substrate analogs and inhibitors, along with isotope labeling experiments and kinetic investigations that employ stop-flow, freèze-quench and cryoenzymological techniques. Larry and his group also study model reactions in order to understand in more detail the enzyme-catalyzed reactions.

Currently, Larry and his group are studying oxygen activation in non-heme iron systems and metal-oxo clusters in proteins. A number of non-heme iron enzymes are known which activate molecular oxygen and catalyze the oxygenation of various substrates. These enzymes participate in important processes such as the conversion of methane to methanol, the metabolism of aromatic compounds, and the biosynthesis of penicillin and prostaglandins. Although this type of chemistry is beginning to be understood for heme proteins, much less is known of the iron enzymes which do not contain porphyrin ligands. Larry and his group are studying how these non-heme iron enzymes work, and to what extent their mechanisms resemble those of the heme systems. In parallel with the enzyme studies, ligands are being designed and synthesized which are resistant to oxidation and whose corresponding metal complexes combine with dioxygen and carry out the oxidative reactions. Taken together, the biochemical and biomimetic information that emerges should provide a more complete description of the chemistry at the enzyme active site.

Materials Chemistry at Minnesota

The merging of diverse and previously unrelated disciplines is an exciting and challenging part of science, and it comes as no surprise that interdisciplinary research often forms the cutting edge of new and developing fields. In the fall of 1989, the Department of Chemistry formally initiated a novel Ph.D. program in materials chemistry which brings together faculty and students from all of the traditional specialty areas of the department, and provides an environment which fosters the pursuit of non-traditional and interdisciplinary subjects across all of chemistry.

In order to accommodate a wide range of student interests without the institution of new courses, a committee consisting of **Paul Barbara**, **Peggy Etter**, **John Evans**, **Wayne Gladfelter** and **Tim Lodge** put together a program of study which forms new combinations of *existing* courses in such a way as to allow both the breadth and specialization necessary for materials related research. Courses were categorized into three distinct programs of study: 1) characterization, structure, and analysis, 2) synthesis and materials preparation, and 3) theoretical and quantitative approaches. Materials chemistry students select, in consultation with their advisors, which of these areas will be designated as primary, secondary and tertiary areas of concentration. They then choose three, two, and one, courses from each of these areas, respectively. Two additional courses outside the Chemistry Department must be chosen from an approved list, thus completing the "core course" requirement. The Ph.D candidacy exam is based upon a dossier which is submitted near the end of the spring quarter of the second year, thus ensuring early involvement with a research problem. The oral consists of presentation of research progress and a plan of attack for the thesis problem, as well as the usual question and answer period pertaining to general preparedness.

In addition to creating new links between groups within the department, the program has strengthened ties with other departments in IT, as well. Currently, students in the materials chemistry program are participating in projects involving groups from Chemical Engineering and Materials Science, Electrical Engineering, Physics, and Mechanical Engineering. These collaborations have accelerated the students' professional growth through involvement in team research with individuals from other disciplines. Indeed, many students and faculty have commented on the value of the exchange of ideas and resources that such interactions have initiated. Industrial support for the program is high, not only by virtue of the more applied nature of some of the research, but also because the cooperative, multifaceted approach to problem solving is advance training for the research environment in many company research facilities.

Among the current projects in materials chemistry are studies of the role of precursor molecular structure on the kinetics and mechanism of thin film chemical vapor deposition (**Wayne Gladfelter** and **John Evans**), molecular level spectroscopic and micro-mechanical investigations of the adhesive bond formed between polymers and metal oxide surfaces (**John Evans** and **Matt Tirrell**, Department of Chemical Engineering and Materials Science), diffusion of linear and star polymers in gel matrices (**Tim Lodge**), dynamic properties of block copolymers (**Tim Lodge**), and intermolecular phenoma which influence cocrystallization in organic systems (**Margaret Etter**).

Message from the Editors

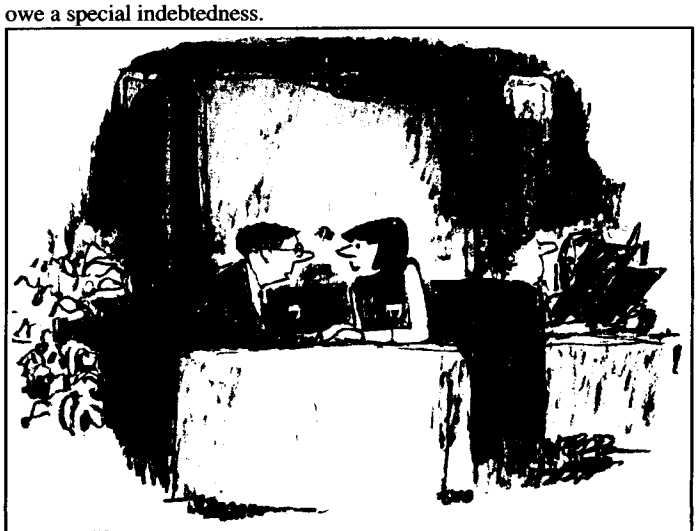
George Barany and Ken Leopold

A friend of ours has a summer home on the shores of Lake Michigan, where throughout the night, every hour on the hour, the foghorn from the old lighthouse reliably emits its plaintive wail. Of course, our friend sleeps soundly through it all. One particularly oppressive night, there was a power problem, and at 4:00 A.M., the horn did not blow. Startled, our friend woke up, exclaiming "What was that?"

The point of this anecdote may be all to obvious to some of our more faithful readers. The present mammoth edition of the *Minnesota Chemists Newsletter* compensates for our absence since Summer, 1989. The reasons for the delay, which occurred despite our best intentions, are ultimately too irrelevant to elaborate on at this time. However, we must confess our gratification at how keenly some of you missed us and thank you for your patience. We hope that this issue makes the wait just a bit more palatable.

In keeping with a national trend, the Chemistry Department has over the past few years revitalized its ever-strong commitment to education at all levels, a theme mirrored throughout this newsletter. The clarion call for the chemical profession was sounded repeatedly by our Regents' Professor **Paul G. Gassman**, who is just now concluding the three year cycle as American Chemical Society President. Relevant activities sponsored by our department run the gamut from outreach programs for grade school, Chemistry Day lectures and exhibits directed at high school students and teachers, symposia for undergraduates, and career development workshops for graduate students and postdoctorals. With the leadership of Department Chair **W. Ronald Gentry** and Ombudsperson and Women's Advisor **Susan R. Damme**, we have been very active in nurturing opportunities in chemistry for women and minorities. We hope that you will be inspired as you learn some of the details in the pages that follow.

We also bring you the usual regular features, as well as articles on topics of recent or current interest. Many people contributed significantly to the writing and data gathering contained herein, including **Rodney Biltonen**, **Peter Carr**, **Margaret Etter**, **John Evans**, **Gary Gray**, **Tom Hoye**, **Maurice Kreevoy**, **Alden Mead**, **Wayland Noland**, **Louis Pignolet**, **Christine Lundby**, **Stephanie Miller**, **Gladys Olson**, **Sue Page**, and **Suzanne St. Germaine**. We thank them all. As in past years, the job of the editors was made exceptionally easier due to the herculean efforts and impeccably good judgement of **Kathy Ross**, to whom we owe a special indebtedness.



"I think I can make you very happy if I can get funded."

Drawing by Weber; ©1989
The New Yorker Magazine, Inc.

Paul Gassman: ACS President

Friday, January 5, 1990 is a day that Professor **Paul G. Gassman** of our department won't soon forget. By proclamation of Governor **Rudy Perpich**, that day was known throughout the state of Minnesota as "Professor Paul Gassman Day." Some two hundred persons, including University colleagues and administrators, representatives of the industrial sector, government, and the media, and quite of few of Gassman's nearly 150 present and former coworkers, came together that afternoon at the Hubert H. Humphrey Institute for a reception and ceremony to mark the-man-of-the-hour's assumption of leadership of the American Chemical Society. The ACS, with its membership in excess of 140,000 people, professional staff of about 2,000, and $180 million budget, is the largest professional society in the world. Gassman's presidency, for calendar year 1990, marked the middle year of a three year cycle of elected office. The society was represented by its executive director, **John K. Crum**, and its then president-elect, **Allen Heininger**. Also in attendance was **Michael Heylin**, editor of *Chemical & Engineering News*.

Among the speakers were **Nils Hasselmo**, president of the University of Minnesota, **Ron Gentry**, chair of the Department of Chemistry, **Julie Prager**, formerly of 3M, **Tony Andersen**, chief executive officer of the H. B. Fuller Company, **Jack McKenna** of St. Cloud State University, Governor **Rudy Perpich**, and Lieutenant Governor **Marlene Johnson**. Particularly touching remarks were made by **Lois Fruen**, president of the Minnesota Science Teachers Association, whose brother, **John Granrud**, earned his Ph.D. with Gassman in 1981 and was killed in a tragic boating accident two years later. The meeting was convened by **Art Coury**, of Medtronics, Inc., who is chair of the ACS Minnesota Section.

In his talk, Gassman stated his major agenda: to address his concerns about the educational process and the future of science and technology in the United States. An increasing portion of the American population is scientifically illiterate, Gassman explained with several examples. He continued, "It is clear that as a nation, we have failed dramatically to educate our citizens. We have serious educational problems at every level from preschool through the continuing education of adults. These failures represent an educational and economic time bomb." Entering the twenty-first century, this country faces shortfalls in Ph.D. chemists, secondary school teachers, and college and university faculty. Gassman called for major government initiatives, "if we are to graduate as many U.S.-born Ph.D. chemists in the year 2010 as we did in 1985. Achievement of such a goal will require far greater involvement in the sciences by women and minorities."

The cost of doing research and the approach to the funding of scientific inquiry is another critical concern, Gassman warned. "Our universities are supposed to be our bastions of original thinking and original doing." Unfortunately, these have become costly. "Unless we are able to build a strong triumvirate of funding partners for scholarly activities consisting of the federal government, state governments, and the industrial sector, we will certainly fail to retain our strong world wide technological position in the early 21st century. *The time to act is now.*"

Gassman made several concrete proposals during his address, and noted ruefully that, "I hope I have not sounded too dismal on this festive occasion." He ended by praising his research collaborators over the years, and lastly, he thanked his wife Gerda. A warm ovation brought the afternoon's formal program to a close.

In addition to serving as ACS president, Professor Gassman has been active on the Board of Directors, the Board Committee on Public Affairs and Public Relations, the Society Committee on Publications, the Board Committee on Planning, the Committee on Committees, and the Council Policy Committee of the Society. As if that were not enough to keep a person busy, his other activities include service on the Board of Directors of the National Foundation for History of Chemistry, the Council of Scientific Society Presidents, and the US National Committee for the International Union of Pure and Applied Chemistry.

State of Minnesota

Proclamation

WHEREAS: The American Chemical Society is the largest professional scientific organization in the country, with over 100,000 members, of which nearly 2,000 are in the Minnesota Section; and

WHEREAS: Professor Paul Gassman of the University of Minnesota is the new president of the American Chemical Society, and began his term of office on January 1, 1990; and

WHEREAS: Professor Paul Gassman has also been elected to the National Academy of Science, and has been appointed a Regents' Professor at the University of Minnesota; and

WHEREAS: The local section of the American Chemical Society is sponsoring a reception for Professor Gassman, on January 5, to celebrate his selection as President, the first president of the American Chemical Society in Minnesota in 50 years; and

WHEREAS: One of Professor Gassman's main concerns as President is the education of students in the area of science; it is his belief that many more students need to take up science as a profession in order for this country to compete in the 21st century; and

WHEREAS: We are proud to have Professor Paul Gassman represent the state of Minnesota as he begins his tenure as the president of this important national organization;

NOW, THEREFORE, I, Rudy Perpich, Governor of the State of Minnesota, do hereby proclaim January 5, 1990, to be

PROFESSOR PAUL GASSMAN DAY

in Minnesota.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of State of Minnesota to be affixed at the State Capitol this fourth day of January in the year of our Lord one thousand nine-hundred and ninety, and of the State the one hundred thirty-first.

(signed by Rudy Perpich)

Governor

(signed by Joan Anderson Growe)

Secretary of State

(Letter from page 1)

The University of Minnesota has one of the strongest chemistry programs in the country. With the continuing support of our friends, we can maintain the momentum in our teaching and research activities which will carry us into the new millennium—a future which is bound to be filled with opportunities to enrich our lives through new discoveries and applications of chemistry. As you look through this Newsletter, please feel free to tell us what you like about our programs and activities, and to offer suggestions for improvements. I would personally be very happy to hear from you either by letter or telephone at 612-624-6000.

Ron Gentry

1990 Minisymposium in Chemistry

On Saturday, November 3, 1990, the Department hosted regional college chemistry faculty and students and industrial research scientists at its fourth biennial Minisymposium in Chemistry. This edition of the symposium consisted of research presentations by five of our faculty, a poster session presenting the work of our graduate students and postdoctorals, and tours of our laboratory, instrumental, and service facilities.

The speakers at the symposium and the titles of their lectures were as follows: Professor **Louis Pignolet**, "The Chemistry of Large Metal Clusters Which Contain Transition Metal to Gold Bonds;" Professor **Kenneth Leopold**, "Probing the Nature of Intermolecular Interactions: Structure and Dynamics of Weakly Bound Systems;" Professor **Marian Stankovich**, "How is Fatty Acid Metabolism Switched on at the General Acyl-CoA Dehydrogenase Control Point?;" Professor **Scott Rychnovsky**, "Synthesis of Polyene Macrolide Antibiotics;" Regents' Professor **Paul Gassman**, "Cycloaddition Reactions of Allyl Cations–The Ionic Diels-Alder Reaction."

Aside from providing an opportunity for scientific exchanges, which is always enjoyable, the symposium also provided an opportunity for members of the Department to keep in touch with chemists and students of chemistry in the region. As judged by the attendance and the many positive comments we received, the symposium was indeed a success.

(Reaches Out from page 1)

The department's outreach activities have not been limited to trips to local schools. For each of the past two years, the department has hosted a day-long event which we call Chem Day. The first event was held on National Chemistry Day, Saturday, November 4, 1989 (this is the culmination of National Chemistry Week, a biennial observance sponsored by the American Chemical Society). Chem Day 1989 included a morning symposium and science-fair type competition for high school students and their teachers, a lunch for all 600 participants, and an afternoon open house and exposition for the general public. The morning symposium included talks by leading chemists and educators. Professor **Paul Gassman**, Department of Chemistry, University of Minnesota, presented a talk on "Chemistry–a Fantastic Future." Professor **Margaret Etter**, also of the Department of Chemistry, University of Minnesota, spoke on "Snowflakes, Crystals and Organic Chemistry." Professor **Truman Schwartz**, Department of Chemistry, Macalester College, and Chair of the Division of Chemical Education of the American Chemical Society (ACS), presented a demonstration/ lecture entitled "Learning by Doing: the Sights, Sounds and Smells of Chemistry." The afternoon show featured exhibits by many local companies and colleges, career information, numerous demonstrations, and tours of the department's research facilities. The occasion, which was organized by **Lou Pignolet**, **Stephanie Miller**, **Hal Swofford**, **Kent Mann** and **Pete Carr**, was such a success that plans were implemented to make Chem Day an annual event.

The second annual Chem day, which was held on Saturday, January 12, 1991, was similar in format to the original show, and drew a crowd of about 700. The morning program for high school students and teachers featured the Larry Conroy Memorial Lecture (see accompanying article, page 8), given this year (complete with demonstrations) by Professor **Harry B. Gray**, the Arnold O. Beckman Professor of Chemistry at the California Institute of Technology. Professor Gray is a world-renowned chemist, a leading educator in the United States, and is this year's recipient of the Priestley Medal, given for distinguished service in chemistry and, as such, the most prestigious award given by the ACS. Also on the morning program was a talk by **Dave Dahl**, head meteorologist of local television station KSTP, who spoke on "The Chemistry of Minnesota Weather." In addition to talks, demonstrations, and insights into career opportunities, a number of door prizes were awarded, including tee-shirts, (*Chemist Have Solutions*, a Chem Day design), handwarmers, and periodic tables. Credit for organizing this event goes to **Lou Pignolet** and **Stephanie Miller**, with **Pete Carr**, **Wayne Gladfelter**, and **Kent Mann**.

Transition State

PROMOTIONS

George Barany was promoted from associate to full professor in the spring of 1991. His association with the department dates from 1980, when he joined the faculty after receiving his Ph.D. from Rockefeller University. George's research is in the area of bioorganic chemistry, more specifically on the development of new methods for the chemical synthesis of peptides. A "hobby" of his is organosulfur chemistry, as exemplified by his widely publicized synthesis of the active ingredient in garlic.

Tom Hoye was promoted from the rank of associate to full professor in the spring of 1989. Tom joined the faculty in September of 1976 as an assistant professor, fresh from his Ph.D. at Harvard University a few months earlier. Tom's main chemical interests are in the development and application of synthetic methodology and concepts to natural product total synthesis. He is also interested in symmetry properties, organometallic chemistry, structure determination, NMR, and mechanistic studies of transition metal carbene chemistry. Tom has just completed a three year stint as the director of graduate studies for the department.

Paul Barbara, who joined the faculty in 1980, was promoted in the spring of 1990 from associate to full professor. Paul received his Ph.D. from Brown University in 1978 and completed a postdoctoral appointment at Bell Labs. Paul's principal research interests include organic photochemistry and photophysics as well as ultrafast spectroscopy in solution and the gas phase, especially with regard to proton transfer and electron transfer reactions and non-linear optics.

Margaret Etter was promoted from associate to full professor in spring, 1990. Peggy joined the faculty as an assistant professor in 1984. She earned her Ph.D. from Minnesota in 1974, having worked with Jack Gougoutas. While she was away from the department, she was employed at 3M, and immediately prior to joining our faculty she was involved in postdoctoral research with Robert Bryant . Peggy served as vice-chair of the department during the 1989-90 academic year. Her major research interests are in solid state organic chemistry, including solid state NMR, crystallography, hydrogen bonding phenomena in the solid state, and reactions in the solid state.

John Evans was promoted from associate to full professor in the spring of 1990. John got his Ph.D. from the University of Delaware, with an award date of June, 1977. He conducted postdoctoral studies as a visiting research associate at Ohio State in 1976 and 1977, and joined our faculty in 1977. John's main scientific interests are in surface thin film deposition and analysis. He is also very involved in materials chemistry, polymer surface interactions and metal oxide surface chemistry. He has been coordinator of the new materials chemistry specialty area and is currently departmental vice chair.

Tim Lodge,who joined the faculty of chemistry in 1982, was promoted from associate to full professor in spring, 1991. Tim's graduate work was at the University of Wisconsin, and after his 1980 Ph.D. there, he did postdoctoral work at the National Bureau of Standards. Tim works on the dynamics of polymer liquids, using birefringence and scattering techniques. He chaired the department's planning, staffing and resources committee from 1988 to 1991.

Kent Mann was promoted from associate to full professor in the spring of 1990. Kent received his Ph.D. from Cal Tech, where he was an NSF fellow, in 1976. He joined the faculty at Minnesota in 1978. Kent's main interests are in physical inorganic chemistry and photochemistry. He has concentrated on the photo- and electrochemistry of transition metal complexes and photoredox catalysis by transition metal systems. Kent is presently serving as the first director of undergraduate laboratories, a newly created and very important position in the department.

Hung-Wen (Ben) Liu was promoted from assistant to associate professor in the spring of 1990. Ben joined our staff in 1984. His Ph.D. was in 1981 from Columbia, and he was an NIEHS postdoctoral fellow at MIT prior to joining our staff in 1984. His main area of research is bioorganic chemistry. He has contributed to our understanding of the mechanism of enzyme action, the biosynthesis of unusual sugars, immunochemistry of macrophages, and carbohydrate chemistry.

RETIREMENTS

Robert Hexter retired in June of 1991. Raised in Minneapolis and St. Paul, he earned his Bachelor's degree at Minnesota in 1948 and returned as department chairman in 1968. During the intervening 20 years, he had earned his Ph.D. at Columbia in 1952, spent five years as instructor and assistant professor, and enjoyed twelve productive years as senior fellow of the Mellon Institute and adjunct professor of chemistry at Carnegie Tech (upon the merger of the latter institutions, he became a professor of chemistry at Carnegie-Mellon). He views as the principal achievement of his chairmanship here the recruitment of 14 new faculty members, six of whom are now senior professors in the department. In 1975, Bob returned to full-time teaching and research.

Bob's scientific career has been marked by numerous research achievements and conceptual advances in vibrational spectroscopy. His seminal work on the spectroscopy of metal surfaces was in part responsible for the award, in 1979, of one of only 14 NSF Regional Instrumentation Facilities. Bob served as co-director from the inception of the Minnesota facility for surface analysis. Author of more than 50 papers, Bob is most proud of the monograph "Molecular Vibrations in Crystals," which he co-authored with J.D. Decius of Oregon State University. Both at Carnegie-Mellon and at Minnesota, Bob served his departments and the greater university and metropolitan communities in many ways–too many to enumerate here. During his career he was the recipient of a number of honors and awards, including Guggenheim and Fulbright Fellowships, but his grandest awards are his six grandsons!

As this issue of the *Minnesota Chemists Newsletter* was being readied for press, we were all saddened by the death from cancer of Bob's life partner, Norma Hexter. The Hexters had been married for 43 years, and had been looking forward to travel together throughout the world during the retirement years.

Rufus Lumry retired in June of 1991, after an association with chemistry at Minnesota dating from 1953 when he joined the faculty as associate professor of chemistry. Born in Bismarck, North Dakota, into a family in the agricultural business, he graduated from Harvard College in 1942 with a B.S. in chemistry. He contributed three years to the war effort by becoming what the English called a "boffin," a backroom scientist with a love for explosions. At the war's end, he was attached to the staff of General MacArthur. He then returned to Harvard and became a graduate student in the laboratory of George Kistiakowsky. He received his M.S. in physics and his Ph.D. in chemical physics the same year, 1948. His postdoctoral work was with Henry Eyring and Emil Smith in the nascent protein group at the University of Utah.

Rufus's research has centered on the study of proteins in solution, and it has been his role to be a pathfinder in protein chemistry. His concerted efforts found their greatest usefulness in the yearly invitational La Cura conferences, 1963-76 (with Rufus as one of the principal organizers) and in the successful introductions of a whole succession of new concepts in protein chemistry. He has travelled widely and held visiting professorships in the United States, Europe and the Far East. A symposium honoring Rufus on the occasion of his birthday is described in an

accompanying article (see page 17). Rufus has been a good colleague, and has delighted us all with his offbeat sense of humor and charming eccentricities. Fortunately, Rufus continues to come in daily and work as hard as ever at science.

Stephen Prager retired from the department in June, 1990, having rendered distinguished service to the department since 1952. Steve was the founder of the theoretical chemistry group at Minnesota, which now numbers seven faculty, but which at the outset was regarded as something rather unusual and not necessarily desirable in a chemistry department. Steve's early and continuing achievements certainly did much to pave the way for the growth and prosperity of the discipline here.

Steve made many important contributions to theoretical chemistry, mostly in statistical mechanics, but also in molecular quantum mechanics and other areas. Throughout his career, Steve was renowned as an outstanding teacher at all levels of physical chemistry. His teaching was characterized not by flamboyance, nor by the currying of favor by sweeping difficulties under the rug, but by absolute honesty, clarity, and thoroughness.

Steve and his wife Julie, recently retired from 3M, have many friends in the department, who look forward to further years of association with them. To show its esteem, the department honored Steve on October 12–13, 1990, with a two day "Pragerfest" (see accompanying article, page 15).

Warren Reynolds retired in spring 1991, after 37 years of service to the teaching and science professions. He was born in Gull Lake, Saskatchewan, and contributed over four years to his country in the Royal Canadian Air Force. He earned his Bachelors and Masters degrees from the University of British Columbia in 1949 and 1950, respectively. His Ph.D. work was completed here at Minnesota under the direction of Professor I. M. Kolthoff, with the degree granted in 1955.

Warren's research has been in many areas of transition metal chemistry, with a particular interest in the mechanisms of electron transfer reactions. He is author or co-author of over 100 research publications and has been advisor to numbers of undergraduate as well as graduate researchers and postdoctoral fellows. He has been an excellent teacher of inorganic chemistry at both the undergraduate and graduate levels, and has regularly taught introductory courses in general and analytical chemistry. The quality of his teaching was recognized in 1984 when he was chosen to be one of the developers of the Institute of Technology Honors Chemistry program, a "community of scholars" kind of approach now offered regularly to top freshmen. We hope that Warren and his wife, Rose, will now find the time to do all of the things they have ever wished to do.

Archie Wilson decided to retire effective June of 1989. Archie was born in Tekoa, Washington, grew up in Portland, Oregon, and enrolled at Iowa State College in 1939. He continued his schooling until he joined the Manhattan Project in January of 1943. For the next three and a half years, he was a research associate carrying out X-ray diffraction studies of solid structures with the late Professor Robert E. Rundle. In 1946 he was selected to participate in a special graduate studies program of the U. S. Army Quartermaster Corps and was commissioned a 2nd lieutenant. He received his M.S. and Ph.D. degrees in 1950 and 1951, respectively, under the direction of Professor Henry Taube (Nobel Laureate in Chemistry, 1983). From 1950 to 1951 he was an instructor in chemistry at the University of Nebraska, and in 1951 he joined the General Electric Company as a research chemist at the Hanford Laboratories in Richland, Washington. In 1971, Dr. Wilson was appointed professor of chemistry at the University of Minnesota, and he also served as associate chairman of the department from 1971 to 1978.

Archie authored or co-authored 57 technical communications in the X-ray determination of solid structures, ruthenium chemistry, plutonium processing, solvent extraction of the actinide elements, computer techniques for indexing X-ray powder patterns, and chemical education. He also holds four patents in the processing of nuclear fuels. Throughout his career, Archie always generously contributed his time to many activities related to his profession, including his talented editorship of this newsletter. Archie and Ivon will spend the retirement years in Edmonds, Washington, near their three children, Andrea, Ronald and Steve, all of whom reside in Washington State.

Vernon R. Petersen began employment in the department in April of 1967, in the position of storehouse stock clerk in the undergraduate teaching laboratories. The duties of this position included maintenance of these laboratories as well as the stockroom. Vernon was later promoted to principal laboratory attendant, where he was responsible for a number of teaching laboratories and stockrooms. In that position, Vernon made a number of contributions to stockroom processes including the development of a new check-in procedure for students and a new computerized numbering system for stock items in the main stockroom. Vernon's developments continue to be used routinely in the department. Vernon was later promoted to laboratory services coordinator, the position he held upon his retirement in August of 1988. In this position he was responsible for setting up demonstrations for use by faculty members in their lectures. He also assisted in the development of many new demonstrations enriching the lectures of thousands of undergraduate students. Vernon also improved the method of making slides for lectures and seminars and implemented a system of producing glossy prints for research publications.

Vernon lives in Crystal with his wife Marjorie and continues to lead an active and busy life. He enjoys writing, both fiction and essays, and he is president of the north Minneapolis chapter of the Izaak Walton League of America for which he writes and edits a monthly newsletter. Throughout his career in the Chemistry Department, Vernon always worked to improve every job for which he was responsible. He always subscribed completely to his personal philosophy on work, namely that "you show up a high percentage of the time and do the best that is in you each day." We express our deep appreciation to Vernon for over two decades of exemplary contributions to the department, and wish him and Marjorie a full and happy retirement.

Gaylord (Pete) Peterson is a native Minnesotan, having been born in Clarissa in 1923. After graduating from high school in 1941, Pete attended a vocational-technical institute and graduated in 1942. From there he went into the U.S. Army Air Corps for the duration of World War II, serving as a radioman in B-29 bombers. Pete began his association with the University of Minnesota in 1946, when he joined the physics shop as a machinist. After eight year's employment in the physics shop, he left the University to work for several local companies, including Research, Inc., Honeywell, and Univac. In October, 1970, he returned to the University and the Institute of Technology when he joined the Chemistry Department as the supervisor of our machine shop. He served for eighteen years in that capacity, providing skills and expertise that have been invaluable to a large number of research and teaching projects.

Pete retired in December, 1988, and his departure has left a void. The combination of high technical skill in his job, outstanding professionalism as a supervisor, and a friendly, outgoing personality are clearly missed in the machine shop and throughout the whole department. Pete and his wife Betty now live in St. Louis Park. They enjoy travelling and plan to do much more of that during their retirement years. His colleagues and friends in the Department of Chemistry wish him and Betty a long, joyous, and exhilarating retirement.

(Transition to page 11)

Larry Conroy Memorial Lecture Series

An annual lecture series in honor of Professor Larry Conroy was initiated in 1989 by the area high school chemistry teachers group. Larry was a professor of chemistry at the University of Minnesota from 1959 until his untimely death in April, 1988. His research was in solid state chemistry, and just before his death he was making important contributions in the synthesis of low temperature superconducting materials. During his years at the University of Minnesota, he also devoted much of his time to chemical education. Professor Conroy was the Director of Undergraduate Studies in the department from 1966 to 1968, and taught at all levels from general chemistry to graduate courses. In 1963, he was co-author of a laboratory manual that was used for over twenty years in the general chemistry program. He also worked to improve chemistry teaching at the pre-college level, offering a course in chemistry concepts for junior high school teachers, actively working with various high school teachers groups, and acting as the Minnesota coordinator for the International Chemistry Olympiad competition. Larry's love and concern for teaching naturally led him to interact with the area chemistry teacher's group–an interaction he truly enjoyed. The high school teachers gained significantly from his ideas about teaching and from his enthusiasm for chemistry, and have honored him accordingly by establishing a lectureship in his memory.

The first event was held on January 17, 1989, and was organized entirely by the area high school chemistry teachers group. It featured **Fred Jurgens**, from the University of Wisconsin, Madison, who is very well known for his interesting lecture demonstrations. His talk, entitled "Freezing Hot and Boiling Cold," was such a success that the lecture was made an annual event. The area chemistry teachers group was pleased about the positive response from the department and the number of faculty who attended, and contacts were made which continue to result in profitable associations.

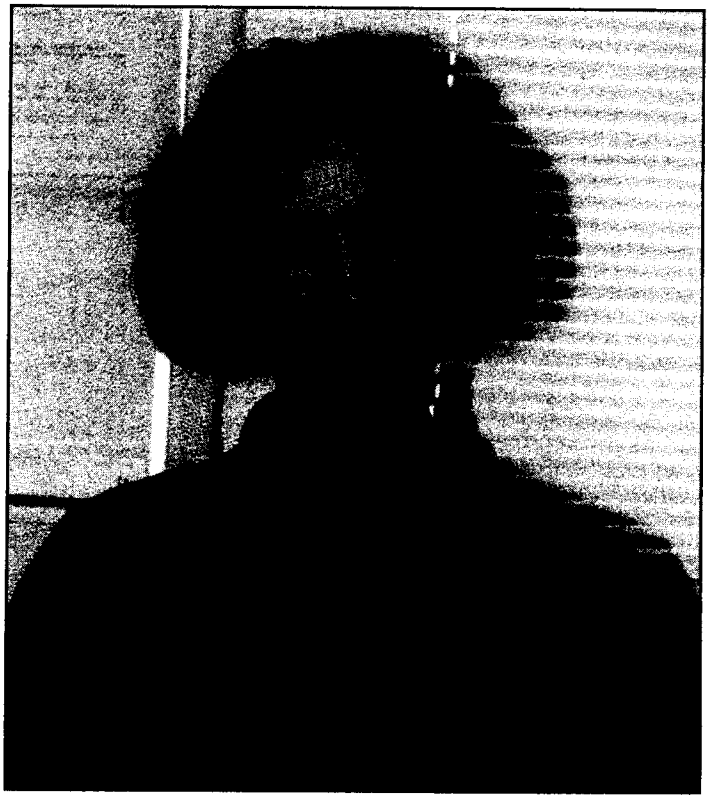
The second annual lectureship was held on February 17, 1990, and began with introductory remarks by University of Minnesota President **Nils Hasselmo**. The program consisted of, first, a lecture by Professor **Wayne Gladfelter** of the Department of Chemistry, University of Minnesota, entitled "How Do You Build Metal Films 100 Times Thinner Than a Gnat's Eyebrow?" The second part of the program was a demonstration by Dr. **Richard Ramette** of Carleton College, entitled "THE WINKLER AWARDS-Best Performances by Chemical Elements." The 1990-91 academic year's Conroy Memorial Lecture was incorporated into Chem Day (see article, page 1).

NSF Recognizes Pioneering Efforts of Women's Advisor

In August, 1990, the National Science Foundation awarded $64,000 to the Department of Chemistry in support of their innovative proposal "*An Environmental Approach to Enhanced Retention and Recruitment of Women and Minorities in Chemistry, A Pilot Study.*" This proposal, written by **Susan Damme** (Women's Advisor and Ombudsperson), the Equal Opportunity Committee members (Professors **Marian Stankovich**–committee chair, **Paul Barbara**, **John Evans** and **Gary Gray**, and **Emi Ito** from the Department of Geology and Geophysics), and Chair **Ron Gentry**, is a one-year grant to study and implement measures to provide an environment where "affirmative action and equal opportunity thrive." One of the goals of the proposal is to develop a pilot project which will be transportable to academic departments in science and engineering both locally at the University of Minnesota as well as nationally.

The proposal grew out of a departmental restructuring and refocussing effort which was formalized in August of 1989. At that time the new office of Women's Advisor and Ombudsperson was created to address gender and diversity issues. Susan Damme was hired for the position after an extensive search for just the right person. Susan has an M. A. and B.A. in psychology from the University of North Dakota. She had held positions in private practice, in teaching with an accent on team-building and women in management, as a leadership training manager, and as an organizational development consultant. Currently, she is also working toward a Ph.D. in education, with an organizational development focus, at the University of Minnesota. Susan brings to the department her refreshing sense of humor and special skills in advising and program planning, and mixes them with with a keen understanding of women's issues and non-traditional career paths.

(NSF to page 15)



Sue Damme

Ovations

Honors and awards are one way of measuring successes in our chosen professions. We are proud to relate the accomplishments of the faculty and staff who received the following recent accolades.

Professor **Paul Barbara** received the 1989-90 George Taylor/IT Alumni Society Award for Research, for outstanding ability in research. This all-University award is supported by the Minnesota Alumni Association, and three awards are given each year for contributions in the categories of research, teaching, and service.

Professor **Peter Carr** received the Benedetti-Pichler Award of the American Microchemical Society, presented at the 1990 Eastern Analytical Symposium in November of that year.

Regents' Professor **Paul G. Gassman** was elected to membership in the prestigious National Academy of Science in 1989. He was the 1990 recipient of the Chemical Manufacturers Association National Catalyst Award, reflecting outstanding contributions to teaching. He received an honorary Doctor of Science degree from John Carroll University at their commencement ceremonies in Cleveland, Ohio on May 28, 1989. He was also the recipient of a 1990 Chemical Pioneer Award from the American Institute of Chemists, in recognition of his work in "establishing the existence and mechanistic significance of divalent positively charged nitrogen as reactive intermediates," and being the "first to propose the existence of 'twist' bent carbon-carbon sigma bonds." More recently, he was awarded the President's Medal of Canisius College, 1991 (please accompanying article, page 4).

Professor **Edward Leete** received the Minnesota Award, given by the Minnesota section of the American Chemical Society every three years, in recognition of his distinguished forty year career in teaching and research. Ed also was the first recipient of the Phytochemistry Medal and Prize, sponsored by the journal *Phytochemistry*. Leete and Professor Emeritus **Archie Wilson** were elected fellows of the American Association for the Advancement of Science. Leete's citation was "for studies of the biosynthesis and metabolism of secondary natural products produced by plants, microorganisms, and insects." Wilson was cited "for research in the chemistry of the constituents of irradiated nuclear fuels, for teaching, and for academic administration."

Professor **Doreen Leopold** received the 1990 American Society for Mass Spectrometry (ASMS) Research Award for young mass spectrometrists, including a monetary award in support of her research.

Professor **Hung-wen (Ben) Liu** received a Research Career Development Award from the National Institutes of Health, a five-year award starting in July, 1990.

Professor **C. Alden Mead** was elected a fellow of the American Physical Society, "for contributions to the theory of line shapes, the optical properties of materials, molecular spectroscopy and nonequilibrium statistical mechanics."

Professor **Louis H. Pignolet** was awarded a 1989-90 Horace T. Morse–Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education, for distinguished service to the instructional programs of the University.

Professor **Scott Rychnovsky** garnered a series of awards in national competitions: a Searle Scholar grant in 1989, a Camille and Henry Dreyfus Teacher-Scholar Award in 1990, and a 1991 Presidential Young Investigator Award from the National Science Foundation, recognizing research and teaching accomplishments and promise for future leadership. Scott was also named a McKnight-Land Grant Professor during 1990. In the first four years of this last-mentioned internal award program, which provides research support for the three years of the professorship as well as optional teaching relief, Chemistry's nominee (one allowed per department for a total of 50–125 nominees) has been chosen each time as one of the overall seven to nine recipients. Previous winners were **Steven Kass**, **Doreen Leopold**, and **Kenneth Leopold**. In 1991, Professor **Jeffrey T. Roberts** was so selected, so Chemistry's record continues. Jeff also received a Camille and Henry Dreyfus New Faculty Award, a national award to junior scientists at the beginning of their academic careers, based upon scientific achievement.

Temporary faculty member **Guang-Ming Xia** was named Best Professor in the Chemistry Department by the IT Student Board in 1989-90. This is a true barometer of student appreciation, since selection is based entirely on student polls. Professor **Wayne Gladfelter** was selected Best Chemistry Professor in 1990-91.

Staff members, too, have earned recognition. Undergraduate operations coordinator **Stephanie Miller** won a 1989 Gordon L. Starr Award from the Minnesota Student Association for outstanding contributions to student life. The recently established Institute of Technology Civil Service Outstanding Service Award program, announced in the last issue of this newsletter, has honored more staff members from Chemistry than from any other IT department. Our 1989 outstanding civil servants were **Edmund A. Larka** (Scientist), **Mary Jane Lewis** (Executive Secretary), **Sue Page** (Principal Student Personnel Worker), and **Kathy Ross** (Executive Secretary). Award recipients for 1990 were **Flurnia Hadley-Davis** (Executive Secretary), **Chris Lundby** (Principal Secretary), and **Cindy Mech** (Principal Accounts Specialist). In 1991, those honored were **Frank Dandl** (Maintenance and Operations Mechanic), **Ruth K. Granheim** (Principal Secretary), **Gary L. Holmbo** (Laboratory Services Coordinator), **Karl Lovgren** (Laboratory Machinist Specialist), **Victor R. Munsch** (Lead Stores Clerk), and **Mary A. Sende** (Principal Secretary). Congratulations to each and every one of our dedicated staff for their continuing valuable contributions.

1991 Outstanding Civil Service Awardees (left to right) Gary Holmbo, Ruth Granheim, Frank Dandl, Mary Sende, Karl Lovgren, and Vic Munsch

Careers in Chemistry

On March 31, 1990, the Department of Chemistry, in conjunction with the Institute of Technology, sponsored a one-day career planning workshop for graduate students at the St. Paul Student Center, St. Paul campus. Seventy participants discussed career opportunities in academia and industry, as well as such topics as how to balance family and careers. Discussions were led by a group of speakers and panelists from industry, academia, chemistry department alumni and faculty members, and career development and placement professionals. Dr. **Margaret Cavanaugh** of the National Science Foundation delivered the keynote address and spent several hours talking informally with women students and postdocs on a wide variety of professional development topics.

Subsequently, a panel on academic careers focussed on the contrasts between teaching and research in a large university setting and in smaller liberal arts colleges. The panelists were **David Boyd**, professor of chemistry at the College of St. Thomas, **Lynn Buffington**, professor of chemistry at Carleton College, **Lou Pignolet**, professor of chemistry at the University of Minnesota, and **Lynda Ellis**, professor of laboratory medicine and pathology from University of Minnesota Hospitals and Clinics. Concurrently, a panel on careers in industry met to relate their experiences in industrial settings. The panelists in this group were **Gaye Lehman**, 3M Company, **Claudia Poser**, formerly with 3M Company, **John Newman**, Evans Central, and **Chris Ryan**, H. B. Fuller Company.

After a lunch break, there was a choice of speakers. Institute of Technology Placement Director **Herb Harmison** presented a pragmatic, self-directed approach to career planning based on his 25 years of experience in university teaching and placement work. Chart/Wedco senior trainer **Marianne Yost** presented the *integrative life planning* model, a career planning process developed at the University of Minnesota.

The balance of the afternoon was devoted to panels, and again a choice was offered. An academic group, made up of **Emi Ito**, professor of geology at the University of Minnesota, **Larry Que**, professor of chemistry at the University of Minnesota, **Sandra Olmstead**, Augsburg College graduate student, and **Angie Ashton**, University of Minnesota graduate student, discussed the inherent problems and potential solutions in balancing family and career issues. Panelists reported on a variety of subtle, difficult-to-detect barriers that commonly obstruct the normal career progression for women. Industry managers **Dee Oliveira**, 3M Company, **Kurt Heikkila**, Aspen Research, and **Liz Westring**, General Mills, addressed the possibilities in combining chemistry with management roles. They described several routes to a career in management, pointing out that in some industries MBA's are the norm, while in others they are practically nonexistent.

The first workshop provided an opportunity for students to establish contact with chemists outside the University community and laid the groundwork for continued professional networking. The success of this offering was so encouraging that a similar program was presented on April 20, 1991. The panel approach was popular during the first workshop, and the only complaint was that since a choice was offered during the same time periods, those interested in both panels could only attend one. Thus, for the 1991 program, panels were offered in series, on industrial recruiting, the graduate school "career", success stories, and international collaboration.

The industrial recruiting panel, with **Pat O'Connor**, INCSTAR, **Leo Johnson**, H. B. Fuller Company, and **John DeVries**, General Mills, included diverse perspectives on interviews, plant visits, and the selection process from chemists and human resource representatives from industry. The graduate school "career" panel, made up of University of Minnesota personnel **Meg Brissenden**, **Florence Littman**, and **Tom Hoye**, offered guidelines and policies on benefits and working conditions of graduate students, including future plans for health care and child care. In the category of success stories, experiences and advice was given by current students **Susan Reutzel**, **Kim Johnson** and **Nes Rotstein**, and alumnus **Paul Christian**, who had all recently accepted jobs in industry. Finally, the panel on international collaboration provided perspectives on cooperative chemical research and its ramifications on international relations, from **Ron Caple**, a University of Minnesota, Duluth Chemistry professor and his Russian colleague **William Smit** from the Zelinski Institute for Organic Chemistry in Moscow. The career workshop will be an annual offering for our students, and will be varied from year to year so that students have a good basis for decisions near the end of their graduate careers.

A further result of the first workshop was to highlight an interest in information on academic careers among our present graduate student population. To address this need, a series of pizza seminars were arranged, with faculty, postdoctoral, and graduate students participating. About 30 people met in twelve sessions, covering a wide range of topics in academics. During fall, the meetings centered on finding the right academic position, including: schools–what type of school is for what person, and differences and similarities in the various settings; the job search–how information on availability is disseminated, resumé preparation, including the research précis, and interviews–what can be expected, what one can ask for, and what they are looking for; and finally, seminars–preparation and presentation.

During winter and spring quarters, the focus shifted to writing proposals for funding, and the specifics of teaching. The participants discussed the nuances of the "funding game," including tricks to improve the chances for funding, and the differences between the agencies. The teaching seminars turned out to be the most popular of all, and topics included preparation, choosing a text, writing exams, grading, what to expect from other faculty, time management (dividing time between teaching and other responsibilities), and cooperative teaching in undergraduate chemistry classes. The last two sessions were spent taking a contemporary look at freshman chemistry and actually designing a course based on theory and practice covered in the earlier meetings. These workshops, too, proved to be so useful that we hope to continue them on an annual basis. The department has received a $1,200 grant from the University's Office of the Vice President for Student Affairs, through their Small Grants Program for Community Building, for a 1991-92 series.

Sabbaticals

The concept of sabbatical furlough has historically been integral to the academic setting, and many private settings are now incorporating similar programs in recognition of the multiple benefits of such an opportunity for scholarship. The very word has roots which connote its objective of rest and renewal, and even the custom of a seven year cycle of eligibility dates back to ancient Judea, where every seven years the vineyards and fields were allowed to rest from autumn to autumn without tilling, sowing, pruning or reaping, by Levitical commandment. However, modern sabbatical leaves incorporate activities ranging far wider than simple "*R & R*", from study and collaboration abroad to research or educational program development at home. We present here the details of faculty sabbaticals taken during the 1989-90 and 1990-91 academic years.

1989-90

Wilmer Miller spent his leave about as far from Minnesota as possible, at the Department of Physics of Massey University in Palmerston North, New Zealand. The theory of translational diffusion of rodlike polymers in the semidilute and concentrated regimes is extremely complex and there are virtually no good experimental data. While on leave, Wilmer spent much of his time collecting such data, using pulsed gradient spin echo NMR. In addition, he worked with NMR microscopy (magnetic resonance imaging done on a micro scale), and he will continue that work here. A major goal of his current work is to image the effect of shear fields on domain size in surfactant lamellar phases.

Larry Miller spent part of his time here and the rest at IBM Almaden Labs in San Jose, California. Larry reports that he was there during the quake. In true Miller style, he did not neglect the California beaches. Supported by IBM in the form of a Paul J. Flory Sabbatical Fellowship (one twelve-month fellow is named each year), Larry studied materials chemistry and the optical properties of thin films.

Marian Stankovich spent her sabbatical at the University of British Columbia in the Department of Biochemistry. Her leave was supported in part by a highly competitive award from the National Science Foundation through their Research Opportunities for Women Program. Marian's main goals while on leave were to learn the basic laboratory techniques of molecular biology and specifically to learn to clone and sequence the DNA code for butyryl-CoA-dehydrogenase. She reports that the sequence was obtained one day before returning to Minnesota.

Finally, two faculty members spent their leaves in residence. **Gary Gray**'s leave was supported by two National Institutes of Health grants. His main accomplishments were to write up a number of manuscripts and to start to develop a computerized data base of spectroscopic data relevant to the characterization of complex carbohydrates.

Steve Kass's sabbatical differed from the typical furlough in that he joined our faculty in 1986 and thus had not completed the usual six years of service requirement. Steve's leave was part of his University of Minnesota McKnight–Land Grant Professorship, which supports a year's leave for each holder. These leaves are intended to provide teaching and committee service relief to new Assistant Professors in order to allow them to pursue their research activities full-time, and are not counted in future eligibility for single quarter or sabbatical leaves. Steve spent his sabbatical concentrating on his research program and working with his growing group of graduate students, although he continued to serve as the organic seminar coordinator and on oral examining committees.

1990-91

George Barany devoted much of his time in residence, working closely with his graduate students and postdoctoral fellows on peptide chemistry research, supported by several grants from the National Institutes of Health, and playing closely with his young family. He travelled extensively in the United States and Europe, lecturing on his research and visiting laboratories. While disappointed at being unable to meet fully his goal of clearing the backlog of papers to be written, George reports with pride that he did *not* submit any grant proposals during the period of his leave.

John Ellis concentrated his efforts at home in both research and teaching related activities, with support from the Bush Foundation Sabbatical Program. Given his interest in the inorganic chemistry of transition metals in low oxidation states, John spent a major portion of his time exploring new reactions of materials containing scandium, yttrium and lutetium. In parallel, he also worked on developing a new method of teaching inorganic chemistry at the advanced undergraduate level.

Likewise, **Peggy Etter** devoted a significant portion of her time to working on research, with her support also provided by the highly competitive Bush Sabbatical Program supplement. She wrote numerous papers and grant proposals, and travelled widely to universities and companies to give talks and consult.

Ken Leopold took his sabbatical leave as part of his McKnight-Land Grant Professorship. Essentially all of his time was spent working on research and writing papers and proposals. He also travelled extensively around the country to present seminars at conferences and universities.

Last but not least, **Hal Swofford** spent the year at Aspen Research Corporation in New Brighton, Minnesota. There he participated in the ongoing "chemical sensors" research program, where he worked on developing a device for the determination of iron, water and particulates in petroleum based media.

We would be very interested in accounts of similar activities on the part of our alumni, and would anticipate inclusion of such news in our "Alumni Reports" section.

(Transition from page 7)

DEATH

Raye Kreevoy passed away, March 9, 1990. She had been under treatment for cancer since 1985. Her death was a shock, since the cancer seemed to be under control, but the chemotherapy which she was receiving proved to be more than her heart would tolerate, and she died, very suddenly, of cardiac arrest. Raye and **Maurice Kreevoy** had been married for 37 years.

Raye had a distinguished career in gerontological nursing and she received numerous awards in recognition of her work. She was the director of Aging Services of the Jewish Family & Children's Service and a member of the Governor's Council on Aging. She had warm friendships with a number of department members and their wives, and also with many students and former students. She always was interested in departmental affairs. Raye is missed and mourned by her husband and many friends.

Alumni Reports

Regular readers will recognize the alumni reports section as our customary centerpiece. It is very rewarding to hear from our audience, and we appreciate your wide variety of responses to our call for news. Triumph or tragedy, compliment or criticism, we encourage you to send us your contribution to these pages. To the many who tell us that they look forward to reading these accounts of colleagues and friends: thank you–we do, too!

Conforming to our established format, these details are presented with your (slightly edited) narratives: name, degree and year, advisor, and current professional affiliation. Gladys Olson or Kathy Ross will be glad to help you establish contact with these or other of our alumni by providing addresses and phone numbers when known.

Rodney L. Biltonen (Ph.D. '65, R. W. Lumry), Department of Biochemistry, University of Virginia School of Medicine, Charlottesville, Virginia.

I have been Professor of Biochemistry and Pharmacology at the University of Virginia since 1972. My major current research interests are the statistical thermodynamics of cooperative structural fluctuations of lipid bilayers and the activation of phospholipase A2 on membrane surfaces. In July 1989 I received the Huffman Memorial Award from the Calorimetry Conference in recognition of contributions to thermochemistry and thermodynamics.

Frank D. Blum (Ph.D., '81, W. Miller), Department of Chemistry, University of Missouri-Rolla, Rolla, Missouri.

A Faculty Excellence Award was presented to Frank Blum at ceremonies held on December 9, 1989, to "recognize and reward faculty whose teaching, research and service contributions are exemplary and who strike an effective balance among these various aspects of their work." (reported by University of Missouri-Rolla news and publications press release; see accompanying photo)

Douglas J. Bridgeford (B.Chem. '47), Tee-Pak, Inc., Danville, Illinois.

Since graduation I have been employed by the above-listed manufacturer of meat, cheese, and other food processing and packaging casings. These are made primarily from polymer films such as polyethylene, nylon, and polyester. Initially my work was in analytical method development, with some physical tests creation. In 1955, I was transferred to research, where I have been since.

In my 41 years at Tee-Pak, I have several hundred inventions. I currently hold fifty-five U. S. patents and several hundred corresponding foreign issues. In about half of these, large scale commercial application has been made, with or without royalty, both at Tee-Pak and in other companies. I was a pioneer in cellulose and other polymer grafting and hold basic patents that have been used by hundreds of researchers. The process for grafting on wood pulps and modifying films for permeation change are just now becoming commercial on a large scale. I am primarily a polymer chemist and inventor.

Because of a severe visual impairment from congenital cataracts, I have about five percent vision and have done all my work with the aid of technicians or subordinate chemists. In 1963, I was elected Fellow of the American Institute of Chemists.

Mark E. Brigham (B.Chem. '88, W. E. Noland), Department of Civil and Mineral Engineering, University of Minnesota, Minneapolis, Minnesota.

I am nearing completion of my Master of Science in Civil Engineering, specializing in environmental engineering. My thesis is on mercury in lakes and aquatic biota of northeastern Minnesota. I am still in contact with Todd Gac, Keith Palmer, and Dr. Mary Condoluci, all 1988 graduates under Dr. Noland–and in touch with Dr. Noland, too.

Frank D. Blum receives Faculty Excellence Award from University of Missouri-Rolla Chancellor Martin C. Jischke

Jeannette E. Brown (M.S. '58, C. F. Koelsch), Merck & Co., Inc., Research Department, Rahway, New Jersey.

I had the honor to serve the members of the North Jersey Section of the American Chemical Society, in 1990, as their first black woman chairperson. The section was one of those nominated for the Outstanding Section Award. I still serve the North Jersey Section as a councilor, and I will run for reelection to my third term as such this fall.

I am active on the North Jersey Section Project SEED Committee (see photo on back page). I helped to write a proposal for a post SEED program for our local section students which, if renewed every year, will take them over the critical years from high school to second year in college. This proposal was funded for one year by the Camille and Henry Dreyfus Foundation.

I was appointed to serve as a consultant to the National Science Foundation as a member of the Committee on Equal Opportunities in Science and Engineering. The committee provides advice to the foundation concerning its policies and activities to encourage full participation of women, minorities, and persons with disabilities, currently underrepresented in scientific, engineering, professional, and technical fields. This is a very important committee, especially with the current concern about science education and the pipeline, and I am proud to serve.

I was elected into the Hunter College Alumni Hall of Fame in May 1991, for my work on Project SEED and other programs designed to encourage minority students to study science. I received an award as Outstanding Woman Scientist of the Year from the Metropolitan Chapter of the Association for Women in Science.

I am also active in the laboratory, and delivered the first paper on which I am a senior author at the Middle Atlantic Regional Meeting in May 1990, entitled "Synthesis of Desthio Analogs of Cilastatin as Potential Inhibitors of the Mammalian beta Lactamase, Renal Dipetidase (Dehydropeptidase-1, DHP-1)."

I recently attended the 32nd National Organic Symposium at the University. I renewed my friendships with Dr. Noland and Dr. Koelsch (by phone), and looked at the newly remodeled Smith Hall. I also checked, and my MS thesis is still on file. That's all the news from New Jersey.

Robert E. Buntrock (B.Chem. '62, W. E. Noland), Amoco Corporation, Naperville, Illinois.

In October, I received my third patent–after 20 years! Although my primary function is still literature and patent searching, I am also involved in implementation of software for chemical structure handling. I have had a fair amount of interaction with college and high school chemistry teachers and recently joined the Division of Chemical Education of the American Chemical Society. I get to talk to Wayland Noland at ACS meetings, and enjoyed talking to fellow Princetonian Lou Pignolet at Amoco's Professors Day. I hope to see more of the faculty here at Naperville or at Amoco's receptions at ACS meetings.

An-Cheng Chang (Ph.D. '87, L. L. Miller), Micro Vesicular Systems, Inc., Nashua, New Hampshire.

Mary J. Condoluci (Ph.D. '88, W. E. Noland), E. I. du Pont de Nemours & Company, Waynesboro, Virginia.

Mark W. Dahl (B.Chem. '85, P. G. Gassman), United States Marine Corps, Beaufort, South Carolina.

I have been a Marine Officer since graduation, and though my plans for the distant future are as yet undecided, I would not change careers with anyone for the next couple of years, at least.

Christopher G. Dewey (M.S. '83, J. E. Ellis), deceased.

Chris Dewey died in an accident while climbing Snohomish County's Glacier Peak in the state of Washington on July 5, 1991, at age 35. An experienced and careful climber, he had apparently become separated from the rest of his group during a sudden white-out on Sitcum Glacier, about 1,500 feet below the 10,400 foot summit on their way down from the climb. Dewey is remembered by his friends in chemistry as a Renaissance man, with diverse interests and talents. He was working as a hazardous materials inspector with the Department of Labor and Industry, and he developed one of Washington State's first hazardous materials tracking systems for the Bellevue Fire Department. Memorials are requested to the Nature Conservancy, 217 Pine Street, Suite 1100, Seattle, Washington 98101. (reported to us by his friend, Mac Davis)

John E. Franz (Ph.D. '55, S. W. Fenton), Monsanto Agricultural Company, Springfield, Missouri.

The 1990 Perkin Medal was awarded to Dr. Franz in ceremonies held in New York on March 14, 1990. Regents' Professor Paul Gassman participated in his capacity as president of the American Chemical Society. The Perkin Medal is given annually for outstanding work in applied chemistry, and Dr. Franz's role in the development of the herbicide Roundup clearly meets this criteria.

Timothy P. Gibbs (B.A. '78, R. C. Brasted), Minneapolis Psychiatric Institute, Minneapolis, Minnesota.

After graduation, I worked for a year as a bench chemist in a Minneapolis paint factory, a job made easier by my excellent training. I went on to the University of Minnesota Medical School, and residency at the Mayo Clinic. I recall a high school English teacher once told me I was too focussed on math and science. That must have gotten to me, because I am now a child and adolescent psychiatrist in practice in Minneapolis.

I still remember my math and science days in chemistry at the University. I remember Lou Pignolet from first year chemistry, Paul Gassman's first class, and assisting under the late Larry Conroy. I remember the day it rained in Ed Leete's organic class, and he didn't even complain. After class, I asked him why–he said, "because I was the one who left the hose on in the greenhouse last night!" Fond memories, all.

Sabiha Gokcen (B.Chem. '85, G. R. Gray), Department of Chemistry, University of California, Berkeley, California.

I am currently working on my Ph.D. at Berkeley. I work for Giovanna Ferro-Luzzi Ames in the Department of Molecular and Cellular Biology. Our group studies basic amino acid transport in *salmonella typhimurium*. I hope to finish my degree sometime this year, and after that I hope to find a postdoctoral position and eventually go into teaching.

Alan R. Hargens (B.A. '66, H. Bent), NASA-Ames Research Center, Moffett Field, California.

Since starting with NASA-Ames Research Center three years ago as Chief of the Space Physiology Branch, I've become involved (50% time) with space project activities. As space station project scientist, I ensure that scientific priorities provide the main impetus behind the design of life science facilities on Space Station Freedom. The goal is to build a 2.5 meter centrifuge and associated facilities for studying animals and plants; these studies would start about the year 2000. The other half of my professional time concerns research on cardiovascular and musculoskeletal adaptations to the space environment, and development of exercise equipment so that astronauts can be exposed to simulated normal gravity while they're in space. To keep up our research momentum, we've been fortunate to have many outstanding staff, students and visiting faculty in the lab over the past couple of years. I've also found time to teach at U.C.S.D. (Orthopedics) and Stanford ("Life in Space"). In our spare time, my family and I enjoy snow skiing at Tahoe and water skiing at nearby lakes.

Phillip Isaacs (B.A. '79), IBM-Endicott, Endicott, New York.

E. Harry Jancis (Ph.D. '68, R. M. Dodson), Uniroyal Chemical Company, Inc., Middlebury, Connecticut.

Wadim Batorewicz (Ph.D. '68, W. E. Noland) and I still hold down the fort at Uniroyal. We have survived a typical '80's scenario: threatened takeover, preemptive raid by corporate officers, breakup of company, sale of chemical division to some "junk bond artists," then a management buyout.

After getting our degrees, Wadim and I started innocently enough making chemicals on a 100 milliliter-to-1 liter scale. Since then our paths have split–Wadim considers a nanogram a comfortable working quantity, whereas I run most of my reactions in a 2000 gallon reactor.

I thoroughly enjoy reading the *Minnesota Chemists Newsletter*. Please give my best to all the professors who still remember me.

Duane A. Jones (Ph.D. '61, W. E. Noland), Appleton Papers, Appleton, Wisconsin.

In 1985, I accepted an early retirement offer from Henkel Corporation, then based in Edina. Henkel had purchased General Mills Chemicals in 1978, and in 1985 they were reorganizing and relocating the Minneapolis operations.

In 1986, I started a consulting business, providing assistance and direction on chemical safety and regulatory questions. Business was good, but in 1987 an offer from Appleton Papers was too good to pass up. I joined them in March of that year and in October moved to Appleton with my wife Maralyn. I am presently manager of product and workplace safety for Appleton's U.S. operations.

Permanent retirement is now on the horizon, probably in Minnesota in five or six years. But, who knows? Many changes have taken place in the past four years!

Lester Krogh (Ph.D. '52, C. F. Koelsch), 3M Company, St. Paul, Minnesota.

Dr. Krogh was awarded the honorary degree Doctor of Science by the University of Minnesota at graduate school commencement ceremonies held on May 18, 1990. The citation noted Dr. Krogh's diverse contributions to the 3M Company and to the University of Minnesota, and particularly referred to his "visionary leadership [which] has served as an example for industrial concerns nationwide."

Herbert A. Laitinen (Ph.D. '40, I. M. Kolthoff)

Professor Laitinen died at his home in Gainesville, Florida, on March 22, 1991, at the age of 76. After completing his Minnesota degree, he joined the chemistry faculty at the University of Illinois in 1940, where he became the head of the analytical division in 1953. In 1974, he accepted the position of graduate research professor at the University of Florida, which position he occupied at the time of his death.

Laitinen's interests covered a wide spectrum of analytical chemistry, winning him numerous honors and awards. These included the American Chemical Society's (ACS) Award in Analytical Chemistry (1961), the Synthetic Organic Chemical Manufacturers Association Gold Medal in Environmental Chemistry (1975), and the Talanta Medal (1989). He was an honorary member of the Finnish Academy of Sciences, the Japan Society for Analytical Chemistry, and the Royal Society of Chemistry, among others. He was author or co-author of over 200 publications, perhaps the best known being the text, "Chemical Analysis", first published in 1960. In addition, he served as the editor of the ACS journal *Analytical Chemistry* from 1966 to 1976. During his long career he influenced many future generations of scientists with his excellent teaching, as well as making major contributions to analytical chemistry as a discipline.

Professor Laitinen retained his ties with Chemistry at Minnesota, and was always a good friend to the Department. In connection with Professor Kolthoff's 90th birthday in 1984, he helped to organize a major drive to increased the Kolthoff Fund endowment, and a prestigious reception to honor his mentor. His former students, colleagues and friends will remember him as not only a great scientist, scholar and teacher, but also as a friend who gave excellent advice and support.

Llewellyn G. Ludwig (B.S. '24, L. Cohen), retired.

Gale W. Matson (Ph.D. '56, W. M. Lauer), 3M Company, St. Paul, Minnesota.

I am a senior product development specialist in the industrial specialties division.

Donald S. McClure (B.Chem. '48), retired.

A symposium was held on May 9 and 10, 1991, at Princeton University to honor Donald S. McClure on the occasion of his retirement. In our spring 1986 edition, we quoted Professor McClure as follows: "It is so much fun to play with expensive new toys," referring to his work in laser spectroscopy, "that I have no intention of retiring and will have to be dragged out kicking and screaming." We hope that no such approach was required, and that Professor McClure will continue to have as much access to "toys" as he would want! (reported by Wayland Noland)

(Alumni Reports to page 14)

What do these characters know about chemical safety?

Better Safe Than Sorry

Our recently reactivated ACS Student Affiliate group has put together a 16 minute video tape on Chemical Lab Safety. It was filmed by the Twin Cities Public Television station and is a refreshing change from the standard technical approach. This is a story of a freshman chemistry student (Michael, played by **Christopher Langer**) and his encounters with some lab *nemeses* (**Jonas Nissen** as Rex-plosion, **Catherine Brander** as BURNadette, and **Aron Blankenburg** as Mess Man) His fears of doom in the chemistry lab are quieted by a teaching assistant (Monica, played by **Dawn Reed**), who discusses laboratory safety with the student while shots of doing things the correct way are shown. All of the actors and actresses were hired through the University of Minnesota Theater Department. The executive producer was **Stephanie Miller**, the director was **Denis J. LaComb**, and it was written by **Susan Steger Welsh**. The endeavor was endowed by 3M Company, ICI Americas, Monsanto, the Department of Chemistry of the University of Minnesota, and the National ACS Student Affiliates Program through an innovative activities grant. All proceeds from the sale go to the ACS Student Affiliate chapter. To order a copy of "BETTER SAFE THAN SORRY: Surviving and Thriving in Chemistry Lab" send $49.95 plus $3.45 shipping and handling ($53.40 each tape) to **Box M13, Department of Chemistry, University of Minnesota, 207 Pleasant Street SE, Minneapolis, MN 55455**. Make checks payable to The University of Minnesota.

(Alumni Reports from page 13)

Eugene L. McDonald (B.Chem. '57), retired.

Since retiring from Shell Chemical, a division of Shell Oil Company, I have started a new and very enjoyable (and lucrative) career as a high school and college baseball and football official in Westchester and Putnam Counties, New York. I get in about 100 baseball games per year, with all the summer leagues, and 35 football games. It's a far cry from chemistry.

William C. O'Mara (Ph.D. '69, J. E. Wertz), Rose Associates, Los Altos, California.

For the past ten years I have been working as a consultant in electronic materials, especially silicon, used for integrated circuit manufacturing. I provide technical and market information to suppliers and users of these materials. Recently, someone asked me how I liked consulting. "Do you like it better than working for a living?" "Yes," I answered, "I do!"

Constantine S. Papageorgiou (B.Chem. '85, W. L. Reynolds), Joint Doctoral Program, University of California at San Diego and San Diego State University, San Diego, California.

After receiving a Master of Arts degree from the University of California at Santa Barbara in 1987, I am currently working toward completing my Ph.D. degree in analytical chemistry. My research topic is laser spectroscopy as applied to the development of novel analytical techniques. I would like to thank the department and the University for all the wonderful memories. Keep up the good work!

James R. Persoon (Ph.D. '82, E. J. Meehan), Honeywell Defense Systems Group, New Brighton, Minnesota.

Since my last report, I have assumed (in August, 1988) my present position as director of environmental management, with responsibilities at sixteen of Honeywell's forty locations in the Twin Cities area.

Anton F. Rausell (B.Chem. '35), retired.

Since retiring, my wife Joan and I have been doing some travelling: U.S.A., Europe, Africa, China and Japan. In my spare time I have been doing some freelance writing. I have lost track of most of my classmates, but have kept in touch with two, **Herb Laitinen** (Ph.D. '40, I. M. Kolthoff) in Gainesville, Florida and **George Lones** (M.S. '36) in Colorado Springs, Colorado. I have many fond memories of the University of Minnesota. Go, Go, Gophers!

Edgar E. Renfrew (Ph.D. '45, W. M. Lauer), retired.

I retired in 1980 from American Color and Chemical Corporation, where I was vice president for research and development. During my professional life, I worked for three companies which have had seven names. My work led to 68 U.S. patents, some of which are worth the paper they are printed on.

Frank H. Stodola (Ph.D. '33, W. M. Lauer), retired.

Dr. Stodola has donated his collection of correspondence from a dozen Nobel laureates to the Othmer Library. This collection contains over eighty letters and postcards written between 1937 and 1983, and chemistry laureates represented here include Adolf Butenandt, Richard Kuhn, Harold C. Urey, Vincent du Vigneaud and Melvin Calvin. (from the Othmer Library News, 2.2, summer 1990)

Andrew Strandjord (Ph.D. '85, P. F. Barbara), Dow Chemical Company, Midland, Michigan.

Marcus W. Thomsen (Ph.D. '82, W. E. Farneth), Chemistry Department, Franklin & Marshall College, Lancaster, Pennsylvania.

I was promoted to Associate Professor effective July 1, 1990. I continue to do research with undergraduate chemistry majors on a variety of organic chemistry projects.

Donald R. Theissen (Ph.D. '61, W. Parham), 3M Company, St. Paul, Minnesota.

My current position is director of corporate product responsibility. I have recently held positions as department general manager for aerospace materials (1988-89) and structural products (1984-88).

Thu-van Thi Tran (B.Chem. '89, M. C. Etter), 3M Company, St. Paul, Minnesota.

Clinton Van't Land (B.Chem '86, E. Leete), Department of Chemistry, University of Washington, Seattle, Washington.

I relocated with Dr. Heinz Floss from Ohio State University in September of 1987, and I am currently working on my second project in the doctoral program. Both are related to the use of shikimic acid as a naturally occuring precursor to the growth of a natural product, i.e., in a micro-organism or bacterium.

(NSF from page 8)

During her first year in the department, Damme carried out formal and informal studies of the culture of the department. She helped organize several career related workshops (see article, page 10), and brown bag seminars on topics such as stress management and interview skills–all in response to needs and interests expressed by graduate students. She taught classes on leadership, power, and communication, in response to career development needs of the departmental staff. She also met regularly, on an individual basis and in groups, with faculty members and discussed the ways in which daily departmental activities reflect and affect the culture, and ways in which the organization can be more responsive to diversity issues. These interactions and programs provided the data and background for the NSF proposal, which was completed and submitted near the end of the first year of this program.

It was during Damme's second year in the department that the NSF grant was funded, thus allowing us to build upon the programs she initiated. Chemistry graduate assistants **Jason Blanchard**, **Michelle Janisch Fidler**, **Eric Gunderson**, **Richard Hoffman**, **Sue McNicholas**, **Michelle Mullikin**, **Liz Ottinger**, and **Dacia Pickering** were hired on a part-time basis and worked with the advising office staff and chemistry faculty. These students, under the direction of graduate studies coordinator **Sue Page,** worked on projects in peer advising and student recruitment; with Susan Damme and the Equal Opportunity Committee on developing portable teaching modules on chemistry as a career and on planning career workshops; and with Professor **Lou Pignolet** and undergraduate studies coordinator **Stephanie Miller** on outreach programs in junior and senior high schools (see article, page 1).

The position of Women's Advisor and Ombudsperson has no precedent in the University or in any other science department of which we are aware. We are proud to be at the forefront of academic efforts to address the often sensitive and difficult questions of diversity. We see this office and this program as a beginning with a lot of hard work and exciting challenges ahead. The renewal of the NSF funding is still pending as we go to press.

If you have further questions about this program or if you would like to offer suggestions or services to help with these efforts, please call Susan Damme at (612) 625-0339. We would be delighted to hear from you and to learn of your interest in these activities.

Stephen Prager

Chemistry Hosts National Organic Symposium

During the week of June 16, 1991, nearly one thousand card-carrying organic chemists assembled on the Minneapolis campus for the 32nd National Organic Chemistry Symposium. This event, celebrated every other year and one of the major conferences in organic chemistry, is sponsored by the Division of Organic Chemistry of the American Chemical Society. The symposium's Executive Officer, Professor **Frank Mallory** of Bryn Mawr College, assembled an outstanding roster of eleven invited speakers, which was headed by the 1991 Roger Adams awardee, Professor **Gilbert Stork** (Columbia). Participants enjoyed an excellent accounting of the vitality and diversity of the discipline of organic chemistry through the lectures of **Dennis Curran** (Pittsburgh), **Peter Dervan** (Cal Tech), **Dennis Dougherty** (Cal Tech), **Phil Eaton** (Chicago), **Bob Grubbs** (Cal Tech), **Ken Houk** (UCLA), **Jerry Meinwald** (Cornell), **Dieter Seebach** (ETH), **Barry Sharpless** (Scripps Research Clinic), and **Paul Wender** (Stanford).

Over 160 posters were presented in two (sometimes late) evening sessions. On Wednesday evening the symposium participants enjoyed an outdoor feast on the main campus mall before being treated to a specially arranged concert by the Dallas Brass in Northrup Auditorium. Everyone benefitted from as perfect a run of mid-June weather as we can remember. The local organizers for the symposium, **Paul Gassman**, **Tom Hoye** and **Scott Rychnovsky** (posters), were aided greatly by the efforts of the University's Department of Professional Development and Conference Services. It is clear that the great majority of guests left the Twin Cities with both a heightened appreciation of all this area has to offer as well as notepads filled with exciting and stimulating new advances in organic chemistry.

Pragerfest Symposium

On Friday and Saturday, October 12 and 13, 1990, a special symposium on polymer theory and related topics was held at the department, in honor of Professor **Stephen Prager**, who retired last year. Organized by **John Dahler** and **Alden Mead**, the event consisted of three sessions of invited lectures, a poster session, and a banquet on Friday evening. Invited speakers from outside the University were Professor **Harry Frisch** of the State University of New York at Albany, and Professor **Karl Freed** of the University of Chicago. Speakers from the University of Minnesota were Professors **H. Ted Davis**, **Timothy Lodge**, **Wilmer Miller**, **Victor Bloomfield**, **Matthew Tirrell**, and **John Dahler**.

The poster session consisted of twenty-three posters on a wide range of theoretical topics contributed by various research groups at the University of Minnesota. Among those on hand for the event were a number of Steve's former students and other associates. At the banquet, which was attended by over fifty people, there were several testimonials to Steve and his wife Julie for their contributions to science and to the lives of those who know them.

Besides being of considerable scientific significance, the Pragerfest was a well-deserved salute to Steve and Julie. A special issue of *Theoretica Chimica Acta* dedicated to Steve will contain several articles based on presentations at the Pragerfest, as well as other articles on topics of theoretical significance.

Chemistry Students Recognized

Honors and awards to our students provide the encouragement and stimulus to achievement that will benefit all of society as these young people make their marks in the world. We are happy to present here our 1989 and 1990 winners, as well as those announced in spring of 1991. For the latter, a special awards ceremony was instituted in conjunction with IT commencement activities, giving the awardees a chance to socialize with each other as well as to meet some of the donors of the awards. Faculty advisors and other interested faculty also attended the ceremony and the social. Proud parents of these students and of all our senior chemistry majors were invited as well, giving them a chance to see our facilities and participate in the recognition of achievement. We were very pleased with the turnout for this event and expect to continue this celebration in years to come.

The following prizes were awarded to undergraduate chemistry majors: G. B. Heisig Undergraduate Research Fellowship–$1,500 fellowships awarded to advanced undergraduate students who have demonstrated outstanding achievement in undergraduate research in addition to overall scholastic excellence: 1989, **Nicholas Armstrong** and **Richard Kilby**; 1990, **Doug Johnson;** 1991, **Annette Trowbridge** and **Edward Ulrich**. Lloyd W. Goerke Scholarship–$1,000 awards to chemistry majors who have shown outstanding academic achievement and who have financial need: 1989, **Kraig Anderson** and **Trang Vo-Nguyen**; 1990, **Julie Robertson**; 1991, **Steven Gerst** and **Doug Johnson**. Robert C. Brasted Memorial Fellowship–$800 fellowship, as well as a part time apprenticeship in the department's general chemistry program, awarded to outstanding chemistry majors who have expressed an interest in a teaching career in chemistry: 1989, **Daniel Christen**; 1990, **Matt Comstock**; 1991, **Brad Backes**. M. Cannon Sneed Scholarship–$600 award for chemistry majors who demonstrate great promise for future achievement: 1989, **Craig Hoyme**; 1990, **Daniel Christen**; 1991, **Mark Aubert**. Chemistry Alumni and Faculty Scholarship–$500 award for a freshman chemistry major who has demonstrated outstanding academic achievement, funds donated by alumni of the department and by faculty: 1989, **Darin Du Mez**; 1990, **Bradley Ferguson**; 1991, **Kimberly Marquardt**. J. Lewis Maynard Memorial Prize in Advanced Inorganic Chemistry–$100 cash award for the purchase of books, given for outstanding scholastic achievement in advanced inorganic chemistry: 1989, **Peter Radford**; 1990, **Brian Pagenkopf**; 1991, **Sutjano Jusef**. Walter M. Lauer Prize–$100 cash award for the purchase of books, for advanced undergraduate chemistry majors with distinguished academic records who have demonstrated strong interest in organic chemistry: 1989, **Brian Pagenkopf**; 1990, **Theodore Jerdee**; 1991, **Rebecca Smith**. CRC Freshman Chemistry Achievement Award sponsored by the CRC Press, Inc.–the latest CRC Handbook of Chemistry and Physics, given to freshman chemistry majors for outstanding achievement in freshman chemistry: 1989, **Darin Du Mez**, 1990, **Michael Armstrong**; 1991, **Jason Johenns**. Merck Index Award sponsored by Merck & Co., Inc.–latest edition of the Merck Index, given to sophomore chemistry majors for outstanding scholastic achievement in organic chemistry: 1989, **Charles Miller**; 1990, **Annette Trowbridge**; 1991, **Bijan Mossadeghi**. Undergraduate Award in Analytical Chemistry, sponsored by the Division of Analytical Chemistry of the American Chemical Society–a year's subscription to the journal *Analytical Chemistry*, given for outstanding scholastic achievement in analytical chemistry: 1989, **Trang Vo-Nguyen**; 1990, **Dean Fairbrother**; 1991, **Matt Comstock**. Two new awards were added this year and will be awarded annually henceforth: the Eli Lilly Undergraduate Award, a $200 award for a sophomore or junior chemistry major who has an interest in a career in industry and who has shown outstanding academic achievement, made in the form of a check to the University Bookstores for the purchase of books and supplies: **Brent Nielson** was the 1991 recipient. The Thomas Du Bruil Undergraduate Research Award, a $100 prize for an undergraduate student who has demonstrated outstanding achievement in undergraduate research in chemistry at the sophomore or junior level: **Daniel LeCloux**, was the 1991 recipient.

1991 Robert C. Brasted Memorial Fellowship winner Brad Backes is congratulated by Mrs. Corinne Brasted at the 1991 undergraduate awards ceremony

Mohammad Zia-Ebrahimi held multiple honors: he was the 1989-90 President of the Student Affiliates of the American Chemical Society (SA/ACS); he was named Outstanding IT Student by the IT Alumni Society for his involvement with the SA/ACS and with the outreach project; and he took second place in the Newton Winchell Student Research Competition sponsored by the Minnesota Academy of Sciences. **Jason Stenzel** and **Keith Pfister** made poster presentations of their research at the 1990 National American Chemical Society Meeting in Boston, Massachusetts. Junior **Peter Radford** was elected to Associate Membership in Sigma Xi, the scientific research society, and was awarded the George T. Walker Prize in the Chemical Sciences. During the fall of 1990, undergraduate research assistants **Shelly Wall** and **Christine Abbott** were selected All-Academic Big Ten Cross Country participants. Junior **Kurt J. Kiewel** won the George T. Walker Cash Prize for Undergradaute Students in the Chemical Sciences, and was elected to associate membership in Sigma Xi at its annual banquet held on May 15, 1991. **Troy Holland** won the General Mills Total Quality Scholarship Award, a $1,500 merit-based scholarship to a junior chemistry major, to be applied toward tuition, fees and books. Chemistry major **Steven Gerst** won the Barry Goldwater Scholarship award in a steep national competition, a full tuition scholarship for two years (up to $7,000 per year). Our congratulations to each of these outstanding undergraduate chemistry students.

Outstanding Teaching Assistant of the Year for 1989 was **Christopher Dinsmore**, a graduate student working toward the Ph.D. under the direction of Professor Tom Hoye. The open nomination process for this award allows participation by faculty, staff and students, resulting in a true indication of peer recognition. Chris's student supporters were unstinting in their praise of his teaching abilities, safety-consciousness, fairness, and adaptability.

For 1990, this award has evolved to include an increased cash prize, thanks to the support of the Pillsbury Company. In honor of **Robert L. Ferm** (B. Chem., '48 and M.S., '50), long-time employee in analytical and food chemistry, Pillsbury has endowed a fund intended to recognize outstanding graduate student teaching in chemistry. Thus the award has been renamed the Robert L. Ferm Memorial Award, and we take this opportunity to extend our appreciation to Pillsbury Technology Center's Department of Chemistry. The 1990 recipient was **Khushrav Crawford**, also a Ph.D. candidate working in the laboratory of Tom Hoye. Khushrav's nominators were enthusiastic about his open-door policy, his preparedness, and his commitment to his subject matter. Several said he was the best TA they had ever encountered in any of their classes.

In 1991, there were many impressive nominations. Thanks to the generosity of Pillsbury, two awards were thus made for outstanding teaching assistantship: **Susan Kersten** and **Steve Reimer** were both Robert L. Ferm Memorial awardees. Susan's nominators praised not only her preparation and safety-consciousness, but also her helpful attitude and approachability. One, who was repeating the lab after an earlier negative experience, said that if Susan had been his TA during the prior year he would not have changed his major. Steve's recommenders were similarly impressed, and pointed out his concern and personal attention, as well as his willingness to stay late until everyone had completed their laboratory assignment. Our compliments to all of these deserving chemistry graduate teaching assistants!

Graduate students holding 1989-90 academic year corporate fellowships were **Xin-Gui Zhao**–Air Products; **Robert Hammer**–Amoco; **Sei-Chang Ahn**–Dow; **Stan Rak**–Du Pont; **Chris Dinsmore**–Rohm & Haas; and **Susan Reutzel**–3M. Advanced graduate students **Dan Freedman**, **Abhik Ghosh** and **Scott Hanson** were Graduate School Dissertation Fellows. First-year Departmental Fellows were **David Binder**, **Paul Humpal** and **Susan McNicholas**. The Elmore Northey Fellow was **Franco Lombardo.** A First-year NSF Fellowship was held by **Letitia Yao**. **Dan Adsmond** received the Pauling Award for best student poster at the 1989 American Crystallographic Association Meeting in Seattle, and **Susan Reutzel** won the Pauling Award for the best student poster presentation at the 1990 American Crystallographic Assocation Meeting in New Orleans.

During 1990-91, academic year corporate fellowships were held by graduate students **Christine Blaine**–Air Products; **Roseann Kroeker**–Amoco; **Charles Liberko**–Dow; **Anne M. Weber**–Hercules (a special first year student award); **Nestor Rotstein**–Rohm & Haas; and **Paul Hanson**–3M. A special graduate school block grant allowed us to award further departmental academic year fellowships to **Abhik Ghosh**, **Kimberly Johnson**, **Vincent Kwan**, and **Yi-Ping Liu**. Graduate School Dissertation Fellowships were awarded to **Theodore Holman** and **Susan Reutzel**. The Elmore Northey Fellow was **Steven Jons**. **Michael Hill** was awarded the Stanwood Johnston Memorial Fellowship, an award administered by our graduate school and consisting of an academic year stipend as well as a tuition scholarship, health insurance and a summer stipend.

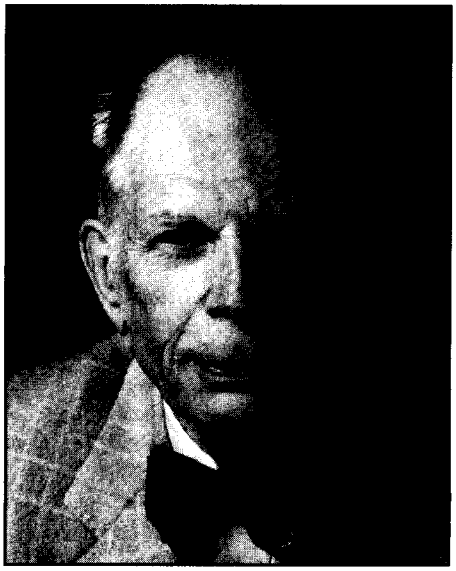
If you wish to make a donation to chemistry, please send your donation to the attention of the Chair, Department of Chemistry, 139 Smith Hall, 207 Pleasant Street Southeast, University of Minnesota, Minneapolis, Minnesota 55455. You may also use the donor forms and envelopes provided by the University of Minnesota Foundation Office. You may specify that your gift be used wherever needed, or you may designate it for a particular purpose.

Lumry Symposium

An "International Symposium on the Thermodynamic Basis of Protein Structure and Function," in honor of Professor **Rufus Lumry**'s 70th birthday, was held in Kansas City, Missouri on October 4–6, 1990. Over 100 of Rufus's colleagues, former students, and friends attended this meeting, featuring scientific addresses by twelve internationally known scientists. The social highlights of the meeting included a cocktail reception sponsored by the Kansas City Chamber of Commerce and a banquet at which several people shared their reminiscences of acquaintance with Rufus. A stained-glass version of the Biophysical Chemistry Laboratory logo was presented to Rufus, and the Mayor of Kansas City declared October 4, 1990 "Rufus Lumry Day."

The scientific portion of the meeting was opened with a presentation by Rufus on "The History of Protein Evaluation–A Speculative Entertainment." This was followed by lectures from **Ken Dill**, professor of pharmaceutical chemistry at the University of California, San Francisco, **John Brandts**, professor of chemistry at the University of Massachusetts, and Dr. **Peter Privalov** of the Institute for Protein Research Poustchino, USSR, on thermodynamic aspects of protein structures. A session focussing on protein folding pathways and protein dynamics included presentations by **Robert Baldwin**, professor of biochemistry at Stanford School of Medicine, **Ernesto Freire,** professor of biochemistry at Johns Hopkins, **John Schellman**, professor chemistry at the University of Oregon, and Dr. **Alexander Demchenko** of the Ukrainian Academy of Sciences, USSR. The symposium was concluded on Saturday morning with lectures on the effects of solvents on protein structure and function by **Serge Timascheff**, professor of biochemistry at Brandeis, **Alexander Klibanov**, professsor of chemistry at MIT, and **Chien Ho**, professor of biochemistry at Carnegie-Mellon University. The session was concluded with a talk from **Gary Ackers**, professor of biochemistry at Washington University, on the assembly of the hemoglobin tetramer.

The celebration was scientifically stimulating, socially enjoyable, and a fitting expression of gratitude and appreciation for Rufus's lifelong work on protein structure and function. Special thanks for a job well done are extended to the organizers: **Wayne Bolen** of the University of Southern Illinois (Chairman), **Rodney Biltonen** of the University of Virginia (Program Chair), **Harvey Fisher** of the Veteran's Administration in Kansas City (local arrangements) and **Andreas Rosenberg** of the University of Minnesota (treasurer).



Rufus Lumry

We Thank You

Budget deficits, spending cutbacks, and dwindling foundation and governmental agency support mean an ever increasing dependence upon private sector backing. The University of Minnesota ranks high among public institutions in the level of support from its alumni and friends, and the Department of Chemistry ranks well within the University. The direct impact in the form of scholarships and fellowships for our students may be the most evident beneficial aspect of this largesse, but just as important to us is the concrete evidence of your confidence in us. If you are interested in further information about the various funds, please contact Gladys Olson (612/624-1603) or Kathy Ross (612/624-6000). We gratefully acknowledge private donors to the department during the period January, 1989 to June, 1990. A listing of donors from July, 1990 to June, 1991, to whom we are also most grateful, appears separately (see page 19, "We Continue to Thank You").

Industrial grants are the backbone of our summer support program for graduate students. Most of these students have had teaching responsibilities during the academic year, and departmental support during the summer frees them to concentrate on research and scholarly activities. Unrestricted industrial donations are also used in a discretionary fashion for special projects, including such items as the requisite matching funds for equipment proposals and laboratory set-ups for new faculty. On occasion, industrial contributions are designated to support the research programs of specific faculty, or for special areas of interest, such as advanced materials research. During 1989, our American Chemical Society Student Affiliate Chapter received donations designated to support their production of a chemical laboratory safety video (see article, page 14). Our thanks to the following companies and their educational foundations:

Air Products and Chemicals, Inc., Amoco Chemicals Corporation, Baxter Healthcare Corporation, BP America, Council for Chemical Research, Dow Chemical Company, DuPont, General Mills, Inc., Hercules, Inc., ICI Americas, Inc., Lec Tec Corporation, Merck Sharp & Dohme, Millipore Corporation, Monsanto, Pillsbury Company, Procter & Gamble Company, Rohm & Haas Co., Smith Kline & Beecham, 3M Company, and Union Carbide Corporation.

The **Kolthoff Fund** supports a distinguished lectureship series which has operated since fall quarter of 1979. During their week-long term, Kolthoff Lecturers meet with faculty and students and deliver a series of public lectures. Donors were Charles E. Bartsch, James M. Bierman, Kathryn L. Craighead, Marvin F. Formo, Willa I. Guss, Herbert A. Laitinen, Robert M. Leekley, Frederick L. Marsh, Francis W. Martin, James R. Persoon, and Joel H. Rapaich.

The **Chemistry Special Projects Fund** is the general discretionary fund for the department and supports a number of the student honors and awards programs. Many of the special activities highlighted in this newsletter would be impossible without this invaluable source of funding. Contributors were Irving M. Abrams, C. J. Alexander, Roger W. Amidon, Charles A. Anker, Robert A. Arnold, Jay S. Baldinger, Donovan F. Beaver, James M. Bierman, Leonard F. Bjeldanes, William D. Blackley, Margaret L. Blake, Leo F. Bohanon, David A. Bohling, John A. Bohn, Newman M. Bortnick, Gerhard M. Brauer, Nicolas Brodoway, Gary W. Brudwig, Richard O. Burmeister Jr., Robert B. Carlin, Joel C. Case, Grace D. Chapman, Brian H. Chollar, Yeh M. Chow, Paul J. Christensen, Joseph R. Conrad, Arthur J. Coury, Ruth Crawford, Frank A. Cutter Jr., Leonard J. Czuba, Peter Delvigs, Vinay V. Dighe, Diane R. Dittenhafer, Daniel H. Doughty, Charlotte R. Drenckhahn, Howard F. Drew, Deann J. Drottz, David W. Edelstein, David C. Egberg, Reuben B. Ellestad, Bentley W. Elliott, Clair J. Emery, Carl A. Evans Jr., Robert W. Fennell, Kristi A. Fjare, Kay L. Franzen, Nile L. Frawley, Mary Lou Gantzer, James H. Gibson, Terry J. Gilbertson, Bob G. Gower, Robert A. Grande, Robert G. Gremban, Gregory S. Gross, Mary M. Grula, Charles M. Hall, David A. Halsrud, John C. Halverson, Charles F. Hammer, Maxine B. Hancock, Gordon L. Hanson, Joseph B. Hanson, Willard A. Hareland, Charles M. Hartzel, James R. Haselman, Thomas G. Hayes, Florence S. Horner, Nicholas J. Horvath, John W. Hull Jr., Gary G. Irish, Henry V. Isaacson, John A. Jackson, Michael Jarcho, Bryan M. Jewson, Eugene C. Johnsen, John A. Johnson, Roger D. Johnson, Susan A. Johnson, Thomas H. Johnson, Bruce G. Julin, Michael A. Knoll, Gaylord J. Knutson, Kenneth E. Kosel, Richard J. Kvitek, Roger W. Kwong.

Lawrence L. Landucci, Jane D. Lanphear, William A. Larson, Richard J. Legare, Stephen R. Levitan, Paul H. Lieder, Steven A. Lindberg, Louis J. Ling, Thomas W. Lorsbach, Mark W. Martinson, Jay S. Mattsfield, Bruce M. Mattson, Karen S. Melchoir, John A. Melin, Pat F. Mentone, I. Keith Miller, Phillip L. Miller, Robert F. Modler, Wilbur N. Moulton, Kotaro Murai, Donald S. McClure, Eugene L. McDonald, Blaine C. McKusick, Robert J. McNair, John G. Newman, Edwin M. Nygaard, Jeffrey M. Olofson, Morris R. Olson, Dumas A. Otterson, Janice Owens, Constantine S. Papageorgiou, Rudolph Pariser, Myron A. Parsons, Dennis R. Pickering, George E. Plum, James H. Prestegard, Philip C. Price, Michael J. Prokosch, Douglas R. Radtke, Joel H. Rapaich, Lucinda Reichley-Yinger, Patricia A. Rethwill, Donald L. Robinson, George F. Rodgers, Jodi J. Roos, Christopher S. Roosevelt, Charles J. Rostek Jr., Indulis Rutks, Catherine E. Ryan, Paul C. Sadek, Glen P. Sandness, Richard F. Sauers, Kerin L. Scanlon, Mark S. Schaberg, Cheryl A. Scholten, William P. Schroder, Dean J. Schroeder, Mark A. Schroeder, Russell D. Sehon, Mark W. Severson, Daniel D. F. Shiao, Ruth E. Silversmith, William E. Skagerberg, Steven R. Skorich, Richard S. Smith, Min-Kyung H. Song, Thomas G. Stavros, Beatrice K. Stein, Mark A. Steine, Mrs. Vernon A. Stenger, Joseph F. Stieber, Roger W. Strassburg, Melvin P. Stulberg, Richard J. Sundberg, Glen L. Swanson, John J. Talley, Martin J. Tenenbaum, Todd C. Thompson, Steven J. Tinker, Charles A. Triplett, Gregg A. Vandesteeg, Kathryn M. Vogel, Steven R. Wann, Carolyn L. Warden, Arthur L. Watson, John B. Welch III, Edward O. Welke, Jane I. Wenger, Peter J. Wepplo, Louise M. Wheeler, Ray E. Wheeler Jr., Adeline J. Wilcox, David T. Wingfield, Ellen L. Wu, Lee R. Zehner, Tillie Zeiss, Richard T. Zera, and Ronald J. Zygmunt.

Another category of funds is memorials, and chemistry has several of these, established as remembrance of faculty members and students associated with the department. Funds and donors were: The **Robert C. Brasted Memorial Fund**: George E. Hartwell and Judson S. Pond; The **Dwight C. Legler Memorial Fund**: Mattie H. Helwig.

Programs on the part of companies to match the charitable contributions of their employees are of two-fold advantage: they stimulate private giving and simultaneously assure that corporate giving is consistent with public opinion. We thank these companies for their matches in ratios varying from one-to-one to three-to-one. Air Products, Amoco, ARCO, AT&T, BP America, Chrysler, Colgate Palmolive, Corning Glass, Cray Research, Dow, Ecolabs, First Bank Systems, General Electric, General Mills, Gillette Co., Hercules, Hewlett Packard, Hoffman-La Roche, Inc., Honeywell, IBM, Merck Sharp & Dohme, Mobil, Monsanto, Nalco Chemical Company, Northwest Airlines, Pfizer, Pitman-Moore, PQ Corp., Procter & Gamble, Rohm & Haas Co., Sandoz, Shell, Sherwin Williams Co., 3M Company, Upjohn, Wausau Insurance, and Whirlpool.

Please turn to page 19 for "We Continue to Thank you," acknowledging donors and contributors for the 1990-91 fiscal year.

We Continue to Thank You

With so many to thank, we have decided to divide this feature into two parts. The introductory explanations, and list of donors for January, 1989 to June, 1990 appeared under the heading "We Thank You" (page 18). During the fiscal year from July, 1990 through June, 1991, the following companies, foundations, and individuals continued to support the Chemistry Department. We have many annual givers, as well as some who give more than once a year, and we are very grateful to these repeat donors for their demonstration of belief in our programs.

These companies and their educational foundations provided grants during 1990-91 which were used for graduate student support in the form of academic year and summer fellowships and other special considerations: Air Products, American Cyanamid Co., Amoco, BASF, Dow Chemical Co., Dow Elanco, E. I. du Pont de Nemours & Co., Exxon, General Mills, Inc., GFS Chemicals, Glaxo Research Labs, ICI Americas, Inc., Rohm & Haas Co., 3M Company, and Union Carbide Corporation.

The **Kolthoff Fund** donors for 1990-91 were: Edward M. Carr, Gerald G. Christiansen, Johannes F. Coetzee, Guy A. Cordonier, Clifford C. Deiner, Nile N. Frawley, Charles M. Hall, Morgan R. Hallwachs, Jerry A. Herby, Albert C. Holler, Paul G. Kemp, Herbert A. Laitinen, Leo J. Laux, John J. McBrady, Jerome Margulies, James J. Markham, E. Richard Nightingale, Joseph P. Porwoll, Jumna P. Ramdular, Chiu Po-Yuen, Philip C. Price, Thomas B. Reddy, and Hsien Hau Wang.

The **Chemistry Special Projects Fund** 1990-91 donors were: Harmon B. Abrahamson, Irving M. Abrams, Courtland L. Agre, A. Karim Ahmed, Steven J. Albrechtsen, Lori A. Allaben, Carl J. Almer, Roger W. Amidon, Clifford J. Anderson, Jeffrey J. Anderson, Stephen D. Anderson, Harold J. Andrews, Charles A. Anker, John A. Anthes, Raymond L. Arnett, Madelyn Youse Babcock, Jerold O. Bahls, Keith B. Bailey, Jay S. Baldinger, Steven C. Banning, Charles E. Bartsch, Robert P. Batdorf, Wadim Batorewicz, Paul W. Baures, Willard H. Beattie, Donavon F. Beaver, Steve J. Bezuk, James M. Bierman, John H. Birely, Leonard F. Bjeldanes, William D. Blackley, Margaret R. Blake, G. Bohnert Bodem, Bruce A. Bohnen, Newman M. Bortnick, David J. Brand, Larry J. Bresina, Nicholas Brodoway, Dow E. Brophy, William E. Brown, Albert V. Buettner, Richard O. Burmeister Jr., Paul J. Cahill, Robert B. Carlin, Eugene H. Carlson, Philip A. Cartier, Tony E. Catka, Jonathan N. Chasman, Yeh M. Chow, Clayton G. Christensen, Paul J. Christensen, Koo H. Chung, Helen B. Cost, Scott H. Courtney, Ruth Crawford, Frank A. Cutler Jr., Leonard J. Czuba, Susan M. Daluge, Eugene P. Danilenko, Henry A. Daum III, Darwin D. Davis, Peter Delvigs, Howard L. Dinsmore, Diane R. Dittenhafer, Mark M. Doherty, Karen D. Donnelly, Daniel H. Doughty, Charlotte R. Drenckhahn, Howard F. Drew, Peter G. Duane, Kasmer E. Dykoski, John A. Edgar, Reuben B. Ellestad, Bentley W. Elliott, Otto C. Elmer, James M. Elvecrog, Edward A. Engman, Lori S. Enrico, Ronald J. Eshleman, Carl A. Evans Jr., Jurgen H. Exner, Ronald B. Faanes, Cheri W. Fink, Lee C. Fischer, Douglas E. Fjare, Kristi A. Fjare, Marvin W. Formo, Kay L. Franzen, Robert W. Freerksen, William P. Friday, Phillip Frisch, Daniel P. Getman, Joan L. Gill, Norman W. Gill, Bruce G. Gillespie, John M. Gleisner, Gilbert S. Gomes, David J. W. Goon, Bob G. Gower, Mary Beth Gower, Robert W. Grady, Robert S. Gremban, Rachel K. Grieger, Gregory S. Gross, Mary M. Grula, William H. Gumprecht, Cyrus O. Guss, Willa I. Guss, Frederick J. Gustafson, Arlin E. Gyberg, Kenneth E. Hafften, Brian J. Hales, David A. Halsrud, Philip D. Hammen, Charles F. Hammer, John E. Hancock, Maxine B. Hancock, Michael J. Hansel, Gordon L. Hanson, Lorin D. Hargrove, Lucille L. Hay, Thomas G. Hayes, Todd R. Hayes, Jerome R. Heiman, Walden L. Heino, Mattie H. Helwig, Henry E. Hennis, Philip B. Herman, Gerald V. Hier, Joseph H. Highland, Charles W. Hobbs, Milton L. Hoefle, Chun-I Hong, Horace E. Hood, Jerry D. Hoyt, Thomas J. Hudson, Carolyn E. Hughes, John W. Hull Jr., Steven E. Husebye, Jonathan E. Hutchins, Gary G. Irish, Henry V. Isaacson, Joel R. Jacobson, Michael Jarcho, Colin J. Jellish, Bryan M. Jewison, Eugene C. Johnsen, John A. Johnson, Kenneth E. Johnson, Roy A. Johnson, Susan A. Johnson, Thomas H. Johnson, David C. Johnston, Richard W. Joos, George T. Joyce, Kathleen Nelson Juneau, David B. Karnes, Louise E. Keough, Paul J. Killian, Wallace A. Kirkpatrick, James K. Knudsen, John G. Koland, John H. Konnert, Mark S. Kroll, Ilmar R. Kuisk, Richard J. Kvitek, Gary W. Y. Kwong, Roger W. Kwong.

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(Thank You to page 20)

(Thank You from page 19)

Donors to the memorial funds in 1990-91 were: The **Peteris Auzins Memorial Scholarship Fund**: William C. O'Mara. The **Robert C. Brasted Memorial Fund**: George R. Glaros, Arthur K. Nelson, and Judson S. Pond. The **Thomas P. Du Bruil Memorial Fund**: Eva Åkesson, Ann C. Brey, Paul D. Brey, Justine Du Bruil, Thomas W. Du Bruil, Steven R. Flom, Francis J. Haddy, Theresa Haddy, Alan E. Johnson, Denise A. McDonald, Philip S. McDonald, Virginia Osterbauer, Keisuke Tominaga, Gilbert C. Walker, Patrick K. Walsh, Dorothy A. Zeug, and James E. Zeug. The **Dwight C. Legler Memorial Fund**: Mattie H. Helwig. The **John Overend Memorial Fund**: Jo Ann K. Frank, Thomas G. Goplen, and Ronald O. Kagel.

These companies provided matches for their employee's donations in the 1990-91 fiscal year: AT&T, American Cyanamid, Amoco, Baxter, B.P. America, Inc., Burlington Northern, Cardiac Pacemakers, Inc., Colgate Palmolive Co., Corning, Inc., Cray Research, Deluxe Corp., Dow Chemical USA, Ecolab, Eli Lilly & Co., Exxon, FMC, General Electric, General Mills, H. B. Fuller Co., Hercules, Inc., Honeywell, IBM, Medtronic, Merck & Co., Mobil, Monsanto, NSP Co., PPG Industries, Pfizer, Inc., Procter & Gamble, Rohm & Haas Co., Shell Oil Co., Sherwin-Williams, SmithKline Beecham, Sun Co., Inc., Tennant, Texaco, 3M Company, Times Mirror, Union Camp Corp., The Upjohn Co., Warner-Lambert Co., and Wausau Insurance Co.

Calvin Award for Graduate Students Established

A seed donation by a faculty member and his wife, matched by his wife's employer, suggests the creation of a *Melvin Calvin Award for Outstanding Achievement in Graduate Research*, to commemorate Ph.D. thesis work by a graduate student. The graduate program committee is currently ironing out the details, and hopes to select the first winner in time for announcement in the next newsletter. In the interim, further donations by faculty and alumni are encouraged so that such an award can be given on a recurring basis. The award honors Melvin Calvin, who to the best of our knowledge, is the only Minnesota chemistry Ph.D. to win a Nobel Prize, and whose research embodied great insight and significance that crossed traditional disciplinary lines.

Professor Wayland Noland (right) with IT Dean E. F. Infante (now Vice President for Academic Affairs and Provost, left) and University President Nils Hasselmo (middle) at President's Club banquet

Recent Department of Chemistry Graduates

Congratulations to our recent degree recipients, who were granted their degrees during the period from January 1, 1989 to June 30, 1991. Columns reading from left to right are name of graduate, research advisor, thesis title and current place of employment.

Ph.D. Degrees

Daniel Albert Adsmond	Etter	*"Designing and Synthesizing Organic Crystals with Aminopyrimidine Building Blocks"*	Postdoctoral, Univ. of Minnesota, Dept. of Pharmacology, Minneapolis, MN
Susanna Amelar-Lodge	Lodge	*"Dynamical Properties of Low Molecular Weight Polymer Solutions"*	Postdoctoral, Univ. of Minnesota, Dept. of Chemistry, Minneapolis, MN
James Austin Ball	Barbara	*'The Role of Large Amplitude Modes in the Vibrational Relaxation of Matrix Isolated Aromatics"*	Postdoctoral, New York Univ., New York, NY
Jeffrey Allen Bjorklund	Leete	*"Studies on the Biosynthesis of Cocaine and Related Alkaloids in* Erythroxylum coca*"*	Postdoctoral, Univ. of Washington, Seattle, WA
John Allen Blackwell	Carr	*"Metal-Ion Modified Zirconium Oxide Based Chromatographic Supports"*	3M Company, St. Paul, MN
Gail Smith Boardman	Gassman	*"Inside,Outside Bicyclic Compounds: Syntheses of and Conversions to [N]Pyridazinophanes"*	3M Company, St. Paul, MN
John P. Bullock	Mann	*"The Application of UV-Visible and Infrared Spectroelectrochemistry to Selected Organometallic Systems"*	Air Products & Chemicals, Inc., Allentown, PA
Stephen James Burns	Gassman	*"I. Single Electron Transfer Induced Ring Opening of Fused-Ring Cyclopropyl Ethers; II. Cleavage and Bis-Functionalization of Cyclic Acetals Using Trimethylsilyl Triflate"*	Chemistry Instructor, Extension Division, Univ. of Minnesota, Minneapolis, MN
Colleen Marie Byron	Stankovich	*"The Spectral and Electrochemical Properties of Two Flavoproteins: I. Glutaryl CoA Dehydrogenase from* Paracoccus denitrificans*; II. Electron Transfer Flavoprotein from* Methylophilus methylotrophus*"*	Assistant Professor, Ripon College, Ripon, WI
Joseph Anthony Casalnuovo	Pignolet	*"Studies on the Chemistry of Gold Attached to Solid Supports and In Mixed-Metal Complexes Containing a PNP Ligand"*	Postdoctoral, Univ. of California, Davis, CA
Won-Jo Cheong	Carr	*"The Role and Effect of the Mobile Phase in Retention Mechanism of Reversed Phase Liquid Chromatography*	Postdoctoral, Dept. of Plant Pathology, Univ. of Minnesota, Minneapolis, MN
Thomas Peter Chojnacki	Gladfelter & Schmidt	*"The Formation and Reactivity of Metal Cluster/Silica Systems and Small Particles of Platinum Alloys Supported on Amorphous Silica"*	Cray Research, Chippewa Falls, WI
Paul Dominic Christian	Kariv-Miller	*"Isolation and Characterization of Electrogenerated Tetraalkylammonium-Metals"*	3M Company, St. Paul, MN
He Dai	W. Miller	*"Studies on Dynamic Properties of a Polyelectrolyte-Hyaluronic Acid"*	Boehringer Manheim, Indianapolis, IN
Sheila Sue David	Que	*"Spectroscopic Studies of Inhibitor Binding to Uteroferrin"*	Postdoctoral, Dept. of Chemistry, California Insitute of Technology, Pasadena, CA
Michael Roger Dick	Hoye	*"The Synthesis of Substituted Quinolizidines: Studies Directed Toward the Synthesis of the Marine Alkaloid, Petrosin"*	Dow-Elanco, Walnut Creek, CA
Scott Michael Donaldson	Hoye	*"The First Total Synthesis of Racemic Defferolide"*	Westinghouse, Pittsburgh, PA
Karen Dorothy Donnelly	Fristad (Hoye)	*"Manganese(III) Mediated Difunctionalizations of Alkenes"*	PPG Industries, Allison Park, PA
Martin Will Feyereisen	Almlöf	*"Large Scale Computations of Nonlinear Optical Effects"*	Postdoctoral, Dept. of Chemistry, Univ. of Utah, Salt Lake City, UT
Daniel William Firth	Barbara & K. Leopold	*"Infrared and Far Infrared Spectroscopic Studies of Malonaldehyde and Argon Hydrogen Bromide"*	Tennessee Chemical Co., Kingsport, TN
Gayle Frankenbach	Etter	*"The Preparation and Characterization of Hydrogen-Bonded Cocrystals with Applications to Materials Science"*	Procter & Gamble Co., Cincinnati, OH
Kevin Garber	Evans	*"Electrochemical and Spectroscopic Characterization of* $[Rh_2(dimen)_2(dppm)_2](PF_6)_2$ *and Survey of the Reactivity of an Electrogenerated* d^7-d^8 *Radical"*	Procter & Gamble Co., Cincinnati, OH
David Bruce Gorman	Gassman	*"The Influence of Alkyl Substitution on the Intramolecular Ionic Diels-Alder Reaction"*	Dow Chemical Co., Midland, MI
Joni Carmen Gray	Truhlar	*"Studies in Chemical Reaction Dynamics and Molecular Energy Transfer"*	Computers and Chemistry Consultant, Minneapolis, MN
Richard Thomas Haasch	Evans	*"Surface Analytical Study of Nickel Oxide and Nickel Hydroxide"*	Postdoctoral, Dept. of Chemistry, Univ. of Illinois, Champaign, IL
Robert Paul Hammer	Barany	*"New Chemistry for Solid-Phase Peptide Synthesis: Anchoring, Disulfide Bond Formation, and Coupling Methods"*	Postdoctoral, ETH, Zürich, Switzerland
Oksoo Han	Liu	*"Mechanistic Studies of the Biosynthesis of CDP-Ascarylose: Purification of CDP-6-Deoxy-*$\Delta^{3,4}$*-Glucoseen-3-Reductase (E3) and Characterization of its NADH Oxidase Activity"*	Assistant Professor, Dept. of Genetic Engineering, Cheonnam National Univ., Korea
Kurt Christopher Hermann	Lodge	*"Solution Characterization of Macromolecules by Neutron Scattering, Capillary Viscometry, and Oscillatory Electric Birefringence"*	Procter & Gamble Co., Cincinnati, OH
Paul W. Hladky	Prager	*"Contact Line Tension of Dilute Polymer Solutions at the Theta Temperature"*	Assistant Professor, Dept. of Chemistry, Univ. of Wisconsin, Stevens Point, WI
Theodore Russell Holman	Que	*"Physical and Spectroscopic Studies of Bimetallic Inorganic Complexes"*	Postdoctoral, Harvard Univ., Cambridge, MA
Larry Noboru Ito	Pignolet	*"The Synthesis, Characterization, and Reactivity of Heterobimetallic Gold Cluster Complexes of Platinum and Palladium"*	Dow Chemical Co., Midland, MI
Scott Jenkins	Hoye	*"Studies of Oligomeric Tetrahydrofurans and the Total Synthesis of Teurilene"*	Sandoz Crop Protection, Palo Alto, CA

Thomas Henry Jozefiak	L. Miller	*"I. The Anodic Oxidation of 1,3-Benzodithioles; II. The Synthesis and Properties of Polyacenequinone Anions"*	Postdoctoral, Dept. of Chemistry, California Institute of Technology, Pasadena, CA
Carlos Humerto Juarez-Garcia	Münck	*"Mossbauer and EPR Studies of* E. Coli *Ribonucleotide Reductase and $Fe^{III}M^{II}$ (M^{II} = Cu, Ni, Zn) Model Complexes"*	Tennessee Chemical Co., Kingsport, TN
Tai Jong Kang	Barbara	*"The Influence of Solvent Dynamics on Ultrafast Chemical Reactions in Solution"*	Postdoctoral, Univ. of Texas, Austin, TX
Nancy Geralyn Kneib-Cordonier	Barany	*"Synthesis and Characterization of a Tris(alkoxy)benzylamide Handle and its Application to the Solid-Phase Synthesis of Peptide Amides"*	Postdoctoral, Baylor College of Medicine, Houston, TX
Robert Scott Koefod	Mann	*"A Study of Cyclopentadienylruthenium (II) Complexes of Highly Fluorescent Arenes"*	Postdoctoral, Univ. of Illinois, Urbana, IL
Chad J. Kolaskie	L. Miller	*"Electrochemically Driven Ion Transport in Conducting Polymers and Skin"*	E. I. du Pont de Nemours & Co., Waynesboro, VA
Ann Therese Kotchevar	Kreevoy	*"Solvent Dynamics of Hydride Transfer Between NADH Analogues"*	Postdoctoral, Pennsylvania State Univ., University Park, PA
Paul Francis Korkowski	Hoye	*"Synthetic and Mechanistic Studies of Reactions of Organometallic Carbene Complexes with Enynes"*	3M Company, St. Paul, MN
Changjin Lee	Gassman	*"Electrochemical Reductive Cyclization of a,β-Unsaturated Carbonyl Compounds"*	Korea Research Institute of Chemical Technology, Taijon, Korea
Kaidee Lee	Lipsky	*"The Photoionization of N,N,N',N'-Tetramethyl-P-Phenylenediamine (TMPD) in Nonpolar Liquids"*	Brookhaven National Laboratories, Long Island, NY
Gaye Lehman	Kariv-Miller	*"Electroorganic Reductions at High Negative Potentials and Ammonium-Mercury Formation and Characterization"*	3M Company, St. Paul, MN
William Robert Leonard	Hoye	*"The Use of (Phenylseleno)-Alanes and -Boranes in a Tandem Aldol Condensation–Free-Radical Addition Annulation and a 1-Acylethenyl Anion Equivalent"*	Postdoctoral, Colorado State Univ., Fort Collins, CO
David Michael Loffredo	Kariv-Miller	*"Electroreductive Formation of Tetraalkylammonium-Metal Composites, and Application to the Reduction of Organic Compounds"*	Argonne National Labs, Argonne, IL
Franco Lombardo	Kariv-Miller	*"Synthetic and Mechanistic Aspects in the Electroreductive Mono and Tandem Cyclization of Ketones"*	Merck, Sharp & Dohme, Rahway, NJ
John Brian Lynch	Que	*"The Dinuclear Iron Center and Tyrosine Radical of the Ribonucleotide Reductase B2 Subunit from* E. coli*: Spectroscopic and Chemical Studies"*	W.R. Grace & Co., Columbia, MD
Laurie Ellen Lynch	L. Miller	*"Electrochemically Controlled Transport Across Polyvinylchloride Membranes"*	E. I. du Pont de Nemours & Co., Wilmington, DE
Rita Szczepanski King Majerle	Hoye	*"The Total Synthesis of N-Benzoylated Actinobolin Amine: Studies Toward the Synthesis of Actinobolin and Bactobolin"*	Assistant Professor, Dept. of Chemistry, South Dakota State Univ., Brookings, SD
Daniel Robert Mantell	Gladfelter	*"Reactions of Nitrite and Azide with Mono- and Polynuclear Metal Carbonyls. Organometallic Azides as Precursors for the Low Temperature Chemical Vapor Deposition of Aluminum Nitride Thin Films"*	Polaroid Corp., Cambridge, MA
Vaughn Paul Miller	Liu	*"I. CDP-6-Deoxy-$D^{3,4}$-Glucoseen Reductase: Enzyme Purification and Mechanistic Studies, II. Studies of the Mechanistic Diversity of Sodium Cyanoborohydride Reduction of Tosylhydrazones"*	Postdoctoral, Univ. of California, San Francisco, CA
Jeffrey Thomas North	Hoye	*"Synthesis of Substituted 1-Oxaquinolizidines: Studies Directed Toward the Synthesis of the Marine Aklaloid Xestospongin A"*	Bristol-Myers Squibb, Princeton, NJ
Gretchen Mary Rehberg	Hoye	*"Synthetic and Mechanistic Studies of the Reactions of Fischer Carbene Complexes with Enynes, Alkenes, and Alkynes"*	Postdoctoral, ETH, Zürich, Switzerland
Richard James Riehle	Gassman	*"Carbocationic Macrocyclizations Using Vinylcyclopropanes and Allyl Cations"*	Hercules, Inc., Wilmington, DE
Martin Peter Rigney	Carr	*"The Development of Porous Zirconia as a Support for Reversed-Phase High-Performance Liquid Chromatography"*	Ecolab, Inc., St. Paul, MN
Christopher Ryan	Kariv-Miller	*"Electroreductions at Highly Negative Potentials and Formation of Tetraalkylammonium-Mercury Solids"*	H. B. Fuller Co., St. Paul, MN
Vasgen Aram Shamamian	Gentry	*"State Resolved Rotational Excitation Dynamics of Iodine and para-Difluorobenzene in Collisions with Helium"*	Sandia National Laboratories, Albuquerque, NM
Andrew G. Sykes	Mann	*"Synthesis, Reactivity, and Electronic Spectral Properties of Iridium 1,8-Diisocyanomenthane Complexes Containing Group IB Coinage Metals"*	Postdoctoral, California Institute of Technology, Pasadena, CA
Gnanarasa Thambo	W. Miller	*"The Conformation and Dynamics of Polymers at Solid Interfaces"*	Postdoctoral, Lehigh Univ., Bethlehem, PA
Thanh Nguyen Truong	Truhlar	*"Dynamics of Gas Phase and Gas-Solid Interface Reactions"*	Postdoctoral, Dept, of Chemistry, Univ. of Houston, Houston, TX
Susan Cobb Tucker	Truhlar	*"A Golden Rule Method for Resonance Decay and Microsolvation Effects on an S_N2 Reaction"*	Assistant Professor, Chemistry Dept., Univ. of California, Davis, CA
James Russell Valentine	L. Miller	*"Cation Transport in Electrically Conducting Polymer Composites"*	Postdoctoral, MIT, Cambridge, MA
Gail Mashek Vojta	Etter	*"A Solid-State NMR and Crystallographic Study of Beta-Di- and Tri-Ketomethanes"*	Assistant Professor, Dept. of Chemistry, Grinnell College, Grinnell, IA
Mark Westling	Livinghouse	*"The Synthesis of Nitrogeneous Heterocycles via Silver Mediated Cyclization of Alpha-Ketoimidoyl Chlorides: An Application to the Synthesis of the Erythrina and Dendrobine Alkaloid Skeletal Systems"*	Vector Labs, Burlingame, CA
Carl Thomas Whalen	Kariv-Miller	*"Electrochemical Reduction of Aliphatic Chlorides and Substituted Aliphatic Chlorides at Lead and Mercury Electrodes"*	Chemical Abstracts Service, Columbus, OH
Theresa Marie Weigel	Liu	*"Mechanistic Studies of the Biosynthesis of CDP-Ascarylose: Purification and Characterization of CDP-4-Keto-6-Deoxy-D-Glucose-3-Dehydrase"*	Postdoctoral, Merck Sharp & Dohme, Rahway, NJ
Yihua Yue	W. Miller	*"Polymer Latices, Especially the Formation of Ordered Monolayers by Spin Coating"*	Postdoctoral, Dept. of Chemistry, Univ. of Toronto, Ontario, Canada

Samuel Gerard Zeller	Gray	*"Analysis by the Reductive-Cleavage Method of Acidic Polysaccharides and Those Containing Non-Carbohydrate Substituents"*	Kelco, San Diego, CA
Meishan Zhao	Truhlar	*"Quantum Theory of Chemical Reaction Dynamics"*	Research Associate, Dept. of Chemistry, Univ. of Chicago, Chicago, IL
Xin Gui Zhao	Truhlar	*"Chemical Dynamics of Energy Transfer Collisions and Reaction of Microhydrated Ions"*	Research Associate, Fuel Science Program, Dept. of Materials Science and Engineering, Pennsylvania State Univ., University Park, PA

M.S. Degrees

Mariquita Auro Accibal	Gladfelter	*"Comparison of Several Cu(I) and Cu(II) Precursors for the Sol-Gel Preparation of High T_c Superconducting Metal Oxides"*	Geo-Centers, Inc., Newton Center, MA
Gregory James Anderson	Noland	*"Synthesis of Precursors to Isatogen-like Complexes Containing Six- and Seven- Membered Rings"*	H.B. Fuller Co., St. Paul, MN
Steven Balaban	Pignolet	*"Phosphine Exchange Reactions of Organogold Compounds and a Mixed-Metal Gold Cluster"*	Chemical Abstracts Service, Columbus, OH
Ann Marie Brooks	Leete	*"Studies Involving the Alkaloids of* Dendrobium Pierrardii*"*	Abbott Labs, Abbott Park, IL
David Lloyd Cochrane	Truhlar	*"Simulation Methods for Molecular Collisions: Parallel Algorithms and Quantum Effective Potentials"*	Teaching position, DeLaSalle High School, Minneapolis, MN
Haozhe Dong	Truhlar	*"State-to-State Reaction Dynamics, Energy Transfer, and Scattering in Collisions of Hydrogen and Deuterium Atoms with Hydrogen Molecules"*	Research Assistant, Dept. of Electrical Engineering, Univ. of Minnesota, Minneapolis, MN
Christine E. Eastman	Lodge	*"Polymer and Probe Diffusion in Viscous Solutions by Forced Rayleigh Scattering"*	Graduate Student, Dept. of Chemistry, Univ. of Minnesota, Minneapolis, MN
Randolph Scott Ford	K. Leopold	*"Rotational Spectroscopy of Argon-Acetonitrile and Acetonitrile-Boron Trifluoride"*	Teaching position, Scott Community College, Bettendorf, IA
Kent E. Hubbard	L. Miller	*"Thiophene Oligomers"*	Larsen Company, Green Bay, WI
Todd A. Keith	Moscowitz	*Plan B*	Graduate School, Dept. of Chemistry, McMaster Univ., Hamilton, Ontario, Canada
Dennis Hughes Kelly	Hoye	*"Studies Directed Toward a Synthesis of Optically Active A-Factor"*	Merck & Co., Rahway, NJ
Mary Elaine Landgrebe	Leete	*"Studies on the Biosynthesis of the Tropane Alkaloids"*	3M Company, St. Paul, MN
Nancy D. Lenn	Liu	*"Mechanistic and Electron Transfer Properties of General Acyl- and Butyryl-CoA Dehydrogenase"*	Laboratory Supervisor, Macalester College, St. Paul, MN
Sandra Lynn Mueller	W. Miller	*Plan B*	Graduate Student, Dept. of Chemical Engineering and Materials Science, Univ. of Minnesota, Minneapolis, MN
Phillip Joseph Ruhoff	W. Miller	*"The Study of Wet Adhesion Using Modified Acrylic Polymers"*	Valspar Corp., Minneapolis, MN
June Ellen Russell	Gassman	*"Science and Science Education in the United States"*	Not available
Kirby Joseph Scott	D. Leopold	*Plan B*	Anoka Ramsey Community College, Coon Rapids, MN
Wes Schafer	Carr	*"The Use of Zirconium Oxide Sorbents in the Separation of Biological Compounds"*	Merck & Co., Rahway, NJ
Sharon A. Sechrist	Noland	*"I. The Reactions of Nitromethane and Ketones with Basic Catalysts II. Synthesis and Characterization of Four Z:Z Condensation Compounds from Nitromethane with Aliphatic Ketones (original research)"*	Teaching Position, Minneapolis Community College, Minneapolis, MN
Steven John Severtson	Barbara	*Plan B*	Graduate School, Georgia Institute of Technology, Atlanta, GA
Ihab Ibrahim Slaieh	Barbara	*Plan B*	Deceased
Daniel Chin-To Siu	Que	*"Spectroscopic Studies of Protocatechuate 3,4-Dioxygenase from* Brevibacterium fuscum*"*	Cetus Corp., Alameda, CA
Trina Overgaard Toups	W. Miller	*Plan B*	Not available
James Melton Wilkinson	Gentry	*"Velocity Slip in an Ultra Cold Molecular Beam"*	Not available
Bede Daniel Willenbring	Evans	*"A Temperature-Programmed Desorption Study of Polar Molecules Sorbed into Nafion Thin Films"*	H.B. Fuller Co., St. Paul, MN
Min Xie	W. Miller	*"Structure and Dynamics of Microemulsions Using Nuclear Magnetic Resonance"*	Dallas Research Laboratories, Dallas, TX

Bachelor's Degrees with a major in chemistry were granted during this same period to:

Michael Mark Ahern, Mohd Rais Ahmad, Keith Allen Anderson, Kraig Knute Anderson—*with high distinction*, Robert Neil Anderson, Nicholas Armstrong—*summa cum laude*, Raphael Dean Bartz, Deborah Sue Berner, Susan Jean Blank, Rande Ann Brockberg, Delia Marie Brownson, Ira Budisusetyo, Elizabeth Ann Byron, Sally Ann Carlson, Christopher Al Chapman, Sarah Ann Cherney, Daniel Christen—*summa cum laude*, Matthew Christian Comstock—*with high distinction*, Gary Dennis Cromer, Chuong Tran Dang, Daniel John Dyer, Lori Suzanne Enrico, Dean Powell Fairbrother, Kurt Frederick Fischer, Nancy Fridlund, Gregory Bernar Gadbois—*with high distinction*, Barbara Jane Gehrke, Howard David Goldberg, Ann Lisabeth Haseman, Wendy Sue Hasselblad, Robin Lee Hauschulz, Stacy Kay Henle, Thuy Anh Thi Hoang, Michelle Ann Hursh, Alan Carl Hutson, Monell Emmelyn Jakel, Lisa Marie Jahnke, Patrick J. Jansen—*with high distinction*, Charles Edward Jasicki, Douglas Scott Johnson—*summa cum laude*, Amy Eleanor Kaphingst, Paul Werner Kariniemi, Kenneth Lee Kelly, Paul James Killian, Steven James Kivi, Vippra Knowles, Lisa Marie Cyr Konkel—*with high distinction*, Kari Anne Kretchman, Kimberly Ann Kriesel, Garrett James Krueger, Ha Thanh Lam, Peter Ambrose Lander, Sharon Langenberger, Anastasia Lay Lim, Yilan Ling, David John Magnuson, Lisa Jean Malecha, Elham Malekkhosravi, John Peter Maney, William Ambro McCarthy, David Allen McIntyre, Genevieve McJilton, Charles Miller, Kathleen Jean Moran, Brian Motzko, Jeffrey John Murphy, Nancy Katherine Nelson, Mai Ngoc Nguyen, James Craig Novack, Cindy Sue Olson, Allyn Corey Ontko, Mark William Paetzel, Brian Lee Pagenkopf, Larry Kenneth Pearson, David Anthony Peters, James Peterson, Debra Pilger, Stephen Day Ponto, Kenneth Price, Peter Michael Radford, Darrell K. Rahn—*cum laude*, Maureen Lisa Rath, James Chester Reimer, Kurt David Requa, Julie Ann Robertson—*cum laude*, James Lyle St. Mary, Jane Helen Sandahl—*with high distinction*, Kimberly Ann Sandrock, Paul Frazer Schacht, Gregory G. Schmidt, Patrick David Schneider, Stephany Schneider, Mark Edward Seeley, Lawrence Brandon Sentell, Rebecca Ann Smith—*cum laude*, Jason Ryan Stenzel, Lian Soon Tan, Michael Dean Taylor, Wendy Lee Thompson, Allen Edward Thomsen, Binh Van Tran, Thu-van Thi Tran—*with high distinction*, Saurabh Surend Trivedi, Trang Thuy Vo-Nguyen—*summa cum laude*, Mark David Weigel, Nikolaos D. Willmore, Paula Kathleen Wittmayer—*magna cum laude*, and Mohammad S. Zia-Ebrahimi.

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Minnesota Alumni Active in Project SEED

Project SEED is the social action program of the American Chemical Society. It seeks to help economically disadvantaged high school students become connected with career opportunities in chemistry and other sciences. Former Minnesota chemistry graduate students have played major roles in the program at the national level.

From 1985 to 1990, the eight member society committee on Project SEED, which administers the program, included four who had done at least part of their graduate work in the Chemistry Department at Minnesota: Edwin T. Harper (Ph.D. '59, W. E. Parham), Jeannette Brown (M.S. '58, C. F. Koelsch–see Alumni Reports *section), Ray O'Donnell (who worked with Edward Meehan) and David G. Bush (M.S. '50). In addition, Jeannette Brown chaired the committee from 1986–1988, and Ed Harper is the current committee chair.*

This patently non-statistical correlation presumably indicates that the Chemistry Department either attracts students with strong social consciences, or stimulates the social commitment of those who come for graduate study. Either way, the department can be pleased to have had such an important influence in this valuable program.

The University of Minnesota is an equal opportunity educator and employer.

Minnesota Chemists Newsletter
c/o Gladys Olson
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