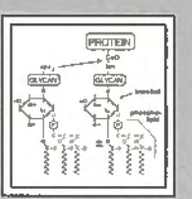
School of Chemical Sciences ALUMNI NEWS

#83 Fall 1994

University of Illinois at Urbana-Champaign

INSIDE



David Milligan Leads Pharmaceutical Research at Abbott

When he left the University of Illinois in '67 with a Ph.D. in Organic Chemistry, David Milligan listed his career objectives as "general management and marketing." Today, as Abbott's Corporate Vice President for Pharmaceutical Products Research and Development, he has clearly fulfilled these objectives. As Dave recounts his steps up the ladder, he emphasizes the fun his career has provided and clearly relishes the many challenges that he has met and expects to meet in future assignments.

His responsibilities range over the entire R&D spectrum in support of a growing pharmaceutical business, from the discovery of new chemical entities and the basic chemistry and biology that enable the generation of clinical candidates, through the clinical development program, filing product license applications, and support of marketing efforts.

David Milligan

Manager as Coach

Milligan sees his role as "coach" for each of the project teams.

About 30-35 "discovery" teams focus on the generation of new drug candidates. Teams vary by the skills needed for a given project. Many of the teams include a number of biologists and synthetic/organic chemists. In the development arena, "venture" teams carry out the necessary clinical studies for drug candidates and support the pre and post marketing operational activities.

The matrix system of management sets up interdisciplinary groups that focus on specific projects. Team members become entrepreneurs because each project takes on the characteristics of a small business. Each team enters the race to satisfy unmet medical needs at a cost savings to the health care system. "In today's environment, time is the biggest enemy," according to Milligan. "To succeed, a drug has to be first. 'Me too' products may be low risk because the basic parameters are known but they will not be winners."

The drug business is extremely competitive and becoming more so. There are good prizes for those who win but the risk/reward ratio is higher than it has ever been historically. A company like Abbott has to have a large portfolio of new pharmaceutical products with a range of risks. The major investment that Abbott made in drug discovery efforts in the 80s (including the hiring of a number of "Illini superchemists") is beginning to pay off. The company has recently filed a novel anti-inflammatory drug targeted at asthma with the FDA, and is conducting clinical studies for an anti AIDS drug (a protease inhibitor) as well as an antiulcer

These are examples of research successes. For every success there are many failures. A successful manager creates an environment where failure is not penalized. Teams are encouraged to take risks and given rewards for "trying well." A team may try and realize that the present project will not work. That failure may itself lead to new ideas and projects that were spawned by the original team. By setting milestones with deadlines for reaching different stages in drug development, a manager who listens well will "hear" from the team whether the project will "make it" and apportion resources accordingly.

Fostering Creativity Through Diversity

One of the challenges in the management of science is to integrate people with a wide diversity of backgrounds and personality profiles and to work out a culture that can accommodate that diversity. Some of the very best people might be considered disruptive in the normal flow of business and yet may have a great deal to contribute.

To be successful, according to Milligan, a manager must get the very best people, let them know what your objectives are, nurture and support them, and then get out of their way and let them do their jobs. The amazing thing, he says, is that the impossible often happens. Management says, "We can't do it" and the team says, "Just watch us."

Roots of his Management Philosophy

Milligan's management philosophy developed gradually, beginning at 3M where he started his career in the photo products division. Within four years of graduation, he had held positions as senior chemist, project leader, lab supervisor and lab manager and helped establish an x-ray film business by leading the film technology research and customer field support groups.

When the company ran into problems in scaling up production to meet demand, Milligan transferred to the company's plant in Rochester, New York, to help restructure the production operation. He found that a crucial problem was the separation of production and quality control, and the timing of quality control testing. Traditional quality control methodology relied on testing after production was finished. If the product was faulty, plant management would decide either to defer marketing until a better batch was ready, or to go to market with an inferior product - both unattractive options.

When Milligan assumed responsibility for quality control he made two major changes. He helped introduce statistical quality control, using predictive, live-time testing, and placed quality control responsibility in the hands of production.

With predictive testing, quality control parameters are established as part of product development. Production managers can see at each step in the manufacturing process whether the product has stayed within specified parameters and, therefore, has a high probability of meeting quality standards when completed. If production has strayed beyond specified limits, corrections can be instituted in real time or a faulty process aborted. Although the process seemed cumbersome and expensive to initiate, it became a long term cost saver because it prevented the production of unsatisfactory product.

After his six year experience at 3M, Milligan spent another six years developing a dental equipment and photoprocessing business for Litton Dental Products and its successor, Xonics Medical Systems. Both sharpened his business skills and prepared him for his major move into Abbott Laboratories. One of the principles he learned is that choosing the right programs and running them right is very difficult because you never have enough information. "It is important to establish a plan," he says, "but establish it loosely so that it can be changed as new inputs appear." For instance, many programs require a "break through" by a certain deadline in order to be successful. If the breakthrough appears, you shift your resources to back the winner - heavily. If not, you have to be willing to stop the project to avoid wasting scarce resources on a non-competitive effort.

On the Fast Track at Abbott

Milligan came to Abbott in 1979 as manager of a group responsible for future diagnostic products. Within six months he assumed leadership of the diagnostic products development and technical support groups. And, six months later he was running the cancer diagnostics business unit. The group developed a new test for a cancer marker, known as CEA (carcinoembryonic antigen), that was easier to use and more reproducible than the competing test then on the market.

In a remarkable feat of agility, Abbott's team launched the cancer marker within one week of receiving FDA approval. In November 1980 the group made their first sales and, by the following June, Abbott Labs had 50% of the market. Lab technicians preferred the Abbott product from the start because it was easier to use than the competitor's. And, because of its high reproducibility, the product required less re-testing and therefore lowered labor costs.

One of the important lessons learned from this experience was that customers happily paid more per unit than for a competitive product because their overall costs were lower. This product also led the way to important marketing innovations, including reagent rental plans

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Alumna Endows Fellowship for Female Chinese Students

To give others the benefits that she received, Chia-Chen Chu Kang, Ph.D. '51, is establishing an endowment to fund a fellowship for graduate study in the chemical sciences at the U. of I.

"I benefited by getting an excellent, free education from the U. of I., and now I want others from my country, especially other females, to have the same benefits I had."

Chia-Chen Chu, as she was then known, came to the U.S in 1947. She was fortunate that her father was sufficiently well-to-do that he could afford to educate a daughter as well as his sons and to pay for her trip to the U. of I. She had received her undergraduate education at the University of Shanghai where many of the chemistry faculty had studied at Western universities. One of her teachers had studied with Roger Adams.

In the 40s, higher education in China was rare, especially for females, and good students were encouraged to serve their country by studying science and technology to help China "catch up" with the West. In an era when admission to an American graduate science program was difficult for females, Chinese students had an advantage because their names were not linked to gender.

At the U. of I., Dr. Kang studied analytical chemistry with a minor in organic and was hired by M. W. Kellogg Company on Roger Adams' recommendation. Her V.P. at Kellogg was William (Butch) Handford, Ph.D. '35, a former student of Roger Adams. The company gave her the option of going into either their organic or their analytical division. She chose the latter because she was promised a promotion if she did well. Consequently, she became a supervisor two years after joining the company and was made section head in 1955. Her section offered analytical services to three groups: exploratory research, process research and pilot plant engineering. She remained with the company until 1970 when M.W. Kellogg relocated to Houston, TX and Dr. Kang started a new career.

Chia-Chen Chu Kang

Her Second Career

Dr. Kang had become interested in catalysis research and, after she left Kellogg, filed a patent application for steam reforming of hydrocarbons, a process which could be used to produce ammonia for fertilizer. Her work has attracted interest both here and abroad, particularly in China where a more economical process for producing fertilizer is a high priority.

Dr. Kang also carried out research in coal liquifaction with two small research companies. She received a grant from the Department of Energy but found that funding disappeared when the price of oil dropped and coal liquifaction became uncompetitive. So, she and her husband concentrated on growing their "nest egg." Their investments have done reasonably well and consequently she is able to set up the fellowship in the School of Chemical Sciences.

Dr. Kang has promised to come back to the U. of I. to meet the first recipient of the Chu fellowship, as it will be called. Our School is very grateful to Dr. Kang for having established the endowment and will select the best for the honor of becoming a Chu fellow. With the standard of excellence that Dr. Kang has set in her life, Chu fellows will have not only the benefit of generous financial support but also an outstanding example to follow.

Bailar Fund Gaining But Not Yet At Goal

John C. Bailar

The Bailar Fellowship Fund is still wide open and seeking contributions. In order to provide supplementary stipends for five outstanding teaching assistants annually, we need to raise an endowment of $250,000. According to Clayton Callis, chairman of the fund, our most recent tally of gifts, pledges and promises totals slightly more than $200,000.

Over 250 donors have contributed to the fund so far. More than 40 contributors have made donations/pledges of $1,000 or more and will be honored by chemistry department. Their names will be inscribed on a plaque on permanent display in the new chemical sciences building. Those wishing to be included on the plaque need to make their contributions before the end of the year when the listing will be finalized.

The first Bailar Fellows will be named in fall, 1995. We hope that the designation will receive a place of honor in the recipients' resumes and help to start the professional careers of promising young chemists.

Snyder Fund Achieves Goal

Harold Snyder

We are fortunate that Professor Harold Snyder was still with us when the Snyder Fund for undergraduate students was initiated under the able chairmanship of Dr. Robert Jones. Snyder met the early Snyder Scholars and maintained an active correspondence with them until his death last spring. Unfortunately, he did not live to see the fund make its goal.

Dr. Richard Heckert, former Snyder student, and retired CEO of DuPont, brought us to our goal as a memorial gift to Professor Snyder. From now on, we can support three Snyder Scholars annually for a semester of full time research with one of our chemistry faculty.

From the Director...

Since assuming the Directorship, there has been little time for relaxation. We have experienced an unparalleled rate of change in administrative personnel throughout the campus, from the departments within our School to the chancellors' level. As some of you may have already heard, there is a search underway for a new president since President Ikenberry is retiring next year.

One of my first major challenges was to establish new heads of our three departments within the School. I am very pleased to announce our success in recruiting Dr. John Gerlt from the Department of Chemistry and Biochemistry at the University of Maryland in College Park to head our Department of Biochemistry. John is a bioorganic chemist, with a Ph.D. from Michigan State University.

Paul Bohn, the new head of the Department of Chemistry, is no stranger to our School. He has been on our chemistry faculty since 1981, has served as head of the Analytical Chemistry Division and became Interim Director of the School after Jiri Jonas became Director of the Beckman Institute. Paul's willingness to assume leadership of the department demonstrates his continued dedication to advancing Chemical Sciences at Illinois.

With Richard Alkire assuming the position of Vice-Chancellor for Research and Dean of the Graduate College, we have undertaken a national search for a new Head of the Department of Chemical Engineering. In the meantime, we are grateful to Charles (Chip) Zukoski for assuming the position on an interim basis. Chip earned his Ph.D. from Princeton in 1984 and has been on the faculty of the Department of Chemical Engineering since 1985.

One of the most exciting aspects of these appointments is that they reflect our commitment to interdisciplinary emphases in chemical sciences.

John Gerlt, as a bioorganic chemist with a joint appointment in the organic chemistry division, augments collaboration along the interface of chemistry and biochemistry. Chip Zukoski, with a major research focus in materials chemistry and

Stephen Sligar

strong supporter of biological initiatives, serves as a major bridge between the three departments.

Our success in building interdisciplinary connections can be seen in the strong start of our program in Biomolecular Chemistry. Twenty-two students signed up for this program in its first year of operation. We are now actively working to establish a program in Materials Chemistry which should be in place for the 1995 recruiting year. A program in Cell and Molecular Engineering is on the drawing boards.

The other major focus of our current efforts within the School is to formulate a strategic plan to revitalize our infrastructure. The need for sophisticated, expensive instrumentation by a faculty that is attuned to evolving scientific research combined with increasingly constrained funding sources makes it exceedingly difficult for us to maintain our preeminent position in the field.

To meet this vital need we are formulating a strategic plan for facilities rejuvenation, drawing on the combined funding sources of the departments, School, College, University, State and Federal agencies. The key to the success of this effort will be the participation of interested alumni through helping us establish connections to funding sources and making personal contributions to maintain our national standing.

We are all justifiably proud of the accomplishments of the chemical science program at Illinois and we hope that current and future generations of alumni of our School will have reason to share our pride.

Yi Lu Will Study Metal Ions in Biological Systems

Champaign-Urbana is a long way from Beijing, China, the route that Yi Lu traveled to join our chemistry faculty. He graduated from Beijing University in 1986, received a Ph.D. from UCLA in 1992 and spent almost two years as a postdoc at Cal Tech before completing his journey to the middle west.

Yi Lu

During his graduate studies as an inorganic chemist, Lu became increasingly interested in metal ions in biological systems, a subject that has led him into interdisciplinary research. His most immediate project is to characterize the structure and functions of metal-binding sites in proteins and ribozymes (RNA enzymes).

Ultimately, he hopes to manipulate the structure and function of metalloenzymes by changing the environment around the metal-binding sites. His aim is to redesign enzymes by selecting one that is well characterized and engineering it into another that has a novel structure and function.

Because of the number of different techniques that will be necessary to conduct his studies, Lu anticipates that his research group will be highly interdisciplinary with students from chemistry, biochemistry and molecular biology. He is planning studies on three types of systems. One is the metal ions in rybozymes, an area that has not been the focus of studies by inorganic chemists but has essential roles in fighting AIDS and other retroviral diseases.

A second project is the redesign of cytochrome c peroxidase into lignin peroxidase, an enzyme that has shown great promise in providing renewable energy and in destroying pollutants such as polychlorinated biphenyls. His third project is to use azurin as a model to characterize the Cu_a site in cytochrome oxidase, an important enzyme in the respiratory chain.

Lu is excited by the interdisciplinary emphasis in the chemical sciences at Illinois which he sees as corresponding to the needs of modern biotechnology.

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FACILITIES UPDATE

by Denton R. Brown, Associate Director

Faculty, staff and students are gearing up to make way for long-awaited renovations beginning in Noyes Lab during the spring of 1995, and in Chem Annex in the summer of 1995. With the new Chemical/Life Sciences Building due to be completed in December of 1995, the level of anticipation is growing.

Since the last newsletter, our new building has really made progress thanks to an outstanding summer construction season. Structural steel was completed in August with a "topping out" ceremony (see picture). Today, the project is about 40 percent completed. The building will add 54,000 net square feet to the School's total space.

The "topping out" ceremony.

Renovations

Major renovations have begun in Noyes on two biochemistry labs, and one organic chemistry lab, instructional laboratories, and one classroom. This is an important first step aimed at the complete renovation of all of our major instructional laboratories for undergraduates. The organic laboratory will be the country's largest single laboratory to offer a fully ventilated workstation for each student.

In the Chem Annex we're presently funded for a single lab that will be a prototype for three other rooms. The design features a central instrument room, workstations that incorporate a downdraft fume hood, and a fully networked computer system for data collection and interactive communication.

The Department of Chemical Engineering is moving forward with design work to improve their undergraduate instructional laboratories with funds they are raising through their ChE 2000 campaign. The project rebuilds the unit operations laboratory and moves the process control lab and senior projects lab to renovated space within the high-bay area of Roger Adams Lab.

The state has funded a renovation of classroom 116 in Roger Adams Lab that ties in nicely with the remodeled laboratories. The combination of quality undergraduate facilities and enhanced research labs will serve the needs of future undergraduates, graduate students and faculty.

A major challenge for the School of Chemical Sciences is planning for the reuse of Noyes Lab as the faculty and their research groups move to the new building. One need is the expansion of the chemistry library. Others include lab renovations, solving issues of fire safety with proper alarms, sprinklers and exit improvements, and upgrading of graduate student space. The state has funded a series of accessibility improvements on campus in order to comply with the provisions of the Americans with Disabilities Act. We will replace the campus' oldest elevator in Noyes Lab. Thank you, Governor Edgar.

Yi Lu *continued from page 4*

Therefore, he hopes to bring a variety of biomolecular topics into his teaching of inorganic chemistry.

Lu's ambitious projects will require extensive financial support and he appreciates the generous start-up package he received that will allow him to begin recruiting students and a postdoc. He describes himself as "pleased and surprised and overwhelmed" at the reception he received at the U. of I. He has found that the School's facilities and professional staff are excellent and the professors very helpful. "I can now understand," he says, "why Illinois is considered one of the very best schools for the development of a young professor."

Winners of 1994 Teaching Awards

Front row left to right: Lauranelle Shultz, Iris Stovall, Melissa Nelsen, Paul Loida and back row left to right: Chuck Matz, Hiroyuki Kose, Teresa Stone, Steve Zimmerman, James Suggs, David Owen. Not pictured: Jonathan Higdon, Stephen Hoffman, Ararind Immaneni

Orlean Wins Recognition for Novel Method of Isolating Yeast Mutants

Peter Orlean

Because of its fundamental biochemical similarity to the human cell, the humble yeast cell offers important clues to how mammalian cells function and malfunction. One of the important similarities is the ability of the cell's protein molecules to build glycosyl phosphatidylinositol (GPI) anchors that attach certain proteins to the cell membrane. This function is clearly important because it has been conserved throughout evolution. The general process of attaching a GPI anchor is shown in Figure 1. Note the inositol molecule which was important in the Orlean group's strategy for identifying yeast mutants incapable of GPI anchoring. A study of such mutants should give us clues about what GPI anchors normally do in the cell.

The mutants discovered by the Orlean group are particularly useful for the study of GPI anchoring because they are temperature sensitive, i.e. they make the GPI anchors at 25ºC but not at 37ºC. As temperatures rise, the enzymes that are responsible for glycolipid anchoring fail to function. At 37ºC cell growth stops completely.

These mutations are detectable because the mutant cells are "haploid" and contain only one copy of each chromosome, hence only one copy of each of their genes. In other words, we can detect the mutant gene in haploids because its effects on cell growth are not obscured by the presence of a good version of the same gene.

Genetic techniques show that the GPI anchoring defect is indeed due to a mutation in a single gene. The mutation is transmitted to other yeast strains by genetic crosses, in which the GPI anchoring mutant is mated with a normal haploid yeast cell as shown in Figure 2.

Upon mating, a diploid cell is formed that contains two copies of each chromosome and the genes on them, one copy from each haploid parent. The diploid cells can be induced to undergo a process called "meiosis" in which each chromosome is duplicated, and haploid ascospores are formed that once more contain a single copy of every chromosome.

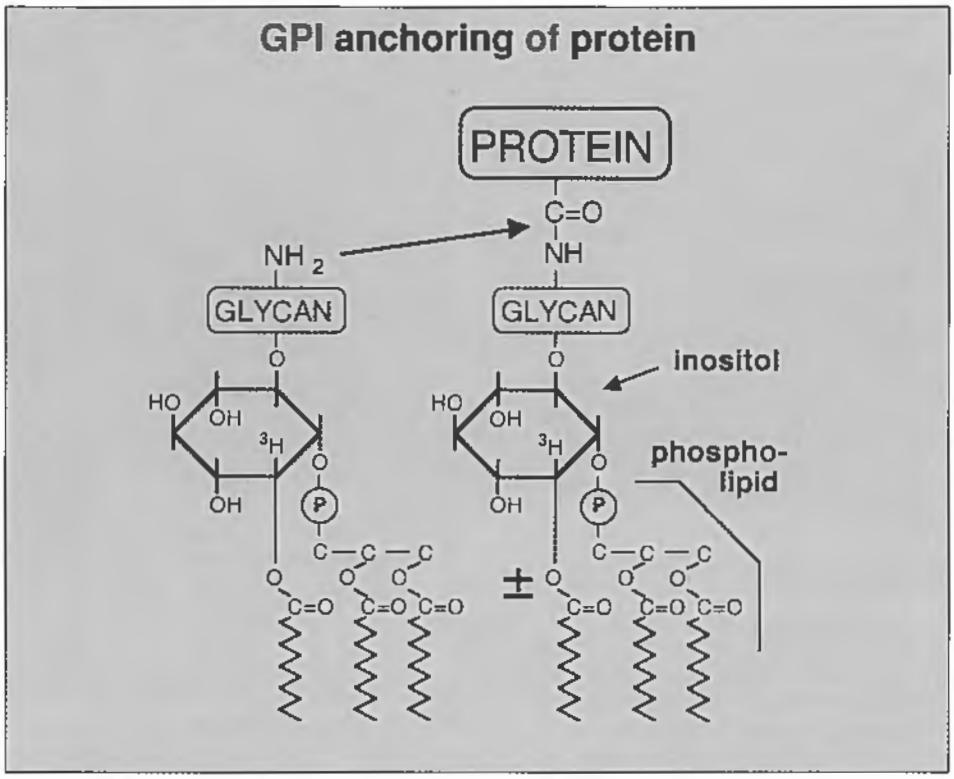

Figure 1.

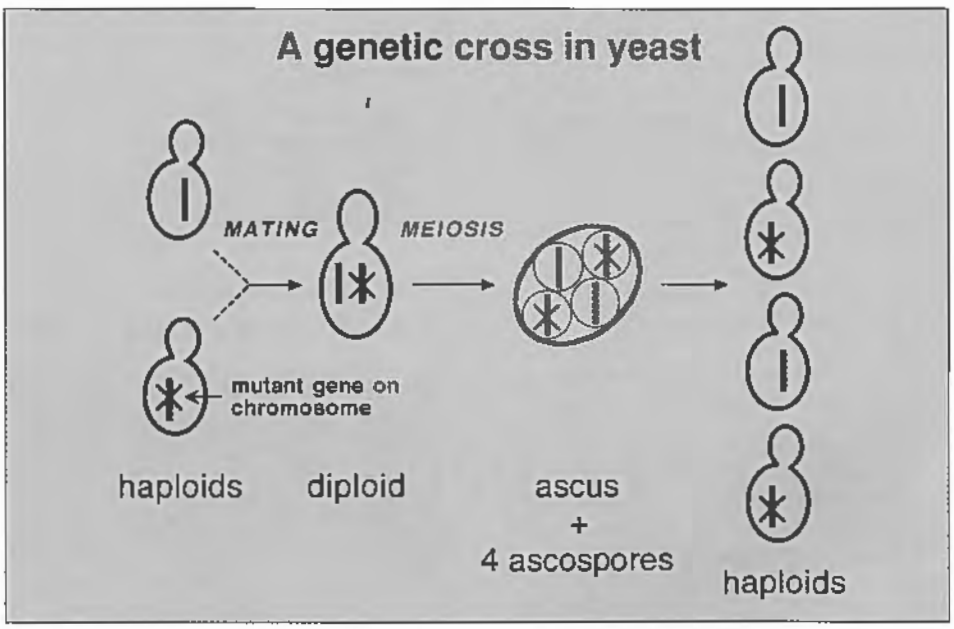

Figure 2.

The four ascospores can be separated and transferred to a petri dish, where they will grow new colonies of haploid cells. The temperature-sensitive GPI anchoring mutation will be found in two of the four haploid progeny that resulted from the formation of the diploid and its subsequent meiotic division.

The Orlean group. In back Lisa Costello, Paul Colussi, Steve Leidich and in front Irene Jensen, Peter Oleans, Daryl Meling.

Figures 3 and 4 show the difference between mutant and normal haploid cells produced in a genetic cross. At 25ºC all the haploids grow but at 37ºC half the haploids (two from each ascus) do not grow because they contain the temperature-sensitive mutation. The cells in the lower left hand corner are controls.

The effect of the mutation on GPI anchoring is shown in Figure 5. Normal yeast cells covalently attach [^{3}H]inositol (i.e. radioactively labeled) to protein as part of the GPI anchor, but mutant cells cannot. The haploid cells from the cross shown in Figure 2 had been grown at 25ºC and were then incubated with [^{3}H]inositol at 37ºC.

Where [^{3}H]inositol is attached to protein, the colonies of cells become radioactively labeled and their radioactivity can be detected as a dark "shadow" upon exposure to X-ray film, as seen in Figure 5. In such experiments we see that the haploids that cannot incorporate [^{3}H]inositol are the ones that fail to grow at 37ºC.

Orlean and his students are conducting biochemical "post-mortems" on the GPI anchoring mutants to learn how growth and development go awry in yeast cells once they stop making glycolipid anchors.

Using molecular biological techniques the Orlean group is also cloning normal versions of the mutants' defective genes by isolating the DNA fragments that can correct the GPI anchoring mutation. From the DNA sequence of the GPI anchoring genes, more can be learned about the enzymes they encode and how these proteins carry out the synthesis of glycolipid anchors.

On the basis of this work, Orlean received a prestigious award from the American Cancer Society that carries a three year research grant and faculty support.

In addition, Orlean was notified that his proposal had ranked first in the entire round of peer review. Accordingly, he was invited to attend a special meeting of the American Cancer Society where he presented his work to the assembled research professors of the society, who are among the country's most distinguished biologists.

Three students from the Orlean group involved in this project also received special recognition. Two undergraduates, Darren Drapp and Robert Latek were co-

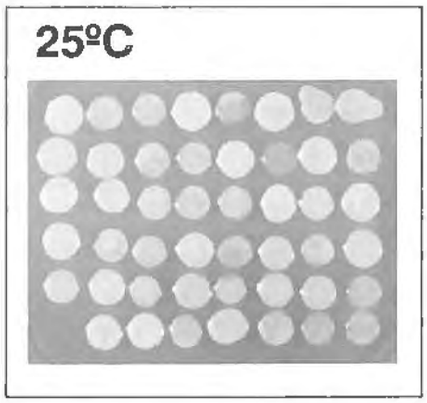

Figure 3.

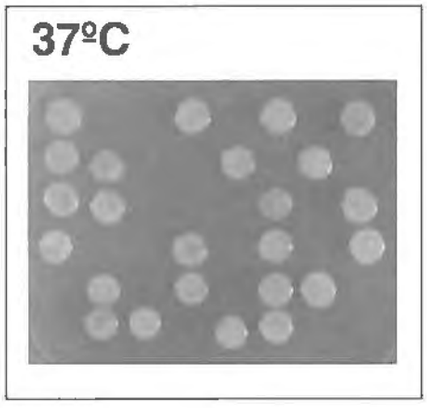

Figure 4.

recipients in 1993 and 1994 of the biochemistry department's Sidebottom Award for the best senior thesis. Steven Leidich, a graduate student, received an Avery Brundage Scholarship which is awarded to University of Illinois students "who are both gifted students and exceptional athletes."

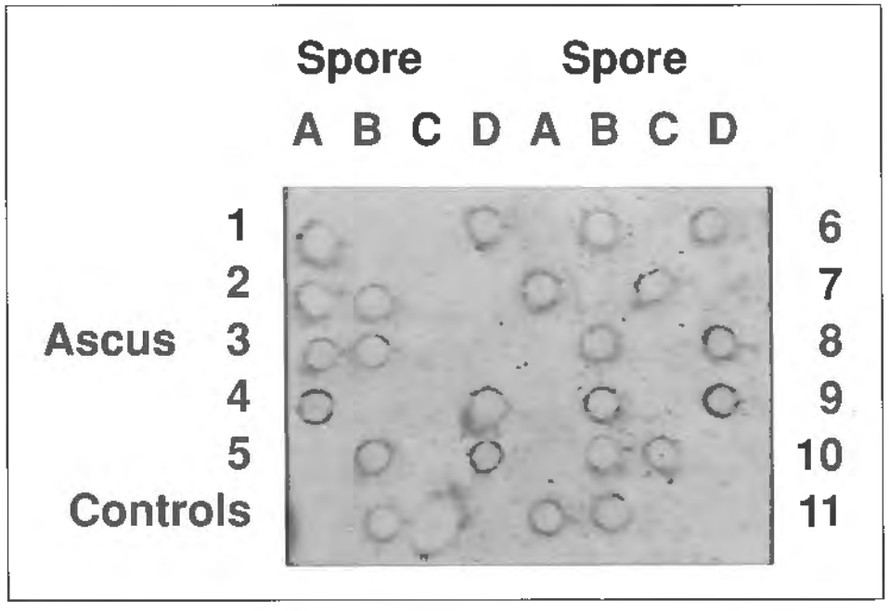

Figure 5.

Bohn Leads Chemistry

Although newly appointed as department head, Paul Bohn is not a newcomer to the U. of I. He has been a member of the chemistry faculty since 1981. He also holds an appointment at the Beckman Institute and is a member of the Materials Research Laboratory and the Biotechnology Center.

He received his undergraduate degree from Notre Dame and his Ph.D from the University of Wisconsin-Madison. He has been a Beckman Fellow at the Center for Advanced Study and a University Scholar. In 1990 he received the Coblentz Award in molecular spectroscopy.

His research interests center on the manipulation and characterization of thin films from a single monolayer to many microns thick. Prior to his current appointment, he served as Interim Director of the School of Chemical Sciences.

According to Bohn, the Department of Chemistry at the University of Illinois faces many critical challenges as it deals with the national crisis of confidence in public education, while maintaining the tradition of excellence in teaching and research, which are its heritage.

As he takes leadership of the department, Bohn is searching for ways to positively impact the lives of the people who make the Department what it is. One of his chief tasks will be to mold a new paradigm for support, which builds on the department's strengths and recognizes the political realities of the twentieth century.

Paul Bohn

In response to this challenge, the Partnership for Chemistry seeks to build on the warm relations that chemistry has always enjoyed with its alumni and friends, both private and corporate, to develop a public-private partnership for funding in the department. As the Partnership begins to take shape, the Department will target opportunities across the broad spectrum of its activities.

For example, to attract some of the world's top scholars to Urbana and give them the freedom to pursue problems at the forefront of modern molecular sciences, Bohn would like to establish a series of endowed professorships.

To provide a high caliber undergraduate educational experience here at Urbana, it will be necessary to completely refurbish the undergraduate instructional laboratories in both Noyes Laboratory and the Chemistry Annex.

Continuous funding must be sought for new instructional equipment to prepare our students for the modern workplace. In its role as a central science, the Chemistry Department must establish new research facilities, which will enable Illinois researchers of the twenty-first century to thrive, as did their predecessors.

According to Bohn, "The task is monumental but not insurmountable, with the support of our strong student body, dedicated faculty and staff, and, most of all, our large and loyal alumni group."

Standing on those three pillars, he believes, we will meet our challenges and emerge in the twenty-first century stronger than ever and ready to continue our role as a major international force in chemical education.

How do I Start?

Summer at the U. of I. brings not only flowers and heat but also an orientation program for new students and their families. We offer two options. One is a two hour campus visit with a presentation on admission policy and procedures and a tour of campus and residence halls.

You can always recognize the tour groups because the student leader gives a continuous running commentary, facing the group and leading by walking backwards. The longer Illini Days orientation program offers talks on financial aid, housing, a presentation by a faculty member, another by a student panel and a college meeting.

Gerlt Heads Biochemistry

John A. Gerlt

John A. Gerlt is a new faculty member, who comes to the U. of I. from the Department of Chemistry and Biochemistry at the University of Maryland/College Park. He earned his undergraduate degree at Michigan State University (1969) and his Ph.D. in Biochemistry and Molecular Biology from Harvard (1974), completed a postdoc at NIH with C.B. Antinsen, and taught at Yale University from 1975-1984.

Gerlt has an active research program, currently focused on the rates and mechanisms of enzyme-catalyzed reactions in which protons are abstracted from carbon atoms. Since he works at the interface of chemistry and biochemistry, he was attracted by the high quality of the faculty in both departments. He expects to assume all the functions of a faculty member in addition to his administrative responsibilities.

One of his most urgent tasks will be to hire several faculty within the next few years because the department is currently seriously understaffed. The first search will be for someone in a "biological" area who will complement the interests of the current faculty. He also hopes to recruit staff who will use the tools of modern chemistry to conduct structural studies on protein molecules. In his search for new staff members he expects to work closely with the Markey neuroscience program, located in the Beckman Institute, which is currently adding faculty.

To attract and retain faculty, Gerlt expects to place major emphasis on renovation of facilities. As he points out, it is difficult to maintain our competitive position for attracting both faculty and students when our buildings and labs "border on being ancient" though they are neither "falling apart nor unsafe." He will also seek to attract funding for endowed professorships in order to reward faculty for outstanding performance.

To meet the needs of students, he would like to reduce class size and to provide separate classes with different instructional content for undergraduate and graduate students. As a temporary measure, the department has hired outside teaching staff to maintain the current instructional program but he hopes that more permanent solutions will be possible.

To carry out his ambitious but necessary projects, he hopes to attract alumni interest and support. One of the development projects currently being organized is a drive to establish an endowed fellowship in honor of Professor Herbert Carter, which will be the first named fellowship in the department.

In addition to all else, Professor Gerlt plans to teach a seminar on subjects related to his current research. He looks forward to interacting with students, telling them what he has been thinking about and to stimulate their interest in his line of research. "How will I find the time? I'll find it. This is important."

Zukoski Interim Head of Chem E

With the appointment of Richard Alkire as Vice Chancellor of Research and Dean of the Graduate College, Professor Charles Zukoski has accepted the responsibilities as interim head of the department while a national search is under way for a permanent replacement. Since his appointment comes at a time of major developments at the national and local level, he anticipates that his tenure will be active, though of uncertain duration.

At the national level there is increased interest and opportunity in chemical engineering. Enrollments are rising and since the faculty is temporarily reduced in size, hiring is high on the agenda. Changing national priorities bring along new opportunities for research and funding. Environmental engineering, biomolecular recognition, material science, and control theory are examples of fields that are stimulating increasing interest.

At the local level the ChE2000 campaign remains a high priority item. As Zukoski said,

Charles Zukoski

"The interest and unflagging support of the alumni has made an enormous difference in the success of our program. As we move increasingly into the area of corporate support, we have to rely on our alumni more than ever to help us work with corporations to formulate areas of mutual interest to benefit our educational and research program."

One of the areas for which we will seek corporate and alumni support is for our minority recruitment and retention program. Our tutoring and counseling efforts will target both graduate and undergraduate minority students, although our emphasis will be primarily on the latter to build a pool of good applicants for graduate programs.

Professor Dane Wittrup who has coordinated the Minority Chemical Engineering Program (MChEP) is working actively with the College of Engineering to attract minority students and help them to succeed in chemical engineering at Illinois.

The renovations currently under way in Roger Adams Laboratory will also help the MChEP program because they will provide more small conference or tutoring rooms and study space. The department is entering Phase II of the renovation program. Whereas Phase I was primarily directed at safety features, Phase II will target undergraduate teaching facilities and research labs.

"My hope," says Zukoski, "is to take advantage of new opportunities nationally and on campus while maintaining the excellent tradition for which this department has justly been famous."

Petillo's Research Bridges Organic and Biochemistry

Pete Petillo began his chemistry career as a classical physical-organic chemist, studying electron transfer reactions. Halfway through this Ph.D. studies at the University of Wisconsin, he became interested in biological aspects, noting that proteins engage in electron transfer reactions as well.

After finishing his Ph.D. in 1991, Petillo remained at Wisconsin to do high resolution NMR work and molecular modeling on biological systems. He worked on carbohydrates, looking at solution conformations and realized that his long range goal was to study protein-carbohydrate interactions inside cells. His second postdoctoral program was at the Whitehead Institute (at MIT) where he made templates to direct protein folding.

At Illinois he plans to combine these two areas of expertise to study protein-carbohydrate recognition and interactions within a cell. This complex area of study will require the techniques of molecular biology to make proteins and the tools of organic synthesis to create the appropriate carbohydrates. By studying protein-carbohydrate interactions, he hopes to be able to determine their

Pete Petillo

importance and to alter the mechanism by changing one or more elements in the interaction.

His work will have practical as well as theoretical significance. Petillo plans to research linear carbohydrates which play an important role in the stimulation and regulation of the immune system and may help in the battle against autoimmune diseases such as arthritis or osteoporosis. His work will be of interest to cancer researchers because it will help explain how malignant growths are able to protect themselves against penetration and destruction by antitumor drugs.

Petillo is very grateful for the "very generous" start-up package he received. His research is expensive because he requires two independent labs for his research, one for organic synthesis and one for molecular biology. He also appreciates the intangible help he has received. Because of the high level of integration within the School and the blurring of departmental divisions, colleagues from both organic and biochemistry have been friendly and exceedingly helpful.

In addition to all the above, he plans to capitalize on his extensive programming experience to computerize the advanced organic spectroscopy course. He is delighted that our infrastructure is in place to introduce computerization into advanced courses.

With the current School emphasis on crossing traditional divisional boundaries and on expanding computer based instruction, it is little wonder that Pete Petillo says, "I have felt extremely welcomed here and never considered another position after I received the offer from Illinois. Compared with my counterparts in other places, I think that I have the best situation in the country."

What does the U. of I. do for its Alumni?

Of course, the first and most important service the U. of I. ever offered you was an excellent education at a low price. For good reason, the U. of I. is considered one of the foremost educational bargains in the United States and its chemical science programs rank among the best nationally.

Our School of Chemical Science Placement Office offers two types of services to alumni. If you are searching for a new position, request the bi-monthly bulletin which lists all industrial, governmental, academic and post-doctoral positions of which we are notified. In addition, you can submit a "mini" resume to be included in the bi-monthly bulletin that is sent to approximately 300 industrial orgnizations.

The Alumni Association offers a variety of services to its members. The Alumni Career Center serves mainly the Chicago area and provides career counseling, job referrals, and career-related seminars. As a member, you have access to the Alumni Networking File, a database of more than 2,500 alumni nationwide who are willing to discuss your field of interest.

Members can receive discounts for rental cars at Hertz, Avis, National, and Alamo. You are eligible for low-cost insurance plans, including term life and major medical. You are eligible for a Designer Mastercard and Gold Mastercard, designed with the Block I logo and the Alma Mater Statue.

In the Chicago area, you can receive discounts on social, athletic and continuing education programs. No matter where you are, you can receive the Illinois Quarterly magazine and the LAS Newsletter. In most areas of the country (and abroad), you will find an Illinois alumni club nearby.

The LAS Alumni Association offer entertainment and education in Illinois and elsewhere. Included among its current offerings is a tour of Chicago churches, a forum in Washington, D.C. on "The Changing Political Power of Minority Groups in the U.S.", game tickets and a pre-game party for the Illinois-Iowa basketball game, and a variety of reunion activities. The College also offers a popular worshop on job searching as part of its alumni program.

If your giving level qualifies you for Presidents Council membership; you are entitled to a recent work published by the U. of I. Press and a windshield decal for your car which allows limited free parking at U. of I. parking meters.

You are also entitled to reading and loan privileges through the U. of I. Library System and to use the facilities of our Intramural Physical Education Building (IMPE). On January 1, 1995, the current minimal giving level of $1,000 annually or $10,000 lifetime giving for membership in the Presidents Council will increase to $1,500 annually or $15,000 lifetime giving. If you are considering joining the Council, you have a brief window of opportunity to join at the old rate before the end of the year.

Best of all, this newsletter from the School of Chemical Sciences brings you news of your friends and former colleagues and keeps you up-to-date on the news back here.

Braatz Studies Advanced Process Controls


Richard D. Braatz

Richard D. Braatz joined the department of chemical engineering after completing his Ph.D. from Caltech in 1993, followed by a post-doctoral year at DuPont. He is a Hertz Fellow and received the Hertz Doctoral Thesis Prize for his dissertation.

His primary research interests are in the development of approaches for the design, modeling, and control of large-scale industrial processes. Sheet and film processes are of particular interest and are of great importance to manufacturing, especially in the photographic, magnetic and optical memory, electronic, pulp and paper, polymer, and adhesive industries.

Successful control of these high-speed processes can improve product quality, reduce energy and material consumption, provide safer operation, and reduce pollution.

Braatz moved into a newly renovated office and laboratory which will house workstations purchased as part of his startup package. He currently has one student working in his laboratory, and several graduate students have expressed an interest in working with him this year. Accordingly, he is actively pursuing various funding sources in order to establish his research group.

One of the attractions of the University of Illinois was the potential for interactions and collaborations with faculty in other disciplines including mechanical and industrial engineering, electrical and computer engineering, the coordinated science laboratory, the national center for supercomputing applications, and the Beckman Institute.

Braatz chose Illinois because it is one of the nation's top schools not just in chemical engineering but also in other fields of engineering and chemistry. He wanted to work in a large public school where he would be able to contribute to the education of a great many students. Probably the most important factor was that this chemical engineering department had a cohesive faculty who welcomed his particular expertise.

Faculty Honors

Paul Lauterbur, Professor of Medical Information Science, Chemistry, Biophysics, and Bioengineering, and Director of the Biomedical Magnetic Resonance Laboratory, has received a 1994 Kyoto Prize for his work in medical technology. His research was pivotal in the development of the magnetic resonance imaging (MRI) scanner. The Kyoto Prize is a major international award which brings recognition for Lauterbur's achievements. The U. of I. is honored that the award has come to him.

Charles Zukoski, Professor and Interim Head of the Department of Chemical Engineering, has been selected a University Scholar for 1994-95, the university's highest award.

Peter Beak, Professor of Chemistry, has been named the 1994 recipient of the Harry and Carol Mosher Award from the Santa Clara section of the ACS. The award recognizes Professor Beak's contributions to organic chemistry research and his service to the profession in general and to the ACS in particular. Professor Beak will be the first Paul Gassman lecturer at the University of Minnesota in November.

Martin Gruebele, Professor of Chemistry) has received a David and Lucile Packard Fellowship for 1994.

Andrew Gewirth, Professor of Chemistry, received the Department of Educa; tion Award for outstanding accomplishments in materials chemistry. The award was given for his development of electrochemical applications of the atomic force microscope.

Kenneth Suslick, Professor of Chemistry, has been elected a Fellow of the Acoustical Society of America "For contributions to our understanding of sonochemistry and sonoluminescence." Professor Suslick also received the 1994 MRS Medal, given by the Materials Research Society for exceptional recent achievements in materials research. In addition, Professor Suslick was selected a University Scholar for 1994-95.

Nelson Leonard, R.C. Fuson Professor Emeritus of Chemistry, received the first Gassman Award for Service to Chemistry, sponsored by the Organic Division of the ACS. Professor Nelson was also named a Cope Scholar.

Nancy Makri, Professor of Chemistry, won a 1994 Cottrell Scholars Award.

William Schowalter, Professor of Chemical Engineering and Dean of the College of Engineering, was elected to the Council of the National Academy of Engineering for a three year term.

Because the proposal of **Peter Orlean,** Professor of Biochemistry, ranked first in the round of peer review of the American Cancer Society that awarded the Junior Faculty Research Awards, he was invited to present his work at "an exclusive meeting of esteemed American Cancer Society Research Professors."

William Pirkle, Professor of Chemistry, has received the 1994 ACS Award in Chromatography.

Jeffrey Moore, Professor of Chemistry has received a 1994 Camille Dreyfus Teacher-Scholar Award.

James Westwater, Professor Emeritus of Chemical Engineering, won the Ernest W. Thiele Award for 1994 from the Chicago Section of AIChE. The award was established in honor of Professor Thiele who received his B.S. in chemistry in 1919 from the University of Illinois.

Alkire Promoted to Vice Chancellor


Richard Alkire

Richard Alkire, the former head of the department of chemical engineering, has been promoted to vice chancellor for research and dean of the graduate college. Alkire is an outstanding scholar who was attracted to the new position because of the challenges it offered in a period of significant change in the research environement. "One of the challenges," he said, "will be to nurture the culture of research education on this campus." Another important responsibility in this changing environment, according to Alkire, will be to represent this university's "world-class research establishment" to the government and to business leaders who will play a part in its future.

An Eventful Year Has Passed

A newly appointed Dean of LAS, Dr. Jesse G. Delia, addressed the graduates at commencement. He said "I hope you will take great pride in your education as we take great pride in you." He assured them that they had received a world class education from one of the great educational bargains in the world and he expressed our gratitude to the parents who had thought sufficiently highly of our university to entrust their loved ones to us.

Professor Alex Scheeline of the Department of Chemistry remarked in his address to the students that the perfection of means and confusion of goals characterizes both chemistry and society at this time. He advised the graduates to "teach what you know, serve where you can and take advantage of unintended consequences to build a better and more stable world."

The students in the graduating class have made a good start. Compared with former years, an exceptional number among them have received departmental distinction, which requires that they complete a senior thesis and achieve a gradepoint average of at least 4.0 out of a maximum of 5.0.

The high quality of our student population is consistent with our data on reported salary offers. Of course, our students experienced the discouraging employment situation reported nationwide. Nevertheless, our reported salary offers compare favorably with the national figures of the College Placement Council at each degree level and for both men and women.

Further evidence of our continuing high quality comes from national rankings. A 1993 issue of *U.S. News and World Report* rankings of graduate academic programs showed that the U. of I. chemistry program ranked #6 in the nation, significantly higher than our basketball team. The rankings were based on questionnairs sent to department heads and directors of graduate studies at schools that granted doctoral degrees. Another indicator of confidence in the quality of our programs comes from the growing list of companies that sponsor undergraduate scholarships for our students. This year's list of winners shows a record number of new scholarships.

Graduation, May 1994

As other articles in this issue of the newsletter will show, the year has also seen a record number of changes in administrative positions throughout the School. All three department heads are newly appointed as well as the School's director.

The new faculty reflect the evolution of the field with increasing emphasis on areas of specialization that bridge traditional boundaries. The dynamic quality of the program is evident in our ability to recruit students, which has been undiminished despite demographic shifts and the weakness in the job market.

Excellence Needs Your Help

Help us to maintain and expand our programs by supporting Chemical Science Funds. We have listed below the most active funds in the three departments. If you would like to contribute to a fund not listed, please enter the name beside OTHER.

Matching gifts from your company multiply your dollars. If your company has a matching gift plan, please include a form from your company along with your contribution.

Remember - your contributions make a GREAT difference!

Mark the appropriate box. If sending a check, please make it out to UIF/(fund name). A preaddressed envelope is enclosed for your convenience.

- ❑ SCHOOL FACILITIES: Upgrades infrastructure, such as the machine and electronic shops, NMR, microanalytical, and mass spectrometry laboratories.
- ❑ ROGER ADAMS FUND: Supports the Roger Adams Professorship and funds teaching awards, relocation allowances, and undergraduate scholarships.
- ❑ FUSON FUND: Supports travel grants for graduate students attending professional meetings.
- ❑ CARL SHIPP MARVEL FUND: Supports the annual Marvel Lecture.
- ❑ BAILAR FELLOWSHIP FUND: Provides supplementary stipends for graduate teaching assistants.
- ❑ HAROLD SNYDER FUND: Supports undergraduate students during a semester of research.
- ❑ ADA DOISY LECTURE FUND IN BIOCHEMISTRY: Provides invited lectures of the highest distinction.
- ❑ THE CHE2000 FUND: Supports educational enhancement in Chemical Engineering.
- ❑ WESTWATER PROFESSORSHIP FUND: Supports a professorship in Chemical Engineering which is currently held by Professor Thomas Hanratty.
- ❑ ALUMNI PROFESSORSHIPS FUND: Supports professorships in Chemical Engineering currently held by Professors Anthony J. McHugh and Charles F. Zukoski.
- ❑ THE CHEMICAL ENGINEERING ANNUAL FUND: Provides seed money, instructional and research support.
- ❑ GENERAL FUND/CHEMISTRY: Provides start-up funds for new faculty and for other vital needs.
- ❑ GENERAL FUND/BIOCHEMISTRY: Provides start-up funds for new faculty and for other vital needs.
- ❑ OTHER _____

Your Name _____

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Address _____

City, State, Zip _____

Phone Number _____

Many thanks for your support

David Milligan

continued from page 2

which provided free test readers to labs who purchased the diagnostic kits.

The success with CEA was just one of many which propelled Abbott from nowhere in the seventies into worldwide leadership in diagnostics by the end of the eighties. It was a leadership built on solid science, and effective implementation of research and development programs and which lead to dramatic sales growth via new products.

Keeping Up With Science

According to Milligan, functioning effectively in an environment without sufficient information is one of the more difficult problems facing a scientific manager. A manager of a scientific enterprise needs a solid background in science and has to master the transition from working in the black and white realm of science to working in the gray area of human relations. At the same time he or she has to continue to nurture their scientific roots.

A good scientific manager has to be "solid" on the scientific side to be credible to technical coworkers. Milligan has devoted a great deal of time to learning new subjects as science has evolved. Although he does not need the level of expertise required for breakthrough scientific research, he has needed to learn the language and the basic principles of new scientific fields in order to be credible with his staff, to ask the important questions, to evaluate their findings and, occasionally, to offer helpful comments.

Intellectual Evolution

Looking back, Milligan can trace his intellectual evolution from his training as an organic chemist at the U. of I. to becoming a generalist as a manager of scientific enterprises, to constantly learning as new fields evolve. By reading a great many books and journals, Milligan has been able to develop an understanding of molecular biology, to maintain credibility in many novel fields, including photographic science, immunodiagnostics, monoclonal antibodies, and even the engineering aspects of diagnostics instrumentation.

Although he has delved increasingly into more descriptive scientific fields, he describes himself as "a fundamental believer in hard sciences, in quantification and in understanding basic principles and relationships and the magnitude and direction of effects."

Milligan came to the U. of I. from Princeton University, where he received his AB degree in Chemistry in 1963. He benefited from the small classes and superb teaching at Princeton and came to Illinois at the advice of Chris Enke, Illinois Ph.D. '59, who supervised his undergraduate research project. At Illinois he found a superb research environment where "you had to work your tail off" but it was worth the effort. Illinois offered unparalleled stimulation, great people and a magnificent infrastructure.

Although Milligan started his graduate career as an analytical chemist, he soon shifted to organic chemistry which he considered more practical from a career viewpoint and also more interesting. He truly enjoyed his interaction with the outstanding staff members at the University of Illinois and very much appreciated the solid guidance and support provided by his advisor, Stan Smith. He also managed to take a number of courses in the MBA program which "required an act of God" but were very helpful for his management career.

Today, from his vantage point as Corporate Vice President of Pharmaceutical R&D, Milligan still sees tremendous opportunity for well trained people to develop an understanding of how things work at the most basic level. "I believe," he said, "that hard work and the rational application of science will continue to pay off. In the future, industry will be scrambling to hire high quality talent. There is a tremendous need for more scientifically literate students evolving through the system. We have never had a greater need for public education and awareness in science and for the ability to critique the barrage of pseudo scientific information that comes from the press."

In closing, he said, "I believe that work should be fun and I am fortunate that it has been so for me. As managers we have to create an environment that will make work enjoyable for others. When people like going to work, they will work harder and look forward to facing the new challenges that each day brings." Milligan has faced many challenges in his exceptional career and his positive view of the future bodes well for additional challenges yet to come.

News flash: *As of October 1, Milligan has been promoted to Senior Vice President, Chief Scientific Officer at Abbott Laboratories, a newly created post. In his new position, he will help guide research and development strategies across the corporation.*

Local ACS Chapter Wins Phoenix Award

For its outstanding open house during National Chemistry Week, the East Central Illinois ACS chapter, along with the Illinois State Water Survey and the Illinois Hazardous Waste Research and Information Center received a Phoenix Award at the Washington, D.C. meeting of the ACS.

Five area high schools participated and sent students from chemistry and physics classes. Among the many demonstrations and displays was a polymer demonstration and a "Tools of Modern Chemistry" display. For the polymer demonstration, Don Seielstad, a student in the School's chemistry department, demonstrated the "Slime" experiment, devised by the Encouraging Tomorrow's Chemists group, which involves combining two liquids to form a more viscous material.

In another exhibit, solvent extraction of carotene from carrots, chlorophyll from spinach, caffeine from coffee, peanut oil from peanuts, and environmental pollutants from adsorbant resins were demonstrated and discussed. Analytical instrumentation was demonstrated with emission spectra from atomic absorption spectroscopy and graphics from capillary gas chromatography showing the separation of molecules as they move through a solution.

Mary Hagen-LeFaivre

Co-chairmen of the event were Mary Hagen-LeFaivre, Marv Piwoni and Carla Blue of the Hazardous Waste Research and Information Center, Karen Harlin of the Illinois State Water Survey, and John Pingle, of the University of Illinois Chemistry Department. Our section's activities have been reported in C&EN for the last two years as one of the annual outreach highlights. Mary reported that the group is already planning next year's events which, they hope, will bring even more area students to the open house.

RECOLLECTIONS

University of Illinois 1931-1936

By Sidney H. Babcock, Jr. Ph.D. '36

I lived in various rented rooms, eating where I could. One year, I ate at the chemistry frat house with, among many others, Herb Carter. (Carter, who received his Ph.D. in 1934, later became Professor of Chemistry, Head of the Chemistry Department, and Vice Chancellor of the University of Illinois.)

There was usually a quick bridge game after lunch. One of Herb's favorite ploys was to bid his partner up to a grand slam in no trumps, lay down a bust and dash off to work.

Later, five of us rented a large apartment two or three blocks off campus. We hired a cook and two others joined us for meals. Our room and board was $17.00 per month each. Since I was making $60 per month, I had enough money left over for clothing and the Friday night poker game. I remember I bought a tux complete with shirt, tie and studs for $20.00 which I still have (and can still wear.)

In the summer, we were paid 25 cents per hour for work in "summer preps" where we made chemicals, unavailable commercially, which were needed in the next year's research program. My first prep was a tear gas. It would be interesting to know what the hoods are like nowadays, but then they weren't even ventilated. Soon I was crying my eyes out. And I learned that, just as despondency can lead to crying, so crying can lead to despondency. As I went home, I passed a Catholic church and thought seriously of becoming a monk.

Safety was a minor consideration back then. One of the graduate students used to shake an ether-water mixture in a separatory funnel, turn it not quite upside down, open the stopcock to relieve the pressure and point the end of the funnel to a nearby open Bunsen flame and watch in perverse glee as the flaming ether shot back to the funnel.

At the start of my second summer preps, the storeroom keeper, in order to "protect" the drawers and cabinets under the bench tops, taped black tar paper across them - say 20 feet long by 3 feet high. The first flaming solvent spill set them afire and it was an exciting effort to get them out.

I had played the violin since I was five so, when I got to Illinois, I applied for a place in the orchestra. The director was Oscar Kubitz, whose appointment at this time was one-half in philosophy, two-fifths in German and one-tenth in the music school as concertmaster of the orchestra. He asked me what I played. When I said, "violin" he looked out the window. When I said, "also viola" he grabbed me by the collar, stuck a viola under my chin and music on a rack in front of me, and said, "Play" I became a fixture of the viola section of the orchestra.

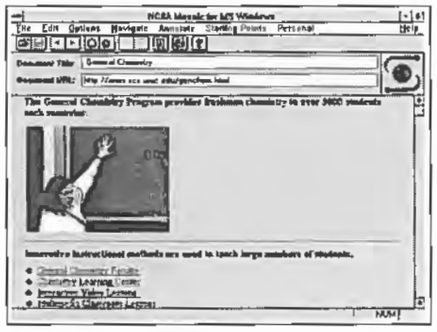
It happened that George Clark, head of the analytical division, and Lou Audrieth, professor of inorganic chemistry, were cellist and viola with Kubitz in a quartet. Since the second violinist was on leave, Oscar asked me to take his place. I did and played with the quartet every Monday night. I also played sonatas with several pianists, one of whom was Byron Riegel, who later became president of the American Chemical Society.

My life at Illinois was devoted entirely to chemistry and music. I was so busy that even the tux was worn only once.

Chem Program Information Enters Electronic Age

With a computer that can be hooked up to the world wide web, you no longer need read through brochures to get information on our graduate and undergraduate chemistry programs at the University of Illinois. With an internet connection, a program such as NCSA Mosaic, and software that connects Mosaic to the internet network, you can get information on your home or school computer on subjects such as (1) our undergraduate options, (2) research and graduate programs, (3) service facilities at SCS, (4) special lecture series, and (5) whom to contact for additional information.

One of the attractive features of the program is that it includes graphics, especially photos, in addition to text. When you meet the faculty after having browsed through the electronic information, you will recognize them as friends,



not strangers. Since the program is designed in a hypertext format, you will find a marked increase in the efficiency of your browsing because you can move directly to the subject of your choice or stroll through the entire contents to get a sense of our overall chemistry program and its offerings.

If your site already has NCSA Mosaic installed, you can reach the Department of Chemistry information by connecting to http://aries.scs.uiuc.edu. Alternatively, if you have an Internet connection without Mosaic, you can obtain a free copy of NCSA Mosaic by anonymous ftp to ftp.ncsa.uiuc.edu.

The chemistry information system has been designed and executed by Professor Stan Smith and Iris Stovall, Assistant Director of General Chemistry. Their signal achievement was to excerpt and modify existing written material such as the Graduate Brochure to optimize the contents for the new medium. With periodic updates, they will have a system in place where you can "let your fingers do the walking" especially if you have a mouse to jump you from one subject to another with the click of a button.

In Memoriam

Robert Baumann, M.S. '43 (Chemistry) died in March, 1944.

Gary Delaplane, BS '86 (Chemistry) died in February, 1994. He had been director of operations for Illini Pest Control, Inc. in Champaign since 1987.

Carl Kretschmer, Ph.D. '41 (Chemistry with Rodebush) died in January, 1994. He worked for the Northern Research Laboratory in Peoria for 17 years and then for Aerojet General Corporation in Azusa and San Romon in California.

Peter Lee, Ph.D. '67 (Chemistry with Kay) died in June, 1994.

David Moran, B.S. '85 (Chemical Engineering) died in October, 1993. He was a development engineer for Dravo Lime Company in Pittsburgh, PA.

C. Rexal "Rex" Scholfield, AM '41 (Chemistry) died in October , 1993. He was a retired chemist with the U.S. Department of Agriculture.

Roger Sonnemann, B.S. '40 (Chemical Engineering) died in December, 1993. He retired in 1983 as senior vice president and assistant to the president at AMAX Inc., a mining and metal company in New York. He received an honorary doctorate of laws in '68 from Blackburn College. Sonnemann served for six years on the Board of Directors of the U.S. Chamber of Commerce. He was a director of the American Society for Personnel Administration and a member of the Labor Policy Association, New York Board of Trade.

Professor Shriner Dies

Professor Ralph Shriner, who taught at the University of Illinois from 1927 to 1941, died in June, 1994 in Lincolnshire, IL. He published a classic textbook, "The Systematic Identification of Organic Compounds" which went through six editions and was translated into three languages.

After leaving the U. of I. he went to Indiana University in Bloomington as professor and chairman of the department. In 1947 he joined the chemistry faculty of the State University of Iowa in Iowa City where he taught until 1963, serving for a time as department chairman. After his retirement, he was a visiting professor at Southern Methodist University in Dallas until 1978.

In 1962 he received the Norris Award for outstanding achievement in the teaching of chemistry from the American Chemical Association. Professor Shriner received his Ph.D. at the U. of I. with Roger Adams in 1925.

Elmer B. Vliet, MS '19 (Chemistry) died in January, 1994. At the time of his retirement in 1962, he was chairman of the board of Abbott Laboratories, a position he had held since 1959. He had devoted his entire professional career to Abbott Laboratories, as manager and director of their Control Laboratories, and later as vice president and scientific administrator before becoming chairman of the board of directors.

Edwin G. Krebs

Krebs to Receive Honorary Degree

Professor Edwin G. Krebs received his B.S. in chemistry from the U. of I. in 1940 and went on to win the Nobel Prize in 1992. He is currently on the faculty of the University of Washington in Seattle. The Nobel award in physiology or medicine was given for his discovery of the crucial roles played by reversible protein phosphorylation in the regulation of biological processes. According to a letter of nomination, Krebs' discoveries can be characterized as "one of the most far-reaching breakthrough findings in molecular cell biology of the past half century."

Over the years, Krebs has maintained a warm attachment to the U. of I. and to the Urbana community, where he spent many years during his youth. He returned in 1989 to present the Biochemistry Department's prestigious Doisy Lecture and again in 1992 to receive the LAS College's Alumni Achievement Award. According to Professors Robert Switzer and Albert S. Feng, who jointly nominated Krebs for the honorary doctorate, "There can be no more fitting recognition of the accomplishments of this great scientist... than the award of an honorary degree from the University for which he has so much respect and affection." In response to the announcement, Professor Krebs answered, "It is a special pleasure for me to have been chosen for this honor by my alma mater."

KEEP IN TOUCH

Return to: Ellen Handler
SCS Alumni Newsletter
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Urbana, IL 61801

■ If you know someone who would like the newsletter and is not receiving it, please send address.

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

James P. Collman

Collman Wins LAS Award

James P. Collman, Ph.D. '58 with Fuson, has won a 1994 LAS Alumni Achievement Award. Dr. Collman is Daubert Professor of Chemistry at Stanford University and is recognized as one of the founders of the field of bioinorganic chemistry, especially for his work on metalloproteins. He has developed the "synthetic analog" approach to the study of metalloproteins and, in the field of organometallic chemistry, he has clarified the mechanisms underlying the reaction of molecules containing metal-carbon bonds. Most recently he has been developing a synthetic analogue for the biological pathway through which oxygen is converted to water by the enzyme, cytochrome c oxidase.

Dr. Collman has received innumerable honors and awards. He was elected to the National Academy of Science in 1975 and received the Churchill Award in 1977. In 1983 he was named California Scientist of the Year and received the ACS Award for Distinguished Service to Inorganic Chemistry in 1991. At the U. of I. he was the first Nelson J. Leonard Distinguished Lecturer in 1987.

Death by Chocolate

Graduate student, Jose Morales, holds the famous chocolate cake, Vera Mainz' specialty, that he won in the lottery for contributors to the campus charitable fund drive. The cake was presented under the eagle eye of Professor Speed Marvel, whose bust hovers over the proceedings.

Alumni News

'30

William Katz, B.S. '38 (Chemical Engineering) has retired from teaching Environmental Science at Oakton Community College and Roosevelt University.

Vernon Parker, B.S. '36 (Chemical Engineering) has retired from Goodyear in Akron, OH after 28 years of service as a patent attorney. He received his LL.B. from Marquette Univerisity in '39.

Richard Wiley, B.S. '34 (Chemistry) has retired as Professor at City University of New York-Hunter College. Dr. Wiley earned a Ph.D. at the University of Wisconsin in 1937.

'40

R. Byron Bird, B.S. '47 (Chemical Engineering) served as the first J.M. Burgers Professor in the Mechanical Engineering Department of the Technical University in Delft, the Netherlands. He is Professor Emeritus of Chemical Engineering at the University of Wisconsin in Madison.

William Mueller, B.S. '43 (Chemical Engineering) is director for process recovery at Cell Genesys Inc. of Foster City, CA.

Howard Rogers, B.S. '49 (Chemistry) is a senior scientist with Hughes Aircraft Co. in Torrance, CA.

J. Craig Yacoe, B.S. '41 (Chemical Engineering) has retired from DuPont. Since his retirement, he has invented the "geotangent dome," a variation on the Fuller geodesic dome.

'50

Bruce Beyaert, B.S. '58 (Chemical Engineering) retired as Principal Strategic Planning Consultant for Chevron USA Products Co.

Roy Broker, B.S. '52 (Chemical Engineering) retired from Elkem Metals Company in 1994 after 36 years of service with Elkem and its predecessor, Union Carbide Corporation.

James Copeland, B.S. '52 (Chemistry) has been named the 1993 recipient of the Segebrecht Distinguished Faculty Achievement Award at Kansas State University in Manhattan, KS. The award recognizes chemistry or chemical engineering professors who provide inspiration and excellence in teaching.

Richard Dannells, B.S. '57 (Chemical Engineering) retired from Air Products and Chemicals after serving 19 years in the patent department.

John Dismukes, Ph.D. '59 (Chemistry with Bailar) has been appointed a Fellow of the Electrochemical Society for his pioneering research. Since 1979 Dr. Dismukes has been with the Corporate Research Laboratory of EXXON Research and Engineering Company. He is Senior Research Associate in advanced materials research related to diamonds, structural materials, and inorganic composites.

Isaac Flesher, B.S. '53 (Chemical Engineering) retired from General Dynamics International in 1987.

Martin Goldstein, B.S. '55 (Chemical Engineering) is Second Vice President of the New York Intellectual Property Law Association. He received his J.D. in '64 from George Washington University.

Paul Jones, Ph.D. '56 (Chemistry with Fuson) reports that he was chairman of the history division of the American Chemical Society in 1994.

Harold A. Lindahl, B.S. '50 (Chemical Engineering) accepted a position as Adjunct Professor of Chemical Engineering at the Chicago and Wheaton Campus of the Illinois Institute of Technology after retiring from Amoco Chemicals in 1992.

Robert Nowak, Ph.D. '56 (Chemistry with Marvel) has been named president and CEO of Michigan Molecular Institute. MMI is a research facility specializing in new plastics. The facility has linked up with Michigan State University to do composites research. Dr. Nowak has retired from Dow Chemical Co. as chief scientist.

Edward Perkins, B.S. '56 (Chemistry) has received the first Stephen S. Chang Award for Lipid or Flavor Science awarded by the Institute of Food Technologists. Dr. Perkins is a professor of food chemistry at the U. of I. and was AOCS president during 1981. He received his PH.D. in food chemistry from the U. of I. in 1958.

'60

Dennis Arter, B.S. '69 (Chemistry) is owner of Columbia Audit Resources in Pasco, WA. He reports that the second edition of his book on quality auditing has been published by ASQC Quality Press.

James Bragg, Ph.D. '69 (Chemical Engineering with Westwater) is a senior research associate with EXXON's production research company in Houston, TX.

John Kardos, M.S. '62 (Chemical Engineering) was awarded the Francis F. Ahmann Chair in Chemical Engineering at Washington University. He has also been elected second Vice Chairman of the Materials Division of AIChE.

Craig Plassmeyer, B.S. '67 (Chemistry and Math) has earned an MBA from the U. of I. in 1969, is a CPA and a certified fraud examiner. He has started his own consulting business in Westlake Village, CA, in fraud investigations and management, out sourcing for law firms, banks, and health care.

Darryl Reach, MS '64 (Chemistry) is an instructor in chemistry at the University of Arkansas in Little Rock, AR. He will be developing a Science Education program, hopefully leading to an MST (Masters of Science Teaching) for Arkansas elementary and secondary science educators.

Sadao Tanimoto, MS '61 (Chemistry) is retiring from Ube Industries Ltd. in Tokyo.

James Taylor, Ph.D. '64 (Chemistry with Martin) has been awarded a John Bascom Professorship at the University of Wisconsin. Winners of this all-university award are chosen for broad excellence in research and teaching and in service to the university. The award is sponsored by the Wisconsin Alumni Foundation.

'70

Terry Balthazor, Ph.D. '75 (Chemistry with Martin) has been promoted to Director of Global Strategy and Operations of the Monsanto Agricultural Co.

Todd Brethauer, B.S. '73 (Chemical Engineering) has recently completed a three year tour of duty at the Joint Intelligence Center - Pacific in Pearl Harbor, HI, serving as Operations Officer and Chief, CYI and Requirements Division.

Wayne Ellison, B.S. '70 (Chemical Engineering) is a quality specialist with the 3M Company, Abrasive Systems Division.

Timothy Felthouse, Ph.D. '78 (Chemistry with Hendrickson) has become a Fellow at Huntsman Specialty Chemical Corporation in St. Louis, MO.

Richard Forbis, Ph.D. '70 (Chemistry with Rinehart) has taken a position as laboratory manager in the chemistry department of the University of North Carolina in Chapel Hill.

Scott Kennedy, Ph.D. '70 (Chemistry with Wood) is Assistant Dean of Admissions at the LSU Medical School in Chreveport, LA.

Timothy McCarthy, B.S. '76 (Chemical Engineering) has joined a new law firm which has been renamed Rittenhouse, Malek and McCarthy.

James MacMurdo, B.S. '75 (Chemistry) has been named treasurer of the American Society of Quality Control. He is manager of connector quality assurance for Ideal Industries in Sycamore, IL.

Sang Heup Moon, Ph.D. '74 (Chemical Engineering with Drickamer) became head of the Department of Chemical Engineering at Seoul National University.

David Roderick, B.S. '79 (Chemical Engineering) was promoted to Vice President, Refining, for the Bloomfield Refining Company in Bloomfield, NM.

Ikram M. Said, Ph.D. '77 (Chemistry with Coates) is with the University Kebangsaan Malaysia in Selangor Darul Ehsan.

'80

Doug Antelman, Ph,D. '89 (Biochemistry with Clark) has taken a position as staff scientist at Canji Inc. in San Diego, CA. He is conducting research on tumor suppressor genes.

Mark Bolek, B.S. '84 (Chemical Engineering) is a member of the technical staff of AT&T. He received his M.S. in '93 from Virginia Polytechnic and State University.

Peter Burban, B.S. '80 (Chemical Engineering) is a Process Engineering Consultant for The Lubrizol Corporation. He received a Ph.D. from the U. of Delaware in '84.

Jannette Carey, Ph.D. '83 (Biochemistry with Uhlenbeck) has been promoted to Associate Professor with tenure, the first and still only woman on the chemistry faculty at Princeton University.

Wen-Teh Chen, Ph.D. '86 (Chemical Engineering with Eckert) is a team leader in Materials and Process Operation at Hughes Space and Communications Co. in Los Angeles, CA.

Nancy Nichols Ferguson, B.S. '86 (Chemistry) is a staff environmental scientist with Radian Corporation in Herndon, VA.

Amy Fischer, B.S. '88 (Chemical Engineering) works for American Cyanamid as production superintendent for THIMET and COUNTER insecticides.

Fred Gibson, B.S. '84 (Chemical Engineering) is studying for his Ph.D. in polymer science at Virginia Tech in Blacksburg, VA. For the last six years he had worked at National Starch and Chemical Company.

Brian Grady, B.S. '87 (Chemical Engineering) is Assistant Professor in the School of Chemical Engineering and Materials Science at the University of Oklahoma in Norman. He received his Ph.D. fron the U. of Wisconsin in '94.

Bruce Hamper, Ph.D. '84 (Chemistry with Pirkle) has been appointed Associate Fellow in the Discovery Division or the Monsanto Agricultural Co.

Shridhar (Shri) Hegde, Postdoc '81-'84 (Chemistry with Coates) has been appointed to the Monsanto Fellow Program in the Monsanto Agricultural Company. This is a very significant appointment in the technical ladder at Monsanto since there are only 100 fellows in the entire company.

Erika Hendricksen, B.S. '89 (Chemical Engineering) is a Senior Product Engineer for Dow Chemical in California.

Masayuki Ishihara, Ph.D. '88 (Biochemistry with Conrad) is a research scientist with the Seikagaku Corporation in Tokyo, Japan.

Karen Klimas, B.S. '84 (Chemical Engineering) is Director of Environmental Programs for GE Capital Modular Space and TIP. She received her MBA from the U. of Pennsylvania in '93.

Kazuo Kondo, Ph.D. '81 (Chemical Engineering with Eckert) is with the Department of Chemical Process Engineering, Faculty of Engineering, at Hokkaido University in Sapporo, Japan.

Kurt Koppi, B.S. '88 (Chemical Engineering) is a senior research engineer with Dow. He received his Ph.D. in Chemical Engineering from the U. of Minnesota in '93.

Narha Lee, B.S. '84 (Chemistry) has received her MD from the U. of I. Medical School in Chicago and took a five year apprenticeship at Northwestern University. She is the first woman surgeon on the staff of St. Joseph, Sherman, and Delnor-Community Hospital in Elgin, IL.

William Lindsey II, B.S. '85 (Chemical Engineering) is employed by Quantum Chemical Corporation in Cincinnati, OH.

Robert Mallin, B.S. '85 (Chemical Engineering) is a patent attorney with the law firm of William Brinks Hofer Gilson & Lime in Chicago.

Mohammed (Akbar) Mehrsheikh, Postdoc '86-'87 (Chemistry with Coates) has been promoted to team leader in the Environmental Science Department at Monsanto.

Barbara Olson, B.S. '84 (Chemical Engineering) is Technical Manager responsible for Process/Product Engineering and Quality for the Rogers Corporation.

Michael Recny, Ph.D. '83 (Biochemistry with Hager) has taken a position as Senior Director of Biological Sciences for Parnassus Pharmaceuticals in Alameda, CA. He will be responsible for directing research activities of the molecular biology, cell genetics, biochemistry, molecular pharmacology, and structural biophysics groups in a new startup biotech company.

Martha Schlicher, Ph.D. '88 (Chemistry with Coates) has been promoted to Director of the Environmental Science Department at Monsanto. Dr. Schlicher is the youngest director in the history of the company and the only woman technical director ever appointed. Hers was the fastest promotion in the annals of the company. She is involved in the study for the registration of herbicides and manages a staff of 60.

Michael Smith, B.S. '88 (Chemistry) received a Ph.D. in organometallic chemistry from the University of California/Berkeley in 1993. He has taken a position as research chemist at EXXON Research and Development Laboratories in Baton Rouge, LA.

Tim Stephan, B.S. '82 (Chemical Engineering) is Group Manager in the Engineering and Maintenance Department at the Anheuser-Busch brewery in Cartersville, GA.

Ted Stoecker, B.S. '80 (Chemical Engineering) is the Propulsion Manager for the Taurus Launch Vehicle, which is produced by the Orbital Sciences Corporation.

Ronald Taibl, B.S. '84 (Chemical Engineering) is a research chemical engineer for Allied Signal in Des Plaines, IL.

'90

Zhenzheng Bao, Ph.D. '93 (Biochemistry with Horwitz) is a postdoc at the Dana Farber Cancer Institute.

Michael Bondi, B.S. '90 (Chemical Engineering) has received a J.D. from The John Marshall Law School and joined the Minneapolis law firm of Kinney & Lange as an associate.

Lee Boyle, Ph.D. '93 (Biochemistry with Karr) is a biochemist at Abbott Laboratories.

Phillip Carpenter, Ph.D. '94 (Biochemistry with Ordal) is a postdoc in the Department of Biology, at the U.C. Institute of Technology.

Kristin Coyner, B.S. '94 (Chemical Engineering) has accepted a position as project engineer in International Paper's Springhill Papers Division in Ticonderoga, NY.

Jon Culli, B.S. '92 (Chemistry) has accepted a position as chemist in the Rersearch laboratory of Specialty Coatings in Elk Grove Village, IL, a manufacturer of paint for coil coatings.

Kevin Dolbeare, B.S. '92 (Biochemistry) is a research assistant at the University of Minnesota. He has received an NIGMS Training Grant in Biotechnology.

David Egeland, Ph.D. '94 (Biochemistry with Schuler) is a postdoc in the Department of Biochemistry at Louisiana State University.

Jennifer Ekstrom, B.S. '90 (Chemistry) is a graduate student at Cornell University.

Nancy Gerber, Ph.D. '93 (Biochemistry with Sligar) is a postdoc in the Department of Pharm. Chemistry at the University of California in San Francisco.

Michael Graner, Ph.D. '93 (Biochemistry with Karr) is a postdoc in the Department of Cell Biology at the University of Arizona.

Matthew Gribbins, B.S. '94 (Chemical Engineering) is a graduate student at the University of Texas in Austin.

Beth Hacker, Ph.D. '94 (Biochemistry with Gennis) is a postdoc in the Department of Pharmacy, University of Washington.

David Hanlon, Ph.D. '93 (Biochemistry with Ordal) is a postdoc in the Department of Cell Biology at Harvard University.

Stephen Harding, B.S. '94 (Chemical Engineering) is a graduate student at Princeton University.

John Hill, Ph.D. '94 (Biochemistry with Gennis) is a postdoc in the School of Pharmacy, University of Wisconsin at Madison.

James Kelly, B.S. '94 (Chemical Engineering) is a graduate student at Columbia University.

Jackie Krejci, B.S. '90 (Chemistry) has accepted a position in the Pharmaceutical Products Division of Abbott Labs.

Eung Lee, B.S. '94 (Chemical Engineering) is a graduate student at Ohio State University.

Peng Luan, Ph.D. '94 (Biochemistry with Glaser) is a postdoc at Harvard Medical School.

Shannon Lurtz, B.S. '93 (Chemical Engineering) is an Associate Engineer with BFGoodrich Co.

Linqing Ma, Ph.D. '91 (Chemistry with John Shapley) is a technical manager in the Color Division of the Ferro Corporation in Cleveland, OH.

Bob Morris, Ph.D. '90 (Chemistry with Girolami) is an assistant professor at Ball State University in Muncie, IN.

Toru Nakamura, B.S. '93 (Chemistry) is a graduate student at the University of Colorado in Boulder.

Jane Nosal, Ph.D. '93 (Biochemistry with Switzer) is a resident at the University of North Carolina Hospital.

Michael Parent, B.S. '94 (Chemical Engineering) is a graduate student at the University of Minnesota.

Benjamin Tjoa, Ph.D. '94 (Biochemistry with Kranz) is a postdoc at Pacific NW Research Foundation.

Tim Wheeler, B.S. '92 (Chemical Engineering) is an engineer for M.H. Chew & Associates, Inc. in California.

Michael Willhoff, B.S. '94 (Chemical Engineering) is a graduate student at the University of Texas at Austin.

Joseph Yosick, B.S. '94 (Chemical Engineering) is a graduate student at the University of Wisconsin.

Becky Yu, B.S. '91 (Chemical Engineering) has taken a position as engineer at the Du Pont Co. in Parkersburg, WV.

Hong Xing, Ph.D. '93 (Biochemistry with Shapiro) is a postdoc at Attyman Research Institute.

Christine de Zutel, B.S. '92 (Chemical Engineering) is a process/project engineer at PPG Industries in Delaware, OH

THANK YOU

All of us at the School share the pleasure of hearing from you. Thank you for sending both your checks and your news. Your checks translate into important programs and services for our students and faculty and your news are interesting not only to us but also for your fellow alumni, our readers.

If you are looking for additional opportunities to invest in our program, for making an important difference to those who are here now and those who will be here in the future, contact

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Derald Keeps On Trucking

From 7 AM to 3 PM five days a week, rain or shine, deep snow or blistering heat, the friendly, silver and blue truck supplies coffee, fish sandwiches and other eats or drinks to its many regulars and others who just happen to stop by. Some of the regulars are so predictable that "I know what they're going to buy when I see them come down the sidewalk," according to Derald Seed, the owner.

Derald's South, as the catering truck in the chemical science complex is known, has been around for about 15 years. Recently, it's been joined by Derald's North that is also parked on Mathews but on the other side of Green Street. Derald's wife, Patsy, now helps out regularly and the business has grown to the level where it employs 4 full timers and 2 part timers. Another sign of the times is that chicken is beating out hamburger in popularity.

Derald Seed

Derald enjoys getting to know his customers. "Like a bartender, I see a lot," he says. "'As the catering truck turns' is a lot like 'As the world turns.' We see it all and know about it usually before it happens."

Word of the truck's offerings has spread well beyond the local community. One new customer recently reported that a friend in Georgia had told him that when he got to the U. of I. he had to get a fish sandwich at Derald's. A lot of people who return to campus make a stop at Derald's. Often he will recognize the face and remember the usual order, even though the customer's last visit may have been 5 years ago or more.

Derald plans to be around at least another eight to ten years. So, come back to campus. Take a tour of the new sights, visit the places you remember, and make a stop at Derald's for that wake-up cup of coffee and that great sandwich at noon.

SCS Alumni Newsletter
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