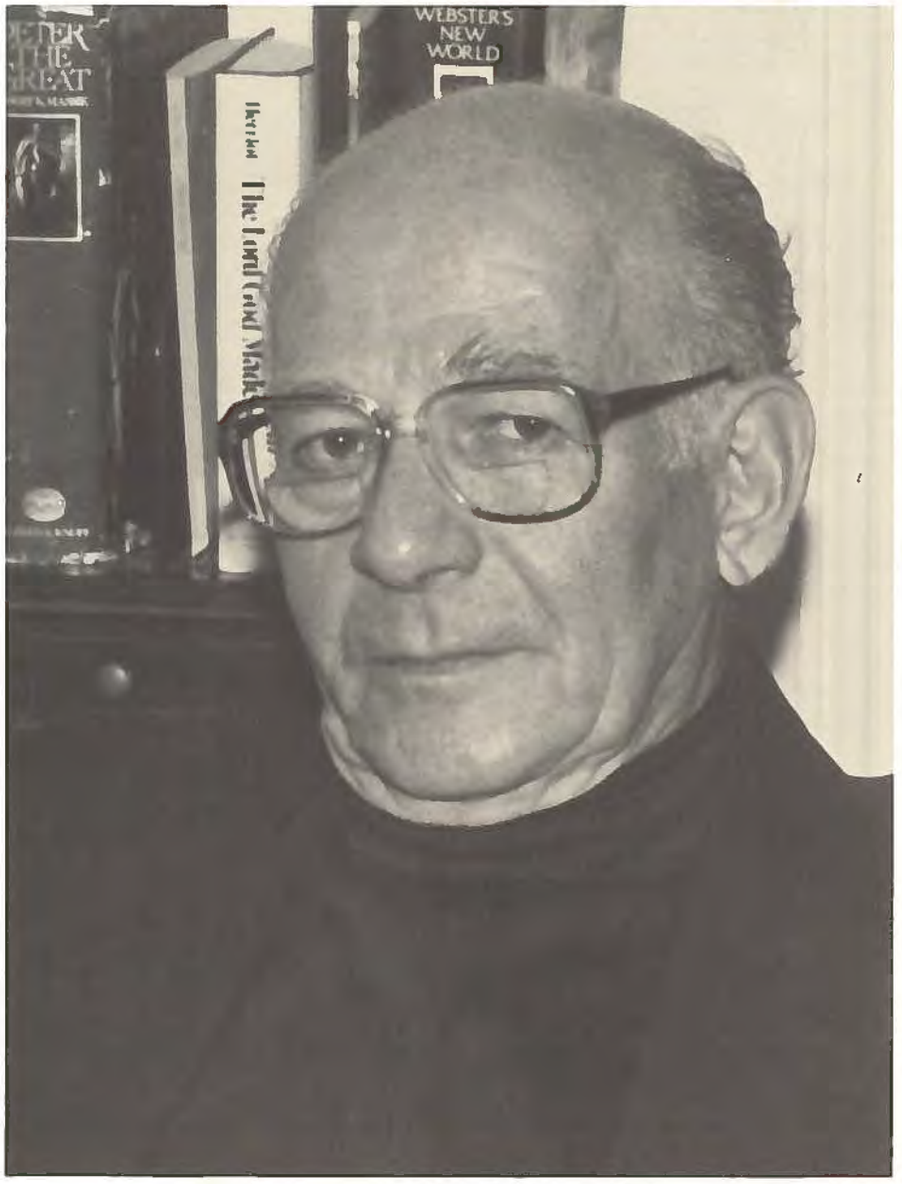
University of Illinois at Urbana-Champaign

#24 Spring '89

Alumni Newsletter

School of Chemical Sciences

Among our Outstanding Alumni: Don Felley of Rohm and Haas



The 37 years he spent with Rohm and Haas were perhaps "the most interesting and exciting years in the chemical industry", according to Don Felley. He should know since he spent his entire career with the company, rising from technical representative in the Special Products Sales Department to President and Chief Operating Officer. A large fraction of his time was spent abroad and his home holds countless art treasures that he has collected on his travels and that he finally finds time to enjoy.

Don Felley is from the South, a native of Memphis, Tennessee, a graduate of Arkansas State College and of a four year stint in the U.S. Army. By the time he was discharged in 1946 he knew that his career lay in organic chemistry. He came to Illinois because it was recognized as one of the outstanding organic chemistry departments in the country with Marvel, Fuson, Adams, and Snyder among its stars.

Student Days Post WWII

He remembers most of his classmates as returning veterans, more mature and serious than the average student but also somewhat rusty in the techniques of studying. "It was a very challenging time", he said, "not just in chemistry but also for the Illini." The year after he began graduate studies, the Rose Bowl pact was initiated with the Pacific Coast conference. The U. of I. won by 45 to 14 even though the UCLA team was favored. Since then, the Illini have been back to the Rose Bowl only twice and won once.

With the G.I. Bill paying tuition, fees, and a barely adequate living allowance of $109 per month, Felley completed his Ph.D. with Professor Nelson Leonard in three years. He lived at AXΣ with a very compatible group of men, among whom he made lifelong friends. He was somewhat surprised that the AXΣ has become coed because, in his day, women were allowed on the premises only on special occasions, and only on the first floor or on specially conducted tours.

The G.I. Bill was "a little short for a high life style" but enough for a good many beers at Prehns (predecessor of Trenos). One oldtimer described Prehns as the place with the beer labels on the ceiling. Evidently the customer would remove his beer bottle label and put it, glue side up, on his wallet, then throw the wallet at the ceiling. With practice he could get his wallet back, while the label stuck to the ceiling. Rumor has it that pickle slices could be and were attached to the ceiling in like manner.

The Move to Rohm and Haas

The day after he graduated in 1949, Don Felley got married and three weeks later he started his lifelong career at Rohm and Haas. He had had other offers and Rohm and Haas offered the lowest starting salary but, as he says, "I was impressed by the quality of the people and the atmosphere. There was a sense of camaraderie. It was a smaller, more congenial place to be, and it already had a great many Illini."

He felt very comfortable with the business philosophy of Rohm and Haas. The company relied on a technically trained sales force to develop new markets for organic chemicals. Rohm and Haas started in the leather chemicals business and branched out into textile finishing and agricultural and other industrial chemicals.

The company's key raw material building blocks were acrylate monomers, used to develop acrylic emulsions for paint, leather and textile finishes, etc., and methacrylate monomers, which were initially principally used in the manufacture of Plexiglas acrylic plastic. Most Rohm and Haas products were not sold to the end user but to the manufacturer—of shoes, of paints, of aircraft—who used the chemicals to produce superior final products.

Felley spent much time in his early years trying to interest oil and mineral companies in a line of products called amines, which had corrosion inhibiting and other properties that would have been helpful in oil recovery and production and in ore treatment. Unfortunately, in those days of low oil prices, that product line was hard to sell.

Increasing Managerial Responsibilities

In 1957, Felley was offered the position of assistant manager of the Rohm and Haas subsidiary in France, called Minoc. This began what he calls "the most exciting part of my career." He lived in Paris, "a hardship post", and built the first units of what is now the enormous chemical plant at Lauterbourg on the Rhine in the Alsace. He arrived just when the European Common Market started. It was an expansionist time for American markets and everything was booming. In recognition for his achievements, the management of the Lauterbourg plant dedicated a plaque to Felley in 1985, which is affixed to the first building in the complex.

Felley returned to the U.S. in 1964 as assistant general manager of the Foreign Operations Division which included Italy, England, Scandinavia, Spain, South America, Canada, Japan, South Asia and Yugoslavia, among others. Rohm and Haas has always been a very international company, having its beginnings as Rohm and Haas, Darmstadt, in Germany. A large portion of its business and an even larger portion of its profits continue to come from outside the U.S.

Until 1968 he remained Assistant General Manager of Foreign Operations. At that time he was made Vice President and Production Manager of the Chemicals Division. In 1971 he was elected to the board of directors of the company and became general manager of the International Division. In 1976, following a compaay wide reorganization Felley became regional director for North America. In 1978, he was named company president and COO, the company's first Chief Operating Officer. He remained in these posts until his retirement in 1986.

Environmental Concerns Change Chemical Industry

Looking back, he thinks of his 37 years as "a good time to be involved." In recent years, the growth of the U.S. chemical industry has slowed compared to the heyday postwar years, and the industry has been increasingly preoccupied with environmental, waste disposal and industrial health problems. Before he retired, a large fraction of his time was devoted to these matters, which are clearly important but less exciting than devising new chemicals and new market outlets.

Although he thinks that the chemical industry must and does address environmental and health problems vigorously, he also thinks it is being blamed unfairly today for practices that were considered state-of-the-art 20 to 30 years ago. For example, although waste disposal practices were considered outstanding at the time, and disposal sites were generally recommended and approved by government authorities, the companies are being blamed today for the problems resulting from these practices.

For these reasons the glamour and public image of the chemical industry are not what they once were, and chemistry may not be as attractive to young students as it was 30-40 years ago. Nevertheless, as Felley says, "It is still a viable and growing business, with scientifically challenging problems and absolutely essential to the maintenance and growth of our place in the world economy."

Contributions to his Community and Alma Mater

After he came back to the United States, Don Felley became involved in many organizations and activities on behalf of Philadelphia and, lately, on behalf of the U. of I. For instance, he has served on the Philadelphia Chamber of Commerce, The Philadelphia World Affairs Council, and the Greater Philadelphia First Corporation. He is still chairman of the Pennsylvania Horticultural Society and president of the Neighborhood Gardens Association, a land trust devoted to conserving open space for community gardens in the inner city. He is also on the executive council of a 60 year old French honorary society called the Maison de la Chimie, which provides conference and exposition facilities for the chemical industry and others.

He has been part of the U. of I. National Network and took on the chairmanship of the Philadelphia Section during the Campaign for Illinois. His drive and talent contributed significantly to the success of the Campaign for Illinois in the Philadelphia area. Currently, he serves on the board of the University of Illinois Foundation and is chairman of its nominating committee.

In every sense, Don Felley is a man of great stature. The School of Chemical Science is fortunate that we can count him among our outstanding alumni.

Highlights Spring '89

The X-ray Crystallography Lab is a Gem

From those who use its services, the School of Chemical Science X-ray crystallography lab receives high marks for sophisticated, efficient analyses. Dr. Scott Wilson, the lab's director, and his assistant, Charlotte Stern, preside over an array of equipment, including two diffractometers, a VAX 750 mainframe computer, two DEC workstatioas, and an IBM 5080 graphics system along with a color printer.

The new diffractometer, a Nonius CAD-4, joined the lab only within the past year. Before that, a Syntex P21 with a Data General Eclipse Computer had been the data collecting workhorse of the laboratory. Today, the Syntex has been upgraded and hooked up to the VAX. The lab is supported by the School budget and by user fees and is used largely by organic and inorganic chemists and occasionally by others in the university community, such as geologists and materials scientists.

Dr. Iain Paul, a crystallographer who is closely associated with the lab says with pride. "Ours is a state-of-the-art diffractometer and computer equipment. The lab operates efficiently aad vigorously in providing an extremely valuable service to the faculty."

Over the 9 yenrs of its existence, the lab has seen many changes reflecting developments in the field. When he first came to the U. of I., Scott remembers that he could complete one crystal structure per month; today the lab completes 8 in that period of time.

Much of the difference can be attributed to the improvement in computer technology. Today, the computer, not the staff, perform the myriad computations required to analyze crystalline structures. Commercial software is available and can be adapted to meet the needs of the lab. The staff can concentrate on the intuitive, scientific aspects of the analyses and they work closely with faculty to tailor individual projects.

The Lab's Service

A crystal is mounted in a diffractometer and rotated in a focused X-ray beam. The locations of the diffracted X-rays are collected directly by computer. Before modern instrumentation, the data were collected on photographic plates and the investigator ruined his eyesight, studying light flecks on negative strips that indicated the position of the diffracted X-rays. The method was not merely hard on the eyes; it was also far less accurate because it required sophisticated analysis with few data points.

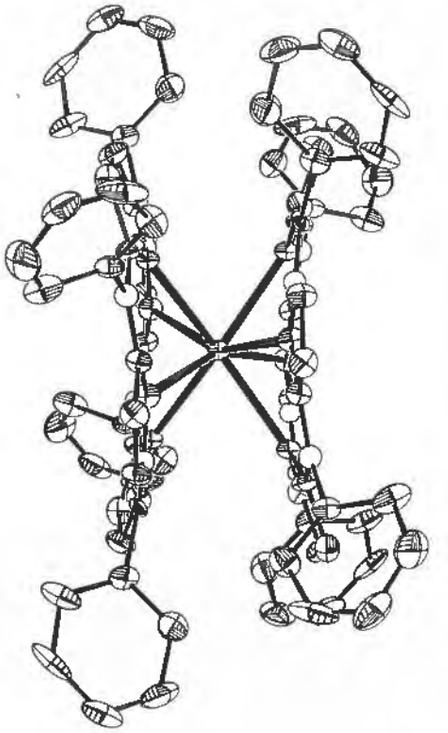
Today, the computer automatically collects thousands of data points which are then analyzed to determine the position of atoms, their thermal motion, bonding distances and bonding angles, van der Waals interactions, intermolecular interactions, torsion angles, and angular distortions, to name a few.

These data provide information (1) to determine the atomic structure of natural products, (2) to establish the geometric parameters for novel organometallic compounds, (3) to provide speedy confirmation of the structure of synthetic intermediates, and (4) to function as a valuable, non-invasive probe for determining the environment in which solid state reactions take place in organic crystals.

Within two weeks after data collection is completed, the researcher receives a preliminary report on the probable crystalline structure. The final report, which is literally a book, provides very detailed quantitative information on the arrangement of atoms , which, as Wilson points out, "allows you to predict catalytic information of the substance and the function of biologically active materials." One of the more recent uses of X-ray diffraction is to study the arrangement of atoms in superconducting materials and to aid scientists to grind correct faces on synthetic crystals.

An Illustration

As an example of the type of work performed by the laboratory, Wilson described his work for chemistry professors Suslick and Girolami on the X-ray crystal structures of new metallaporphyrins. Metallaporphyrins are vitally important in nature and are present in hemoglobin and chlorophyll, for example. Recently, Suslick, Girolami, and graduate student Stanley Milam prepared several new metallaporphyrins that consist of two porphyrins attached to a metal instead of one. These new compounds structurally resemble a naturally occurring molecule that is important in photosynthesis. The detailed structures of Suslick's and Girolami's compounds were determined by the X-ray crystallography staff. This work mny lead to a better understanding of how plants use the energy of sunlight to make food.



The work of the lab has important teaching as well as research implications. With the IBM 5080, crystalline structures can be visualized in attractive color graphics that illustrate the various characteristics. For instance, an atomic structure can be shown at different temperatures, demonstrating the rotation of atoms in different thermal environments. Such slides and transparencies become excellent teaching tools to illustrate fundamental principles of chemistry.

Scott Wilson is a diffident but dynamic director of the lab. Faculty users appreciate his meticulous reports which free them to carry out fundamental science. Yet he finds time to coach the girls' soccer team at a local high school and takes as much pride when his team wins on the soccer field as in the chemistry community.

Chemistry Teachers Honor Elizabeth Rogers

On her retirement, the Illinois Association of Chemistry Teachers presented Dr. Rogers with a plaque *In appreciation for many years of dedicated service.... (and) acknowledges (her) as a distinguished teacher of chemistry.*

In turn, Dr. Rogers applauds the dedication of Illinois chemistry teachers as they share their enthusiasm for science with their students. As she knows from her own teaching experience, a career is often chosen because of the inspiration of an enthusiastic, knowledgeable teacher at the high school level. To coax youngsters to choose chemistry is particularly difficult because science in general and chemistry in particular are not thought of as easy subjects in which to excel. And in the isolation of smaller high schools where one person may be the entire science department, it is difficut to maintain enthusiasm.

During much of her career at Illinois, Dr. Rogers taught the introductory chemistry course. In an effort to correlate this course with what the high schools were teaching she carried out a survey of Illinois high school chemistry courses. In sharing the results of this survey with the respondents, Dr. Rogers came to know and to admire many of them and to become involved with the Illinois Association of Chemistry Teachers.

Later, Dr. Rogers visited chemistry classes in many of the high schools surrounding Champaign/Urbana and in secondary schools around London. From these visits she became aware of the difficulties high schools face in staffing their science classes with well trained science teachers. She also learned of the professional isolation of science teachers in small high schools where one person is often the entire science department.

As a result of these studies, she persuaded the U. of I. chemistry department to host a yearly conference of high school chemistry teachers. Originally, a half-day meeting held in conjunction with Engineering Open House, the conference has now grown into a full day meeting and is attended by chemistry teachers from all over the state. A important offshoot of these meetings has been an improved relationship between the U. of I. Chemistry Department and high school chemistry teachers throughout the state, as well as increasing numbers of chemistry majors entering the U. of I. from top flight, in-state schools.

In addition to teaching and fostering this relationship with the high schools, Dr. Rogers has written three texts: a combined lab book/study guide to use in introductory chemistry, an introductory chemistry text, and, with William H. Brown of Beloit College, a general, organic and biochemistry text for students preparing for careers in allied health professions such as nursing, physical therapy and dental hygiene. She is at present working on the fourth edition of the general, organic and biochemistry text.

One of her colleagues describes her "as a pioneer" in reaching out to high school teachers. As he points out, the chemistry profession has only recently recognized the importance of providing quality education in science at the secondary and even at the elementary school level. The American Chemical Society, which played a small part in supporting Dr. Rogers by assisting her work through the University of Illinois section, has begun programs which address the issues which Dr. Rogers recognized many years ago as critical to the future of chemistry.

"I have admired her efforts," he said, "because she was focusing on problems that all chemists should be concerned with. Elizabeth Rogers was years ahead of her time and it is to be hoped that we can build on the initiatives she made to help chemistry teachers and students."

Elizabeth Rogers will be missed, not just as chairman of the annual conference, but also as a "distinguished" teacher and strong supporter of chemistry teachers throughout the state.

Drickamer Retirement Symposium

To honor Professor Harry G. Drickamer on his retirement from the U. of I. after more than 40 years of service, the School of Chemical Sciences hosted a Symposium on May 5, 1989. The *H.G. Drickamer Symposium on Condensed Phase Science and Engineering* was organized to recognize the world renown pioneer in pressure tuning spectroscopy. Because of the wide ranging applications of his techniques, the symposium was sponsored by the departments of Chemical Engineering, Chemistry, and Physics and the Center for Advanced Study, where Professor Drickamer is a permanent member.

Speakers at the symposium included Professor D. Hershbach of Harvard, Dr. J. Sinfelt of Exxon, Dr. G. Samara of Sandia National Laboratories, and Professors C.P. Slichter, H. Frauenfelder, P. Wolynes, J. Jonas, and N. Holonyak of the University of Illinois. In addition, a special issue of the *Journal of Physical Chemistry* will be devoted to a *festschrift* in his honor.

Professor Drickamer is a member of the National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences, a member of the American Philosophical Society, and a member of the National Academy of Engineering. Among his numerous honors and awards are the Oliver Buckley Prize in Solid State Physics in 1967 and the Irving Langmuir Award in Chemical Physics in 1974. He won the first P.W. Bridgman Award in 1977, the Michelson-Morley Award in 1978, and the Scott Award in 1984. In 1987 he won the Peter Debye Award in Physical Chemistry as well as the Robert A. Welch Award and in 1988 he received the Elliot Cresson Medal.

Marvel Bust Dedication

Thanks to the generosity of the Du Pont Company, a sculpture of C.S. (Speed) Marvel by Charles Parks, is housed in the Organic Seminar Room, renamed the Marvel Room. The sculpture is a gift of the Du Pont Company where Marvel consulted for more than 50 years.

The formal dedication was held on May 8 with talks by Dr. Richard Heckert, Chairman and CEO of Du Pont, Clayton Callis, President of the American Chemical Society, Burt Anderson, Technical Director, Fabricated Products Department of Du Pont, and Jack Marvel, Vice President, Research and Development of the Ethyl Corporation and son of Professor Marvel. The Bust Dedication was held in conjunction with the seventh Annual Marvel Lecture Series, presented this year by Professor Samuel Danishefsky of Yale University.

Professor Marvel taught at Illinois for 41 years and served as research advisor to more than 300 students and postdoctoral fellows, many of whom later rose to prominent positions in American chemistry. He was a pioneer in polymer chemistry, a noted teacher and an enthusiastic ornithologist. Marvel served as president of the American Chemical Society, was a member of the National Academy of Sciences and the recipient of numerous awurds and honors including the National Medal of Science in 1986.

Gil Haight Went Out with a B • A • N • G

Resplendent in Santa red vest and oversize red and gold bow tie, Professor Gil Haight gave his last annual Christmas lecture as a farewell to colleagues and friends. The Christmas lecture is a tradition borrowed from the Royal Society of London. The London lectures varied in theme, depending on the latest discoveries in science. The Haight lecture is based on a discussion of the atmosphere. Among his amusing commentaries are a variety of suggestions of what will happen when the sun runs out of energy and the world becomes a **co-o-o-old** place.

Haight is a serious chemist who has spent a lifetime perfecting methods of teaching that are effective and interesting. Until his official retirement in 1987, he was active both in research, carrying out studies on reaction mechanisms in aqueous solutions which resulted in about 100 papers, and organizing instruction for more than 3000 students per semester as director of the general chemistry program. Haight developed a series of videotapes and other multimedia teaching aides and kept up to 125 teaching assistants per semester very busy. In his new retirement home on Bainbridge Island in Washington, he sends regards to his former assistants, students, and colleagues and hopes that they will come visit, and, with luck, admire Mr. Rainier at a distance.

His success as an educator/lecturer/performer won considerable recognition from the chemistry education community. In 1976 he won the Catalyst Award of the Manufacturing Chemists Association and in 1979, the ACS Award in Chemical Education. He was program chairman of the Division of Chemical Education of the ACS in 1969 and was elected Chairman of the Division of Chemical Education of the ACS in 1976. He was author and coauthor of four textbooks which are widely used in general chemistry and another text in the area of Generni Physical Science.

Haight completed his undergraduate work at Stanford University and received his Ph.D. from Princeton University in 1947 for research performed on the Manhattan Project. He was a Rhodes Scholar in 1947/48 and taught at a number of schools, including 10 years at Swarthmore College, before coming to the U. of I. in 1966. He developed a lifelong interest in teaching because of the opportunities it offered to introduce young people to an exciting science and to stimulate them to further study.

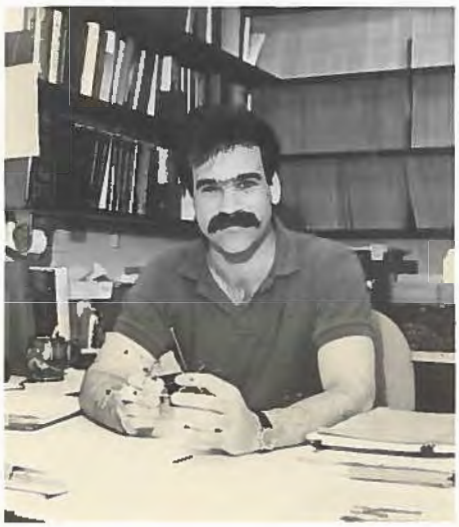
How to Give a Gift

There are three main channels for making a financial donation to the School of Chemical Sciences or any department within it. You can send us a check directly, specifying, if you wish, what you would like to support. You can send a check to the U. of I. Foundation, with the designation of the unit that is to receive your funds. You can also support the LAS drives and specify that your contribution is designated for the School of Chemical Sciences or any unit within it.

If you have questions about donations, please call the editor of the Newsletter, Ellen Handler, at 217-333-6083, or call the U. of I. Foundation at 217-333-0810. We will assist you in any way we can.

We also appreciate gifts other than checks. Donations of real estate, appreciated securities and other financial instruments are very welcome. One delightful gift came in the form of a photograph album of a U. of I. chemistry student, class of '23, donated by Dr. Len Weinstock of Merck Sharp & Dohme. (See back of the newsletter for one of his lovely photos.)

The Invention of New Organic Reactions



Since 1980 Professor Scott Denmark of the Chemistry Department has been winning acclaim for his research in and development of novel synthetic reactions as new methods for stereocontrolled carbon-carbon bond construction.

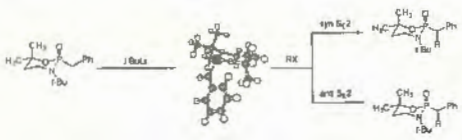
Denmark has been able to elucidate the underlying factors which control the course of chemical reactions. By combining his skills as a synthetic chemist with mechanistic insights, he has investigated carefully designed models, which allow the elucidation of intrinsic reactivity-controlling factors. The ability to understand why reactions proceed as they do, allows for the *invention* of new reactions based on these reactivity/selectivity principles.

Stereochemistry, the spatial aspect of the science, is pervasive and serves as a central theme in all of Denmark's research. The profound importance of stereochemistry is evident throughout the natural and synthetic world. As an end objective, the ability to control molecular (and macromolecular) stereochemistry, is an important and continuing goal of synthetic chemistry. As a tool to investignte reactions, it is indispensable. Denmark's research embodies both of these aspects of stereocontrol with the ultimate objective of designing small molecular catalysts to effect many useful carbon-carbon bond forming reactions.

Denmark's approach to synthesis methodology is reactivity rather than structure oriented. His work on the carbanionic-Claisen rearrangement is exemplary of the amalgamation of synthetic and mechanistic objectives which characterize his research. Denmark pioneered the use of a carbanion to accelerate a [3,3]-sigmatropic rearrangement. Using arylsulfonyl-stabilized anions, he has studied kinetics, substituent effects, internal stereocontrol, and synthetic utility of the products.

More recent work has focused on the use of phosphorus-anion-stabilizing groups. These studies have spawned a major new research direction in the use of chiral-auxiliary-based, carbon-carbon bond formation via phosphorus stabilized anions.

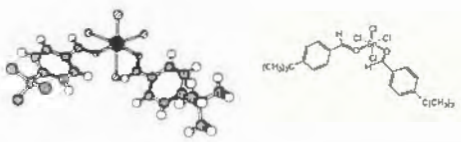
Denmark has taken a broadly based approach to elucidating anion structure using multinuclear NMR, *ab initio* computational methods and stereochemical studies. These insights have allowed the rational design of a chiral auxiliary for phosphorus, which provides extraordinary selectivities in electrophilic substitutions, e.g. in the synthesis of biologically important aminophosphonic acids.



Although a major focus of his research has been on pericyclic processes, his most notable accomplishments are his stereochemical and mechanistic studies of the reactions of allylmetals (silanes and stannanes) with aldehydes. He has approached this complex problem with the use of carefully designed models and extensive multinuclear VT NMR investigations of the reacting species.

By stereochemical analysis of the models, he has developed the first unambiguous insights into the relative disposition of the reacting double bonds. These models have allowed the first demonstration of the stereochemical significance of the Lewis acid-aldehyde complex. To study the function of the Lewis acid, Denmark examined the complexation of aldehydes in solution and defined the stoichiometry and structure of the complexes.

Recently, he reported the first X-ray crystal structure of an SnCl4-aldehyde complex. The consequences of this structure and its behavior in solution will have a profound effect on the way in which organic chemists think about the reactions of complexed carbonyls.



One of his colleagues described Denmark as "an outstanding young scientist whose research in synthetic organic chemistry has attracted both national and international recognition." The impact of his work can be seen in the emulation of the concepts embodied in his methodological studies. His work has demonstrated that the invention of new organic reactions is a viable forum for the study of structure and reactivity, which is central to organic chemistry.

As word of his work has spread throughout the chemical community, he has become a sought-after speaker and has presented over 100 invited seminars here and abroad. More formal recognition has followed both locally and nationally. He has been an Eli Lilly Research Grantee, and an A.O. Beckman Junior Fellow in the Center for Advanced Study at the University of Illinois.

He received an Alfred P. Sloan Fellowship in 1985, an NSF Presidential Young Investigator Award that same year, and the Stuart Pharmaceuticals Award in Chemistry in 1987. In 1986, he was appointed a University of Illinois Scholar, one of the highest awards granted by the University, and in 1988 he received major national recognition in the form of an Arthur C. Cope Scholar Award from the American Chemical Society.

Professor Denmark's career has been outstanding in the quality of his work, in the renown he has received, and in the speed that all this has happened. He has been at Illinois only since 1980. He completed his undergraduate work at the Massuchusetts Institute of Technology in 1975 and his graduate degree (D.Sc.Tech.) from the Swiss Federal Institute of Technology (ETH) in 1980. An outstanding scientist like Professor Scott Denmark puts the University of Illinois among the top half dozen schools in the nation, in the quality and quantity of its faculty and graduates, year after year after year.

Conrad Named LAS Jubilee Professor

H.E. Conrad, a member of the Biochemistry faculty since 1958, has been named to one of only three LAS Jubilee Professorships, established by the College of Liberal Arts and Sciences in honor of its 75th Anniversary. Selection is based on outstanding contributions to both undergraduate instruction and scholarship. The Professorship carries a salary award plus research support for three years but the title will continue in perpetuity.

Professor Conrad was selected for an outstanding teaching award by the School of Chemical Sciences in both 1980 and 1987. According to one of his colleagues, he is an outstanding teacher because "he has *cared* so much about doing it well....His standards are high. His students are challenged to the limits of, but not beyond their capabilities. Students have frequently volunteered expressions of their respect and appreciation (for his teaching)."

His research focuses on two general areas. He has studied the path of heparan sulfate biosynthesis in liver cells and found that a portion of the polymer changes the growth behavior of the cells. His results raise the exciting possibility that a special form of heparan sulfate may regulate "contact inhibition", an important property that differentiates normal from cancerous cells.

The second major area of Conrad's research is the role of chondroitin sulfate and collagen in bone formation during embryogenesis. He is examining factors in chondroitin sulfate structure that are involved in calcification and conducts studies on how chondroitin sulfate and collagen synthesis are regulated during bone calcification.

Because of the outstanding quality of his research, Professor Conrad has received a MERIT Award by the National Institutes of Health which specifies that research funding will be continued without review for the next seven years, a level of confidence in his scholarship afforded to very few researchers.

Vagelos to Give Beckman Lecture

Dr. Roy Vagelos, the CEO of Merck and Company, has been chosen to give the all-university Beckman lecture in the Fall of 1989. He will be the guest of the Biochemistry Department, which nominated him to the University Research Board for this honor.

The annual Arnold O. Beckman Lecture on Research and Innovation was established by the Campus Research Board in 1982 to emphasize the benefits of basic research as reflected in the development of new technology and the general economic benefit to society. Lecturers are chosen because they have demonstrated a capacity not only for basic discovery, but also for management of the factors that are necessary to ensure the development of commercially successful products.

Dr. Vagelos became Director of Biochemistry Research at Merck in 1975 and rose to CEO ten years later. During his tenure with Merck, the company has produced more new products than it had in the previous 25 years. His major success has been the development of an inhibitor of cholesterol synthesis, a compound which goes by the trade name of Mevacor.

Trained as a physician at Columbia University Medical School, Dr. Vagelos began his research at the National Institutes of Health. He made major discoveries concerning the biosynthesis of fatty acids in prokaryotic cells for which he was later elected to the National Academy of Sciences. From 1966 until he moved to Merck in 1975, Dr. Vagelos was Chairman of the Biological Chemistry Department at the Washington University Medical School. According to Dr. Ross, Dean of the Johns Hopkins University Medical School and a member of Merck's board of directors, "He's one of the most remarkable men I've known. He talks my language—science and medicine, but also talks the language of business."

New Undergraduate Scholarships

The School of Chemical Sciences is very fortunate to have received another set of scholarships for undergraduate study from the International Paper Company. Scholarships for undergraduates are extremely important as recognition for outstanding work and to retain promising minority students during their undergraduate careers. Undergraduate scholarships are funded by industrial grants, alumni, and friends of the School.

The International Paper Company Foundation has provided four generous scholarships of $2000 each to chemistry and biochemistry and chemical engineering students. These "Chairman's Scholarships", as they are called, are not oaly a source of pride to their recipients but also a very welcome infusion of cash to students with unmet financial needs. For students early in their undergraduate careers, these scholarships are potentially renewable until they graduate.

The Eastman Kodak Company provides 20 undergraduate scholarships yearly to the U. of I. to students in various fields of study. These scholarships are given to freshmen and can be renewed for as long as three years. Generally, 2-3 of the winners are chemical science students.

The Chemical Engineering Department receives gifts for 7 scholarships for outstanding undergraduates from Allied-Signal Foundation, Marathon Oil Company, Amoco Foundation and Arco Oil and Gas Company. The selected students, most of whom are at the beginning of their senior year, receive $1,000 each. In addition, both Amoco and Procter and Gamble provide even larger scholarships for minority students. These may be given as early as their freshmen year to ease financial pressures for selected students.

Undergraduate scholarships are highly valued by the School of Chemical Sciences because they provide "added value" to the excellent undergraduate program offered by the University of Illinois. Supporters of alumni funds that provide financial support for undergraduate scholarships as well as our friends in industry who underwrite these programs are to be commended for their far sighted view of the needs of chemical science education, of which the undergraduate program is a major component.

Faculty Honors

Harry G. Drickamer, Professor of Chemical Engineering, Chemistry and Physics, received the Elliott Cresson Medal of the Franklin Institute of Philadelphia.

Paul C. Lauterbur, Professor of Chemistry and of Medical Information Science, received the Heineken Prize for Medicine from the Royal Netherlands Academy of Arts and Sciences. The prize was made available by the Amsterdam Foundation for Medical Science. Professor Lauterbur was its first recipient.

Among Professor Lauterbur's other honors was to be named to the Hall of Fame for Engineering, Science, and Technology. He received a D.Sc. from Wesleyan University. He also received the "Gold Medal Award" of the Society of Computed Body Tomography. In addition, the Society of Computed Body Tomography has established a Lauterbur Award for research in magnetic resonance imaging.

Scott E. Denmark, Professor of Chemistry, has received a 1989 Arthur C. Cope Scholar Award from the American Chemical Society. The award recognizes outstanding scholars at all stages in their careers with a plaque and an unrestricted research grant.

Peter Guy Wolynes, Professor of Chemistry and Physics, received an Honorary Doctor of Science degree from Indiana University in honor of the dedication of a new addition to the Chemistry Building. He also received the 1988 Fresenius Award of Phi Lambda Upsilon, the National Chemistry Honor Society. The American Physical Society elected him to the status of a Fellow.

Kenneth L. Rinehart, Professor of Chemistry, received a medal from the Kitasato Institute of Tokyo, for his "Research in New Bioactive Compounds" on the occasion of the 25th anniversary of the Institute.

In addition, Professor Rinehart has been selected the 1989 recipient of the Research Achievement Award of the American Society of Pharmacognosy in recognition of his work in the natural products area.

Gregory Girolami, Professor of Chemistry has been named to receive a Teacher-Scholar Award by the Camille and Henry Dreyfus Foundation.

Richard C. Alkire, Professor of Chemical Engineering and Head of Department, has been elected to the Board of Directors of the American Institute of Chemical Engineers.

Andrezej Wieckowski, Professor of Chemistry, has received an "Honorable Lectureship" award from the National Science Council of Taiwan. He has been invited to present a series of scientific lectures at various Taiwanese research institutions.

John A. Katzenellenbogen, Professor of Chemistry, has been named a Fellow of the American Association for the Advancement of Science.

Charles A. Eckert, Professor of Chemical Engineering, has received the 1989 Halliburton Engineering Education Leadership Award. Professor Eckert was recognized for his contribution in introducing computer-based techniques into chemical engineering courses and for his efforts to develop a new course in Chemical Engineering Communications.

H.E. Conrad, Professor of Biochemistry, received an LAS Jubilee Professorship for his outstanding achievements in teaching and research (see article).

Former Faculty

E.J. Corey Wins Japan Prize
Elias J. Corey, who was on the Illinois chemistry faculty from 1951 to 1959, has won the 1989 Japan Prize, awarded by the Science and Technology Foundation of Japan. He will receive the foundation's Medical Science award for his contributions to synthetic organic chemistry that have resulted in the syntheses of important bioorganic substances of great therapeutic value. Corey was the first to synthesize prostaglandins and also developed chemical pathways for the synthesis of more than 60 complex naturally occurring organic molecules, including erythronolide, the basic nucleus of the antibiotic erethromycin.

According to a Harvard colleague, Professor Emeritus Frank H. Westheimer, Corey is perhaps the most productive organic chemist in the world. His work has been recognized with some 30 medals and awards, including, most recently, the National Medal of Science in 1988. He has received seven honorary degrees including an honorary D.Sc. from the University of Illinois in 1985.

On the occasion of his 60th birthday, a symposium in his honor was held at Harvard University.

Chandler Wins Hildebrand Award
David Chandler, who was a professor of chemistry at the University of Illinois from 1970-1983, won the 1989 Joel Henry Hildebrand Award in the Theoretical and Experimental Chemistry of Liquids from the ACS. Since 1986, Professor Chandler has been professor of chemistry at the University of California at Berkeley. Professor Chandler has won numerous awards and has been selected to give the 1989 Willis H. Flygare Memorial Lecture at the University of Illinois.

Shaghashiri Awarded Honorary Doctorates
Bassam Z. Shakhashiri, a postdoctoral fellow and subsequent member of the Chemistry faculty from 1968 to 1970, has received two honorary degrees. He received the degree of Doctor of Humane Letters, honoris causa, from Illinois State University and the Doctor of Public Service, honoris causa, from the George Washington University. Dr. Shakhashiri, who is director of the Directorate of Science and Engineering Education at the National Science Foundation, was honored for his role in fostering excellence in science, engineering, and mathematics education in the United States.

Yaukwich on Board of Directors of ACS
Peter E. Yankwich, who was a member of the Illinois chemistry faculty from 1948 until his retirement in 1988, has been re-elected to a third three-year term on the Board of Directors of the American Chemical Society. Since 1985, Dr. Yankwich has been an executive officer of the National Science Foundation Directorate for Science and Engineering Education.

Haight Appointed at Australian National University
Gil Haight, who was Professor of Chemistry at Illinois from 1966, until his retirement in 1988, has again been appointed a Visiting Fellow at the Research School of Chemistry of the Australian National University. His appointment runs from January to March, 1989.

Alumni News

In Memoriam

Word has reached us that **Horace H. Bliss,** Ph.D. '31 (Chemistry with G.F. Smith) has recently passed away. Dr. Bliss spent most of his career teaching at the University of Oklahoma. He was a strong advocate of undergraduate education and of building strong relationships between students and faculty and supported these interests with his personal resources.

Mrs. Borroff informed us that her husband, **James D. Borroff,** B.S. '36, died on February 27, 1988. Most of his career had been devoted to rubber, plastics and shoe products.

Frederich William Cagle, Jr., Ph.D. '46 (Chemistry with Clark), died on May 1, 1988. He had retired as Professor and Head of the Chemistry Department at the University of Utah but still worked with 4 graduate students at the time of his death.

Glenn Finger, Ph.D. '38 (Chemistry with Adams) died on September 15, 1988. Dr. Finger had worked for 40 years at the Illinois State Geological Survey.

Word has reached us of the death of **Robert M. Hill,** Ph.D. '24 (Biochemistry with Lewis). Until his retirement in 1963, he was Professor at the University of Colorado School of Medicine. For several years after his retirement, he was associated with the Mercy Institute for Biomedical Research in Denver.

Devon W. Meek, Ph.D. '62 (Chemistry with Drago), died on December 7, 1988. He was Professor Emeritus and past Chairperson of the Ohio State University Department of Chemistry. In 1981-82 Professor Meek was a Gugenheim Fellow. In honor of his retirement, plans were announced to establish a Devon W. Meek Industrial Lectureship to fund an annual lecture recognizing Meek's support for closer academic-industrial ties.

We have been informed that **Ralph E. Meints,** Ph.D. '32 (Chemistry with Hopkins) has passed away.

Mr. Harold W. Mohrman, B.A. '39 died on December 2, 1987.

William Henry Monsson, B.A. '23 (Chemical Engineering) died on February 14, 1989. Mr. Monsson had worked for the Hooker Electro-Chemical Company (now Occidental Chemical Company) in Niagara Falls, New York. His most recent position had been General Sales Manager for the company.

Robert L. Pigford, Ph.D. '42 (Chemistry with Johnstone) died on August 4, 1988. He had been University Research Professor of Chemical Engineering at the University of Delaware. His many contributions to chemical engineering were recognized by his election to the National Academy of Science and the National Academy of Engineering. He was a Fellow of the AIChE, and was recipient of that organization's Professional Progress Award, the William H. Walker Award, and the Warren K. Lewis Award. He was also the AIChE's Institute Lecturer and recipient of the University of Delaware's first Alison Award in recognition of his contributions to that institution.

Word has reached us of the death of Dr. **Pierce W. Selwood,** Ph.D. '31 (Chemistry with Yntema).

News of the Classes

'30s

Arthur G. Holstein, B.S. '33, retired as Chairman of the Board and President of Phanstiehl Laboratories. He is a past chairman of the carbohydrate division of the ACS and the first recipient of the Wolfrom Award.

'40s

William J. Bailey, Ph.D. '46 (Chemistry with Marvel), Professor of Chemistry at the University of Maryland, is the 1988 recipient of the Henry Hill Award, given by the ACS Division of Professional Relations. Professor Bailey was president of the ACS in 1975.

Carl W. Bontemps, B.S. '45, has been appointed Vice President of Colmen Management Company, a private investment banking firm. He is also Managing Director of Colmen International Ltd., an affiliate which manages the firm's international activities. Before joining Colmen, Mr. Bontemps worked for Rohm & Haas for 38 years.

Rod Hader, B.S. '44 in Chemical Engineering, has stepped down as ACS Secretary and Deputy Executive Director. He had held the post of ACS Secretary since the position was created in 1970 and was named Deputy Executive Director in the 80s.

William R. Krigbaum, Ph.D. '49 (Chemistry with Wall), won the 1988 ACS Award in Polymer Chemistry. He is the James B. Duke Professor of Chemistry at Duke University and has made continued and distinguished contributions to understanding the physical chemistry of polymers.

James H. Saunders, Ph.D. '46 (Chemistry with Marvel), became Affiliate Professor in the Department of Engineering and Policy at Washington University, St. Louis, after retiring in 1985 as General Manager of Research and Development with the Monsanto Fiber and Intermediates Company.

Odette L. Shotwell, Ph.D. '48 (Chemistry with Frank) was named 1989 Presideat of the Association of Official Analytical Chemists.

'50s

Jack H. Bergman, B.S. Ch.E. '50, has retired after 35 years with the Du Pont Company. He informed us that retirement has not reduced his schedule.

Christie G. Enke, Ph.D. '59 (Chemistry with Laitinen) won the 1988 ACS Award for Computers ia Chemistry. He is a Professor of Chemistry at Michigan State University. In 1974 he received the ACS Award in Chemical Instrumentation.

Joseph J. Lagowsky, B.S. '52, has won the 1988 ACS Award in Chemical Education. He received his Ph.D. from the University of Michigan in 1957 and joined the University of Texas at Austin in 1959. He has been Professor of Chemistry since 1967 and was appointed Professor of Education in 1973. He is editor of the Journal of Chemical Education and served as general chairman of the fifth Biennial Conference on Chemical Education.

John T. Marvel, A.B. 1959, was appointed Vice President of Research and Development at Ethyl Corporation. Previously, he had spent 19 years with Monsanto Corporation, most recently as General Manager of Science and Technology for Europe and Africa.

George W. Parshall, Ph.D. '54 (Chemistry with Fuson) won the 1988 ACS Earl B. Barnes Award for Leadership in Chemical Research Management. Dr. Parshall is Director of Chemical Research at the Du Pont Company.

Melbert Peterson, M.S. '55, has been appointed Director of the John Deere Planetarium at Augustana College. He received his doctorate from Oklahoma State University.

William D. Smart, M.S. '53, retired from Abbott Laboratories in 1987 as Corporate Vice President. He was with the company over 32 years and served most recently as President of Abbott's Ross Laboratories Division.

Ruth Ann Verell, M.S. 1958, has been appointed Deputy Director of the Division of University and Industry Programs in the Office of Energy Research, U.S. Department of Energy. Prior to her current appointment, she had spent six years with the Department of the Air Force, working on executive enhancement activities.

'60s

Eugene J. Boros, B.S. '62, was appointed Vice President-General Manager of Specialty Products in the Specialty Chemicals Division of Union Carbide. He continues to be responsible for the corporation's electronic processing materials businesses, which include Novatran Corporation, London Chemical Company, Integrated Technologies, Inc., and KTI Chemicals, Inc., all wholely owned subsidiaries of Union Carbide.

Michael T. Bowers, Ph.D. '66 (Chemistry with Flygare) is preceptor for the ACS Nobel Laureate Signature Award for Graduate Education in Chemistry. He is currently Professor of Chemistry at the University of California at Santa Barbara.

Frederick S. Brown, Ph.D. (Chemistry with Hager) was promoted to Vice President and Director of Group Development for the TRW Space and Technology Group. Most recently, he was product line manager for the group's Federal Systems Division.

Allan R. Champion, Ph.D. '67 (Chemical Engineering with Drickamer) recently celebrated his 15th year with the Fibers Department of the Du Pont Company.

Michael Crosser, B.S '68, has been promoted to senior coasultant at Donohue and Associates, a design firm in Sheboygan, Wisconsin. Prior to his promotion he had been head of the environmental sciences department.

Thomas Z. Fahidy, Ph.D. '65 (Chemical Engineering with Perlmutter), was appointed to a second term as associate editor of the Canadian Journal of Chemical Engineering. He is a Professor of Chemical Engineering at the University of Waterloo in Ontario, Canada.

Roger A. Golec, B.S. '64, a senior staff safety engineer in the Environmental Affairs and Safety Department of Amoco Corporation, was awarded the American Petroleum Institute's Citation for Service in 1988.

Willard W. Harrison, Ph.D. '64 (Chemistry with Malmstadt) has been named Dean of the College of Liberal Arts and Sciences at the University of Florida in Gainesville.

Donald W. Huntley, B.S. '63, received his J.D. from the U. of I. in '66 and is currently counsel in the legal department of the Du Pont Company.

Marwin K. Kemp, Ph.D. '68 (Chemistry with Flygare) was presented the "Oklahoma Chemist Award" by the five Oklahoma Sections of the American Chemical Society. The award was given, in part, to recognize Dr. Kemp's development of a hands-on science enrichment program for fourth and fifth grade students.

Ronald L. Reierson, B.S. '66, was promoted to manager of Long Range Research for Alcolac in Baltimore, Maryland.

Howard T. Silverstein, Ph.D. '69 (Chemistry with Todd). Professor of Chemistry at Palmer College of Chiropractic Medicine, has been appointed registrar of the college.

Leslie J. Story, B.S. '61, was named Group Vice President in the Chemicals Division of the BASF Corporation. Most recently, he was General Manager of BASF Corporation's Geismar, Louisiana manufacturing complex.

John G. Verkade, Ph.D. '60 (Chemistry with Moeller), was elected to the Board of the American Chemical Society. He is Professor of Chemistry at Iowa State University.

Virgil W. Weiss, Ph.D. '66 (Chemistry with Flygare), has been appointed Vice President of Research and Development of the Vista Chemical Company. He was formerly President of Lever Research Incorporated.

'70s

Ronald L. Amey, Ph.D. '79 (Chemistry with Martin) is a Senior Research Chemist with the Petrochemicals Department at the Du Pont Company. He is responsible for new business development and applications support for paper chemicals, corrosion inhibitors, and bio-active nitrogen heterocycles.

Steve Bym, Ph.D. '71 (Chemistry with Curtin and Paul) heads two research groups at Purdue University, where he is Professor of Pharmacy. One is the National Cooperative Drug Discovery Group and the other is a National Center for AIDS Research.

Judy S. Chen, Ph.D. '71 (Chemistry with Coates), was named employee of the month in April, 1988. She is a lead engineer at Boeing Commercial Airplanes.

Timothy R. Felthouse, Ph.D. '78 (Chemistry with Hendrickson), has been appointed an Associate Fellow in Monsanto Company's program to recognize outstanding contributions. Dr. Felthouse is a Senior Research Specialist in the Sulfuric Acid Catalyst Group of Monsanto Enviro-Chem Systems.

William H. Morrison, Jr. Ph.D. '74 (Chemistry with Hendrickson) is a Senior Research Associate at the Du Pont Company, working on electronic materials.

Gary W. Nickel, Ph.D. '78 (Chemistry with Applequist), has been appointed staff chemist with the European Finishes Subsidiary of the Du Pont Company in Belgium.

Edward G. Saurborn, Ph.D. '73 (Chemistry with Applequist) is a Senior Research Associate with the Du Pont Company in their Imaging Systems Department Research and Development Laboratory.

Valeria Schiemann, Ph.D. '78 (Chemistry with Jonas) was promoted to Department Head, Assembly Technology, at AT&T Bell Labs Engineering Research Center, in Princeton, NJ.

Barbara J. Slatt, Ph.D. '75 (Chemistry with Natusch) has been promoted to Director of Product Development for the Gastrointestinal Category of the Health and Personal Care Division of the Procter and Gamble Company.

Mark A. Stanish, B.S. Ch.E. '76, received an award for the *Best Paper in Drying* from the Sixth International Drying Symposium, in Versailles, France, September, 1988.

Bill F. Sullivan, M.S. '72, was promoted to Lt. Colonel in the USAF on March 1, 1989. He is currently active in low observables technology.

'80s

Peter Bellus, Ph.D. '80 (Chemistry with Brown), recently joined Westinghouse Electronic Systems Group as an advisory engineer, working on materials for microwave applications.

Thomas S. Diemer, B.S. '84, received his M.D. degree from the University of Illinois College of Medicine in Peoria in June '88.

Todd S. Giese, B.S. '80 (Biochemistry), who received his M.D. degree from the U. of I. Medical School in Chicago, will become a member of the medical staff of the Northern Illinois Medical Center in McHenry, Illinois.

Dru D. Hauter, B.S. '84, received his M.D. degree from the Southern Illinois University School of Medicine in May, '88.

Kenneth E. Jaconetty, B.S. Ch.E. '82, received a J.D. degree from George Washington University in May, 1988 and is now employed by Sandoz Ltd. at their world headquarters in Basel, Switzerland.

Warren Kammerer, B.S. Ch.E. '81, graduated from the U. of I. College of Medicine in 1987 and completed a psychiatry residency at Lutheran General Hospital in Park Ridge, Illinois.

David Kristo, B.S. '84 (Biochemistry) received his M.D. degree from Southern Illinois University School of Medicine in May, '88.

Ted Lightfoot, Ph.D. '85 (Chemical Engineering with Drickamer) has recently been selected as the first Industrial Fellow at the University of Minaesota Center for Interfacial Engineering. His permanent position is Staff Research Engineer at the Du Pont Company.

Michael E. Mackay, Ph.D. '85 (Chemical *Engineering with* McHugh) has recently become a Lecturer in the Department of Chemical Engineering at the University of Queensland in Australia.

Robert McMahon, B.S. '80, has accepted a position as Assistant Professor of Chemistry in the College of Letters and Sciences at the University of Wisconsin at Madison.

Justin Neway, Ph.D. '83 (Biochemistry with Switzer), has been appointed Director of the Fermentation Research and Development Department at the Cetus Corporation in Emeryville, California.

Sean O'Brien, B.S. '84, received his Ph.D. in Chemistry from Rice University and is presently a visiting scientist at the Institute of Molecular Science in Okazaki, Japan.

Liz (Gale) Potts, B.S. Ch.E. '80, has accepted a position as quality assurance manager at the American Gas Association Laboratories in Independence, Ohio.

Douglas J. Purdy, B.S. '84, received his M.D. degree from Southern Illinois University School of Medicine in May, '88.

Diane L. Reineman, B.S. '84, will be receiving her M.D. degree from the University of Illinois College of Medicine at Peoria in June '89.

Kurt Rothenberger, Ph.D. '88 (Chemistry with Belford) is taking a postdoctoral position in the Fossil Energy Postgraduate Training Program, administered by Oak Ridge Associated Universities. He is located at the Pittsburgh Energy Technology Center, a site of the U.S. Department of Energy that specializes in coal.

Martha Schlicher, Ph.D. '88 (Chemistry with Coates), is a Research Chemist with the Monsanto Corporation in Chesterfield, Missouri.

Steven Tassler, B.S. '84, received his M.D. degree from Rush Medical College of Rush University, Rush-Presbyterian-St. Luke's Medical Center.

Elizavet P. Vrahopoulou, Ph.D. '86 (Chemical Engineering with McHugh) received the 1988 C.E.K. Mees Award, Eastman Kodak's highest honor for research. It is presented for original, technical or scientific achievement reported in the form of a technical report. Dr. Vrahopoulou is a Senior Research Scientist at the Coating Technologies Division of the Manufacturing Research and Engineering Organization at Kodak. She received the award for her fundamental study of streak imperfections in photographic coatings and was the newest member of the Kodak research community ever to win it.

KEEP IN TOUCH

Return to: Ellen Handler, Editor
SCS Alumni Newsletter
103 Noyes Laboratory
505 S. Mathews
Urbana, IL 61801

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Your news (please include newspaper clippings, photos, extra sheets, etc.)

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The PH.D. Graduates of 1923

The photo shows the 13 new chemistry doctorotes of 1923. In that year, the University of Illinois gave 10% of all chemistry doctorates conferred in the United States. Two of the 13 were women. One became a faculty member at the University of Illinois. Can you identify the class members?

SCS Alumni Newsletter
School of Chemical Sciences
University of Illinois at Urbana-Champaign
106 Noyes Laboratory
505 South Mathews Ave.
Urbana, Illinois 61801

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