

---

# ALUMNI NEWSLETTER

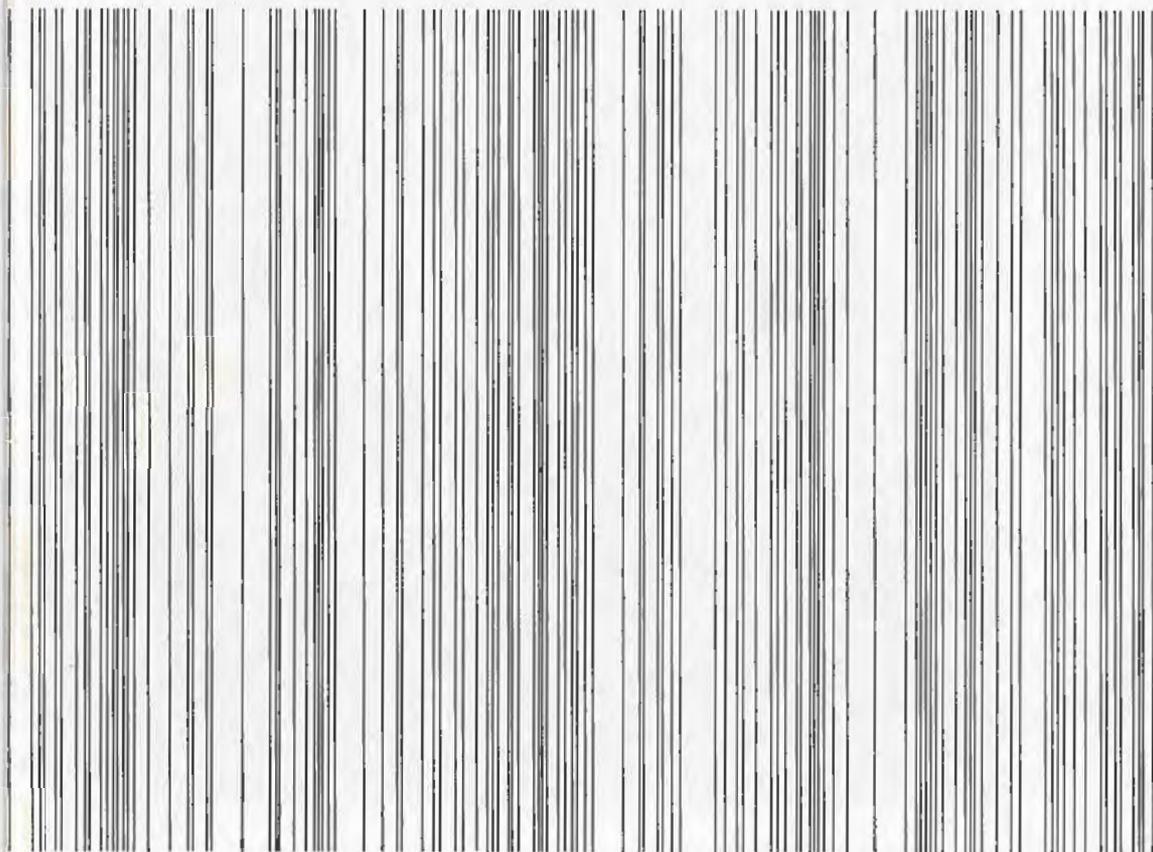
---

SCHOOL OF CHEMICAL SCIENCES

---

UNIVERSITY OF ILLINOIS at Urbana-Champaign

---



NO. 11, WINTER 1976-77



---

## The State of the Union

---

(Comments by H. S. Gutowsky, director of the School of Chemical Sciences)

Following the tradition of the last three issues of the *Alumni Newsletter*, I have put together a synopsis of some selected material that appears in much more detail in the *1975-76 Annual Report* of the School of Chemical Sciences and is not covered elsewhere in this issue. If you would like more details, let me know and I will be happy to forward you a copy of the complete annual report.

### Instructional Program

Two steps were taken during the past year to address the fact that 75 percent or more of our chemistry graduates take positions in industry without learning much in their programs about the nature of industrial careers. Professor Peter Beak organized a special topics course, Chemistry 433, Research in Industry, given in the fall semester. Early in the course, Dr. J. K. Stille from the University of Iowa presented a series of ten lectures on the fundamentals of industrial and polymer chemistry. This was followed by eleven weekly lectures from industrial speakers active in chemical roles. The program attracted a good deal of interest among our students and staff and its beneficial effects were visible to industrial recruiters interviewing here near its end. The second step was the inauguration of a cooperative program with Monsanto Company (St. Louis) for the summer employment of graduate students. Three entering graduate students participated in the summer of 1976, and it is hoped to extend the program to a larger number of students (and other companies) as well as to faculty next summer.

Efforts to encourage better teaching by our faculty and TAs continued throughout the year. The ad hoc Committee on the Evaluation of Instruction administered our own questionnaires (devised by the committee) to students in all sections of all courses and analyzed the results. Normative data of this sort are now required by the College of Liberal Arts and Sciences and the campus administration in the consideration of any faculty members for promotion. The committee also selected two faculty members, Professor John M. Clark, Jr., and Professor D. E. Applequist, and two TAs, Kenneth J. Christy and John A. Breese, for \$500 outstanding undergraduate teaching awards made by the school, with funds coming from the Eastman Kodak Company and the DuPont Company.

Undergraduate enrollments (majors) in the biochemistry program continued to increase (now 183, from 165); and, in addition, there was a sharp increase in chemical engineering enrollments for a second year in a row, now up to 297 from 239, including over thirty women. The increased enrollments in chemical engineering are straining the facilities and resources available to handle them. Graduate recruitment for 1976-77 admission was exceptionally good in chemistry (ninety-one) and the total graduate enrollment of the school is over 430 this fall.

### **Placement of Graduates**

The industrial employment picture during 1975-76 brightened somewhat from the previous year; at least it was not subject to as many on-again, off-again changes as we had in the previous year. In the fall recruiting schedule, 135 representatives of ninety-two companies interviewed job candidates here; there were only six cancellations. For the spring, there were 108 recruiters from seventy-nine companies, with eighteen cancellations.

The employment rate for chemical engineers who are U.S. citizens continues to be excellent. The decrease in traditional jobs in chemical companies has been overbalanced by the creation of new jobs concerned with pollution control and energy sources. The number of offers per job candidate in chemical engineering continued to be about twice that of biochemists and chemists; nonetheless, virtually all of the latter ended up finding suitable employment. A noteworthy point is that several of the graduate students in chemistry have opted to take an M.B.A. degree rather than an M.S. in chemistry. The industrial interest in the M.B.A. is significantly higher than in the M.S.; the average monthly salary offered to the former was \$1,426 compared to \$1,233 for the latter!

The information we have obtained on monthly industrial salaries accepted by our graduates indicates generally that salaries are up in proportion to inflation (~10 percent). There is considerable variability in the increases for different categories, in part because of the small sample sizes; however, the chemical engineering salaries appear to average a larger increase than the others. It is also of interest to compare the offers to men and women B.S. graduates for whom the numbers are perhaps large enough (twenty and fifteen, respectively) to give statistically significant averages. In any case, the average monthly salary offered to the men is \$980 while that to the women is \$1,100. Similar differentials apply to the other degree categories.

### **Affirmative Action Program**

In our recruitment of minority graduate students this year, we contacted thirty-three predominantly black schools by letter and by telephone. Two schools were visited this year -- Jackson State and Alabama A and M. The visits were made by two graduate students (Mr. Payne and Mr. Williamson) and by two faculty members (Dr. Katzenellenbogen and Dr. Stucky). A majority of the other schools contacted both by letter and phone either did not wish to be visited this year or did not have candidates. A number

of schools did suggest visitations in future years. The attractiveness of the health-related professions to science majors in these schools continues to severely hamper our ability to attract qualified applicants into careers in the chemical sciences. We received a total of three applications from black minority students. However, only one of these students was admitted for the 1977 academic year and he did not accept the appointment offered.

Our minority graduate recruitment program has been relatively successful in the past, as evidenced by the fact that it has been used as a model by the Minority Affairs Office of the University and by other departments on campus. Visitation of the schools and particularly the interactions with the faculty in these schools does appear to be important and will continue during the coming school year. Any help that the alumni can give in this direction would also be greatly appreciated. In addition, we hope to improve the effectiveness in the future of the invited lectures and scientific trips of our faculty in recruiting students from the minority schools that we have visited in the past.

The recruitment of women graduate students continued this year. Three years ago, only five accepted from some twenty-two offers; a year ago, thirteen from thirty-three offers, and this year, eighteen from thirty-six. About 20 percent of the graduate admissions in chemistry over the last two years have been women, which is above the national average.

The number of women students in chemical engineering is increasing. In 1975-76 two seniors and twenty-nine freshmen were women. These figures represent a fantastic increase for chemical engineering, as does the fact that two of the graduate students are women. The number of minority members seems to have leveled off. Two seniors are black, the same as a year ago.

### **Budgetary Problems**

For several years the annual report has included comments about one feature or another of the state budget that has presented problems. This year's report is no exception. The intense inflationary squeeze on operating expenses reported for the past six years continued in 1975-76, and led to the institution of service charges against research grants for use of the school's shops and service laboratories. It was a case of either cutting back essential general research functions by \$100,000 per year or transferring the charges to research grants and hoping that the latter could "absorb" the levy. The net effect is, of course, a reduction in the total amount of research being performed; the transfer of charges simply displaced the cut from one place to another.

Some relief is being provided by the University for 1976-77 in that about \$90,000 in new operating funds have been assigned to us. This represents a 16 percent increase but it is the first increase in five years. Thus, although some help has come our way, it is a small fraction of the deficiencies that have been accumulated. In an effort to demonstrate the magnitude of the latter to the College of Liberal Arts and Sciences and to the campus administration, an historical analysis has been developed, starting with 1969-70,

of the instructional demands being made upon the school and of the state funds provided to meet those demands. The analysis shows that while the budget for the College of Liberal Arts and Sciences as a whole has lagged behind inflation, the School of Chemical Sciences has fared much worse. The school's fraction of the budget has remained relatively flat while its fraction of the instructional load has increased nearly 35 percent over the nine-year period. If the school's fraction of the LAS budget had increased in direct proportion to its fraction of the instructional load, our state budget for 1976-77 would be \$1.4 million larger!

Needless to say, budget matters have been and will continue to be one of the primary (and most time-consuming) concerns of the director. However, any significant long-term help probably depends mainly upon a generally improving economy within the state to provide the additional state revenues needed.

---

### Computer-Based Teaching (PLATO) at Illinois

---

One of the most exciting educational innovations of the past decade at the University of Illinois has been the development of the PLATO IV computer-based teaching system, a large, highly sophisticated computer system devoted entirely to interactions with students. The PLATO IV system, developed by Dr. D. L. Bitzer and co-workers at the Computer-Based Education Research Laboratory on the Urbana-Champaign campus, can function as a private tutor to up to 500 students simultaneously, teaching such diverse subjects as chemistry, accounting, French, physics, and veterinary medicine. Of the 1,000 PLATO terminals connected to the Urbana-Champaign PLATO system, about 300 are located on this campus. In the chemistry PLATO classroom on the third floor of Chemistry Annex, twenty-nine of these terminals are used every day by students in general and organic chemistry classes.

Each semester, about 1,000 students studying general and organic chemistry use PLATO as a regular part of their classwork, spending one to two hours each week working PLATO lessons. Dr. Stanley Smith, professor of chemistry and chemical education, and Dr. Ruth Chabay, visiting assistant professor of chemistry, have developed most of the over ninety hours of instructional material available on PLATO for organic and general chemistry.

On a typical afternoon, the PLATO classroom is full of students, each working at a PLATO terminal, probably each on a slightly different topic. The PLATO chemistry lessons are written in a variety of styles and utilize different pedagogical approaches, but all of them allow a student to learn at the pace most comfortable for him. The lessons include tutorial dialogs between computer and student (in ordinary English), animations and other

computer graphics, simulated laboratory experiments, open-ended synthesis problems, chemical games, and problem-solving practice sessions.

For example, in a general chemistry lesson on the Aufbau principle, PLATO draws a set of circles representing electronic orbitals on the plasma display screen of the terminal. The student fills in the electrons in the proper configuration simply by touching the orbitals where he wants to put electrons. If he gets stuck, PLATO will provide help, and the chance to try another problem.

In another general chemistry lesson, the student solves ideal gas law problems by touching the screen to rearrange the symbols in the equation, then using a "calculator" provided by PLATO at the bottom of his display to plug in the numbers and calculate the correct answer. If he makes an error, PLATO gives specific corrective feedback: "You forgot to convert the temperature to degrees Kelvin," or "Your ratio is upside down."



Professors Ruth Chabay and Stan Smith at a PLATO terminal.

An organic chemistry lesson on substitution and elimination reactions asks a student to perform a set of simulated experiments to determine the dependence of the rate of reaction (n-butyl bromide with sodium ethoxide) on the concentrations of the reactants. He then watches animations of the  $E_2$  and  $SN_2$  reactions which produce the two different products. After re-

peating the same kind of experiments for the reaction of t-butyl bromide with sodium ethoxide, and watching animations of unimolecular substitution and elimination reactions, the student is led through a dialog on the stabilities of various types of carbonium ions. A practice problem set then lets the student identify various limiting types of reaction mechanisms.

Students prepare for a laboratory exercise on fractional distillation work with a PLATO lesson in which they must set up a distillation apparatus, correctly identifying and placing each piece; control the temperature; collect the fractions; and combine them in an attempt to get an adequate yield of each pure substance. In this simulation, the student learns about the possible pitfalls (heating the bath too rapidly, not collecting enough fractions) and their consequences before going into the laboratory. On PLATO, setting up the apparatus and trying the experiment again takes only a few minutes, rather than an entire laboratory period.

Near the end of the first semester organic chemistry course, students enjoy playing a PLATO game called The Great Synthesis Race. In this game, two students compete to see who can get from the starting point on the game board (the stockroom) to the end by synthesizing more of the compounds selected by PLATO in a limited number of steps. In this game students are not told whether or not they are on the right track — PLATO simply performs any chemical reaction specified by the student and draws the resulting product on the screen, telling the student when he has run out of steps, or when he has produced the desired compound.

In the senior-level qualitative organic analysis course (Chemistry 338) students often spend the first few laboratory periods reviewing with PLATO the basic chemical and spectroscopic analysis techniques and practicing the identification of unknown compounds before going to the real laboratory.

Last year, chemistry lessons written at the University of Illinois were used for over 50,000 hours by students at UIUC and other universities and colleges across the country. Student response to the use of PLATO at the University of Illinois has been enthusiastic. Students particularly like the fact that they can work at their own rates, at times convenient to them, and that PLATO gives immediate feedback on their errors and helps them figure out what mistakes they have made.

---

## New Staff Members

---

Four new faculty members have joined the School of Chemical Sciences this past year, one each in the Department of Biochemistry and the Department of Chemical Engineering and two in the Department of Chemistry. All join the faculty as assistant professors.



New staff members. Left to right: W. G. Breiland, K. J. Kaufmann, M. A. Stadtherr, and W. F. Mangel.

Two of the new faculty members, Dr. **Kenneth J. Kaufmann** and Dr. **Walter F. Mangel**, began their duties here last January. Professor Kaufmann came to the Department of Chemistry from the Bell Laboratories in Murray Hill, New Jersey, where he had served as a postdoctoral scientist since 1974. Before that he did postdoctoral work at the California Institute of Technology after receiving his Ph.D. degree from M.I.T. in 1973. His research interests involve the application of picosecond spectroscopy to fast reactions in chemical and biological systems.

Professor Mangel, who is jointly appointed in biochemistry and in the School of Basic Medical Sciences, has returned to the campus after a period of six years. He received his Ph.D. in biophysics from the University of Illinois in 1970 and then did postdoctorate work at the University of California at Berkeley and later for the Imperial Cancer Research Fund in London before coming back to Urbana-Champaign. His research here involves studies of the biochemical mechanisms involved in the transcription and translation of eukaryotic genes in the process of cell transformation.

The other new member of the Department of Chemistry faculty is **William G. Breiland** who arrived in August from Johns Hopkins University where he had been doing postdoctorate work since receiving his Ph.D. from the University of California at Berkeley in 1975. Breiland is a physical chemist whose research centers on the dynamics of excited-states in molecular organic crystals at low temperatures.

The new faculty member in chemical engineering is **Mark A. Stadtherr**. Professor Stadtherr is interested in mathematical modeling and simulation of industrial chemical processes. He also joined us in August, coming here from the University of Wisconsin where he completed his Ph.D. work this past spring.

---

## American Chemical Society Awards to Illini

---

Four of the American Chemical Society Awards announced at the San Francisco meeting of the society will go to past or present Illini.

Professor **Charles A. Eckert**, a member of our chemical engineering faculty since 1965 will receive this year's Ipatieff Prize which is awarded for outstanding experimental work in catalysis or high pressure. Eckert has made contributions in both fields, his most extensive research involving the use of high pressures to investigate the structure and properties of reaction transition states. Four years ago Professor Eckert was awarded the Allan P. Colburn Award by the American Institute of Chemical Engineers for the



C. A. Eckert



R. W. Parry

influence of his work on the theory, practice, and teaching of chemical engineering.

This year's ACS Award in Chemical Education will go to Professor **Robert W. Parry** (Ph.D., 1946). Parry, distinguished professor of chemistry at the University of Utah, has made outstanding contributions to the chemical education of not only his own students but also to students throughout the world through his activities in the ACS Division of Chemical Education, on the IUPAC Committee on the Teaching of Chemistry, and as a UNESCO special representative. Parry is an outstanding teacher, one who has greatly influenced his students as evidenced by the fact that more than thirty of his doctoral students are now teaching in college and university positions. He had previously been awarded the Manufacturing Chemists Association College Chemistry Teaching Award in 1972 and the ACS Award for Distinguished Service in Inorganic Chemistry in 1965.

Another Illinois Ph.D., Dr. **William J. Bailey** of the University of Maryland, will be receiving the ACS Award in Polymer Chemistry sponsored by the Witco Chemical Foundation. Among his outstanding contributions are the pioneering syntheses of the first all cis or trans diene polymers and of the first complete ladder and spiro polymers, polypeptides with unprotected side groups, biodegradable polymers, and a new group of monomers that polymerize with zero contraction. Bailey received his Ph.D. at the University of Illinois in 1946 and has been at the University of Maryland since 1951. He was president of the ACS in 1975.



W. J. Bailey



G. E. Gordon

The fourth ACS Award to go to an Illini is the Award for Nuclear Applications in Chemistry sponsored by G. D. Searle and Co. The recipient is Professor **Glen E. Gordon** (B.S., 1956) of the University of Maryland. Gordon, who has his Ph.D. from the University of California at Berkeley, is being cited for his use of instrumental neutron and photon activation analysis as a tool for doing multielement analyses. He has been particularly active in applying these methods to materials of geologic, atmospheric, and environmental importance.

---

## Other Awards and Honors to Faculty Members

---

Illinois faculty members were very much in evidence at the April meeting of the American Chemical Society in New York which featured special programs in recognition of the centennial of the society. Seven Illinois faculty members were featured speakers and one, Professor Emeritus **John C. Bailar, Jr.**, was honored at a special symposium on Giants in Chemical Education. Bailar was one of three honored at the special session for their contributions as teachers and scientists.



J. C. Bailar, Jr.



G. P. Haight, Jr.

Professor Gilbert P. Haight, Jr., was one of six this year who received a national Chemistry Teacher Award sponsored by the Manufacturing Chemists Association. He was selected for his success in motivating students toward a continuing desire for science education. The award was presented at one of the sessions of this year's orientation program for new teaching assistants that was conducted by the School of Chemical Sciences in August. Haight was the 1976 chairman of the ACS Division of Chemical Education.

Other notable recognition recently accorded faculty members in the School of Chemical Sciences is as follows:

Professor **John C. Bailar, Jr.**, was elected an honorary member of the Illinois State Academy of Science and a fellow of the Indian Chemical Society.

Professor **Theodore L. Brown** was chosen to give the Boomer Lectures at the University of Alberta.

Professor **Willis H. Flygare** was awarded an honorary D.Sc. degree by his alma mater, St. Olaf College.

Professor **David N. Hendrickson** was awarded an A. P. Sloan Research Fellowship beginning in September, 1976 and Professors **Kenneth J. Kaufmann** and **Gary B. Schuster** have been awarded Sloan Fellowships commencing this September.

Professor **H. A. Laitinen** (retired from Illinois in 1974, now at the University of Florida) was awarded the Gold Medal of the Society of Synthetic Organic Chemical Manufacturers for his work in environmental chemistry.

Professor **Howard V. Malmstadt** was the Venable Lecturer at the University of North Carolina.

Professor **Rudolph A. Marcus** received a Humboldt Foundation Senior U.S. Scientist Award.

Professor **Herbert S. Gutowsky** presented the twenty-third annual Gilbert Newton Lewis Memorial Lecture at the University of California at Berkeley.

Professors **Robert B. Gennis**, **Michael Glaser**, and **Daniel R. Storm** received five-year U.S. Public Health Service Career Development Awards.

---

### Other Honors to Alumni and Former Staff

---

The Alumni Association of the University of Illinois annually presents three Illini Achievement Awards to distinguished alumni at the May commencement exercises. This year two of the awards were presented to alumni from the School of Chemical Sciences. They were Professor **Carl "Speed" Marvel** (Ph.D., 1920) and Dr. **Arthur W. Sloan** (B.S., 1922).



C. S. Marvel



A. W. Sloan

Professor Marvel was a member of our faculty until 1965 when he "retired" to the University of Arizona where he is still active. While at the U. of I. he did pioneer research in polymer chemistry, laying the groundwork for much of today's technology in the field. Dr. Sloan, the founder and president of the Atlantic Research Corporation, which specializes in rocket propellants, has for several years sponsored the Agnes Sloan Larson Awards that are presented to our chemistry students who have the most outstanding records during the freshman year.

The Chemical Pioneer Award of the American Institute of Chemists was awarded to Professor **Edwin T. Mertz** (Ph.D., 1935) at the society's April meeting. Professor Mertz recently retired from Purdue University after thirty years on their faculty. The award recognizes his pioneering research on the lysine and tryptophan contents of various strains of maize which showed that some strains had exceptional nutritive value.



E. T. Mertz



P. J. Leider

The eighth annual George Olmsted Award of the American Paper Institute was awarded in October to Dr. **Philip J. Leider** (B.S., 1968), a group leader at the Westvaco Corporation Laurel Research Center in Maryland. The award, which recognizes original and outstanding research related to the paper industry, was presented to him for his work on disk refiner pressure-flow relations.



J. C. Cowan



K. Timmerhaus

Dr. **John C. Cowan** (Ph.D., 1938), now adjunct professor of chemistry at Bradley University, was selected by the Association Francaise pour l'Etude des Corps Gras as the non-French citizen to receive the Chevrueil Medal for outstanding contributions to better understanding of the chemistry of fats

and oils. This award recognizes his thirty years of research on soybeans and soybean oil at the USDA Northern Regional Research Laboratory in Peoria.

The newly elected president of the American Institute of Chemical Engineers is Professor **Klaus D. Timmerhaus** (Ph.D., 1952). Professor Timmerhaus is an associate dean of engineering at the University of Colorado and is a member of the National Academy of Engineering.

A former post-doc and faculty member, Professor **Stanley Wawzonek** of the University of Iowa, is the recipient of the 1976 Midwest Award presented by the St. Louis Section of the ACS. Wawzonek, who is being recognized for his work in electrochemistry and education, was on the faculty here from 1941 to 1943.

The 1976 Jacob F. Schoellkopf Award of the Western New York Section of the ACS was presented to Dr. **John R. McWhirter** (B.S., 1959). McWhirter is a general manager with Union Carbide at Westport, Connecticut. The award is in recognition of his work on the Unox process for waste water treatment.

Dr. **Fay V. Tooley** (Ph.D., 1939), emeritus professor of glass technology in the Department of Ceramic Engineering at Urbana-Champaign, has received the 1976 Toledo Glass and Ceramic Award from the Northwest Ohio Section of the American Ceramic Society for his contributions to the glass and ceramic fields.

Professor **Thomas Huang** (Ph.D., 1969) of East Tennessee State University was honored as the Speaker of the Year by the Northeast Tennessee Section of the ACS.

---

## Professor Harold R. Snyder Retires

---

Approximately forty former students of Professor Harold R. Snyder gathered in Urbana-Champaign on April 30 to participate in a symposium honoring him on the occasion of his retirement from the University. The two-day symposium highlighted recent work of some of his former students and associates. Approximately 200 attended the symposium dinner at the Ramada Inn at which Professor Nelson Leonard served as the master of ceremonies.

Professor Snyder, born in Mt. Carmel, Illinois in 1910, took his B.S. degree in chemistry at the University of Illinois in 1931 and his Ph.D. degree at Cornell University in 1935. After a year as a research chemist with the Solvay Process Company, he came to the University of Illinois as a special research assistant. In 1937 he joined the teaching staff as an instructor, progressing through the various academic ranks to become professor of organic chemistry in 1945 and associate head of the department from 1957 to 1960. Since 1960 he has been associate dean of the Graduate College, secretary of the Research Board, and research professor of chemistry.

During World War II, Professor Snyder carried on work for the National Defense Research Committee, the Committee on Medical Research, and the W. P. B. Rubber Research Program. He later served a term (1960-1963) on the National Research Council Committee Advisory to the U.S.



Participants in the Harold Snyder retirement symposium. Left to right: Ernest L. Eliel (University of North Carolina), Harold Moore (University of California-Irvine), Harold R. Snyder, Richard E. Heckert (duPont Co.), James H. Brewster (Purdue University), and Karl Folkers (University of Texas-Austin).

Army Research Office (Durham) in Basic Research. From 1961 to 1965 he served on the Advisory Panel, Course Content Improvement Section of the National Science Foundation. At the University of Illinois he directed the theses of 125 persons granted Ph.D. degrees in organic chemistry. He has published approximately 170 scientific articles and has been a co-author of two textbooks. Although his retirement became effective last January, he is still often seen in the halls of Roger Adams Lab, as he is still residing in Urbana.

---

### Professor G. F. Smith Dies

---

Dr. G. Frederick Smith, emeritus professor of chemistry and co-inventor of the aerosol spray can died September 23 in Urbana. It was in 1934 that Professor Smith and Charles A. Goetz (Ph.D., 1938), then an assistant in chemistry, patented their method of dispensing whipped cream under pressure. It dramatically lightened the tasks of corner drugstore soda fountains and quickly was marketed for use in the home.



G. F. Smith

An Ohio native, Dr. Smith attended Ohio State University for two years, then left to become a roustabout on lake and ocean freighters. He returned to studies at the University of Michigan where he earned a B.S. degree in 1917, M.S. in 1919, and Ph.D. in 1921.

He joined the University of Illinois faculty in 1921 and three years later founded the G. Frederick Smith Chemical Co., setting up a laboratory in the garage at his Urbana home. In 1928 the business, a pioneer in the manufacture of perchloric acid, was moved to Columbus and the company now sells more than 350 analytical chemicals worldwide. The process for dispensing whipped cream patented by Dr. Smith and Dr. Goetz was developed by Professor Smith and several associates into Aeration Processes,

Inc., which now has plants in forty-five major cities. Formerly president, Dr. Smith was chairman of the board of both companies in 1968-76.

Long active in the American Chemical Society, he had chaired two of its divisions and was a recipient of the society's Fisher Award. He was a member of a number of other professional organizations and was co-author with Professor Harvey Diehl of a text, *Quantitative Analysis*, in 1952. Professor Smith retired from the University in 1955.

---

## Special Lectures

---

The School of Chemical Sciences is fortunate to have several special lecture series each year to supplement the regular seminar programs conducted by the various areas within the school. These special series are funded by grants or trust funds specifically set up to make it possible to attract outstanding scientists to the campus to lecture on their specialties. The most recent programs in these series are described in the following paragraphs.

### William Albert Noyes Lecture

Phi Lambda Upsilon, the sponsor of the William Albert Noyes Lecture, was founded in March of 1899 at the University of Illinois. On the occasion of the fiftieth anniversary of the society's founding, the Alpha Chapter initiated the Noyes Lecture series. Appropriately, William Albert Noyes, Jr., was the first speaker. The most recent speaker was former University of Illinois faculty member Carl "Speed" Marvel who discussed his sixty-five years in chemistry on the occasion of the annual Phi Lambda Upsilon dinner in March. Professor Marvel retired from our faculty in 1961 and is currently on the staff at the University of Arizona.

### Krug Lecture

The second annual Krug Lecture sponsored by the local chapter of Alpha Chi Sigma was given in April by Professor Henry Eyring of the University of Utah. Eyring, internationally known for his work in chemical kinetics, spoke on "Cancer, Mutations, and Aging." The Krug Lecture is funded from a trust fund established by Mrs. Krug in honor of her husband, Louis C. Krug, who graduated from the University of Illinois in 1918.

### Sherwin-Williams Lectures

For several years, we have enjoyed having internationally known scientists visit the School of Chemical Sciences under the sponsorship of the Sherwin-Williams Seminars in Chemistry grant. In June of this year, Professor Roald Hoffmann of the Chemistry Department at Cornell University presented a series of three lectures on theoretical organic chemistry in which he dis-

cussed bonding in transition metal carbonyl fragments, factors influencing metal-metal bonding, and the structure of organometallic complexes.

During the current academic year, plans have been made for several lectures in the Sherwin-Williams series. Professor Gabor Somorjai (California-Berkeley), Professor Benjamin Widom (Cornell), and Professor Robin Hochstrasser (Pennsylvania) will present a series of talks on recent advances in chemical physics, and Professor Al Meyers from Colorado State University will present a series on synthetic organic chemistry.

#### Doisy Lecture

The fifth annual Doisy Lecture in Biochemistry was held in October, with Dr. Luis F. Leloir as the guest lecturer. The topic of his lecture was "The Role of Dolichol Phosphate in Protein Glycosylation." Dr. Leloir is director of the Campomar Foundation Institute of Biochemical Research in Buenos Aires, Argentina and was the recipient of the Nobel Prize for Chemistry in 1970 for his discovery of new phosphorylated intermediates, especially those involved in the synthesis of sugar, starch, and glycogen.

The Ada A. Doisy Lectureship was established in 1970 by a gift from Dr. Edward A. Doisy in honor of his mother, and the first lectures were held in the spring of 1971. Dr. Doisy is a professor of biochemistry emeritus, St. Louis University and was a Nobel Prize winner in 1943. He is an alumnus of the University of Illinois, Urbana-Champaign campus.

#### Bailar Lecture

The Bailar Lectureship was established in 1969 when colleagues, friends, and former students of Professor John C. Bailar started the supporting fund now known as the John and Florence Bailar Fund. The fund was established on the occasion of Professor Bailar's sixty-fifth birthday. This year's Bailar Lectures were presented in October by Dr. George W. Parshall of the Central Research Laboratories of the duPont Company. Dr. Parshall, who received his Ph.D. degree from the University of Illinois in 1954, gave two lectures on carbon-hydrogen bond activation in aromatic and aliphatic compounds.

---

### Awards to Students

---

For the 1976-77 academic year, seven \$500 scholarships were awarded by the school to freshmen entering the University and planning a professional career in one of the chemical sciences. Of these, two are in chemical engineering and five in chemistry with five being funded from the income of the Roger Adams Fund, one from the L. F. Audrieth Fund, and one by a grant from Monsanto. These students, and their home towns, are as follows:

Michael L. Biehl (Urbana) (Monsanto Grant)  
 Paul R. Fetty (Chicago) (Roger Adams Fund)  
 Thomas J. Grzesiak (Dolton) (Roger Adams Fund)  
 Joseph S. Helfand (Springfield) (Roger Adams Fund)  
 Wendy A. Olson (Lisle) (Roger Adams Fund)  
 Terry R. Urban (Geneseo) (Audrieth Fund)  
 Howard W. Weiss (Wilmette) (Roger Adams Fund)

The Agnes Sloan Larson Awards, in the amount of \$200 each, were presented on February 26, 1976, before the Chemistry 108 class to the five sophomore students whose academic work during their freshman year was most outstanding:

Joel R. Garbow, Park Forest  
 Paul S. Hummel, Champaign  
 Henry A. Kroner, Homewood  
 Gary R. Pineless, Skokie  
 Gary G. Shull, Charleston

The Agnes Sloan Larson Awards were established in 1959 by Arthur W. Sloan (B.S., 1922) in honor of his sister, Mrs. C. C. Larson, who was a chemistry major at Illinois and valedictorian of the Class of 1919. The awards are presented during the recipients' sophomore year before the freshman class of the succeeding year.

During the spring semester, a number of undergraduate awards based on academic excellence were announced by the School of Chemical Sciences Awards Committee. These are summarized below:

<b>Algernon Dewaters Gorman Prize</b>	Paul A. Olson, Joliet
<b>Reynold C. Fuson Award</b>	Daniel C. Duan, Quincy
<b>Worth H. Rodebush Award</b>	Cynthia J. Baits (chemistry), Rockford
	Mark A. Stanish (chemical engineering), Elmhurst
<b>Kendall Award</b>	Charles F. Huber, Champaign
<b>Merck Award</b>	Charles F. Huber (chemistry), Champaign
	James L. Barbour (chemical engineering), Homewood
	John T. Schousboe (biochemistry), Urbana
<b>American Institute of Chemists Award</b>	Cynthia J. Baits (chemistry), Rockford
	Michael E. Hanley (biochemistry), Midlothian
	Mark A. Stanish (chemical engineering), Elmhurst

Donald Eisele Memorial Award	Philip L. Bateman, Decatur
American Institute of Chemical Engineers Scholarship Award	Thomas S. Wittrig, Danville
Freshmen CRC Handbook Award	Louise H. Allen, Champaign
Illinois Institute of Chemists Award	Mark A. Stanish, Elmhurst
Harvey H. Jordan Award (Engr. Coll.)	Mark A. Stanish, Elmhurst
Phi Lambda Upsilon Cup	Joel R. Garbow (chemistry), Park Forest
	Paul S. Hummel (biochemistry), Champaign
	Henry A. Kroner (chemical engineering), Homewood
	Gary A. Peltz (biochemistry), Chicago
Elliott R. Alexander Award	Gary R. Pineless, Skokie

In addition to the above awards which are part of the school awards program, an undergraduate majoring in the teaching of chemistry program, Glenn P. Hummel from Champaign, was this year's campus recipient of the Big Ten Medal of Honor for excellence in scholarship and athletics. Glenn was the captain of the 1975-76 Illini tennis team.

Graduate students receiving special awards this year were Al Nadzan, a graduate student in organic chemistry who won second prize in the annual campus student paper competition conducted by Sigma Xi, and John Breese and Ken Christy who received \$500 awards sponsored by the Eastman Kodak Company for outstanding work as teaching assistants in the general chemistry program.

---

### School of Chemical Sciences Funds

---

The alumni and friends of the School of Chemical Sciences have shown their loyalty in many ways, not the least of which has been through financial contributions to various funds which support the work of the school. Of special interest are the Roger Adams Fund, the Illini Chemists Fund, the John and Florence Bailar Fund, the R. C. Fuson Fund, the W. H. Rodebush Fund, and the L. F. Audrieth Fund. Contributions to these funds have totalled almost \$15,000 over the past year, the vast majority of which has come from alumni.

The purposes of these funds are many and varied but primarily involve the support of undergraduate scholarships and awards (the Adams, Fuson, Rodebush, and Audrieth Funds), the support of special lectures (the Bailar



Hudgens, Jeffrey Warren      Physical      J. D. McDonald  
Naval Research Laboratory, Dayton, Ohio  
"Infrared Chemiluminescence Study of Reactions between Oxygen Atoms  
and Carbon Disulfide and Oxygen Atoms and Actylenes"

Ley, David Arthur      Organic      R. M. Coates  
American Cyanamid Co., Stamford, Connecticut  
"The Mechanism of the Biosynthesis of Kaurene"

Miguel, Antonio Horacio      Analytical      D. F. S. Natusch  
Department of Chemistry, California Institute of Technology, Pasadena,  
California  
"Studies of Gas-Solid Reactions of Environmental Significance: I. Pyrene  
Adsorption onto Fly Ash II. Thiol Oxidation and Adsorption by Activated  
Carbon"

Pigott, Henry Dale      Organic      R. M. Coates  
duPont Co., Sabine River Lab, Orange, Texas  
"Sulfur Directed Ketone Alkylations"

Stocker, Verena (Holzer)      Physical      D. Secrest  
Department of Chemistry, Princeton University, Princeton, New Jersey  
"A Formalism for Multiple Scattering"

Zilker, Daniel Paul, Jr.      Chemical Engineering      T. J. Hanratty  
Department of Chemical Engineering, University of Illinois, Urbana, Illinois  
"Flow Over Wavy Surfaces"

#### Ph.D. Recipients in May, 1976

Desiraju, Gautam Radhakrishna      Organic      D. Y. Curtin  
Eastman Kodak Company, Rochester, New York  
"Part I. Redox and Structural Features of Quinone-Hydroquinone 1:1  
Complexes. Part II. The Thermally Initiated Rearrangement of 2-(4'-  
Methoxy-henyl)-1, 4-Benzoquinone in the Solid State"

Gruber, Bruce Alan      Organic      N. J. Leonard  
GAF, Binghamton, New York  
"Intramolecular Stacking Interactions Determined by Fluorescence Quench-  
ing"

Mitchell, Arnold Hoselton      Inorganic      R. S. Drago  
Brookhaven National Laboratory, Upton, New York  
"Physical Studies of Iron(II) Spin Equilibrium Complexes Containing Hex-  
adentate Ligands and Thermodynamic and Kinetic Studies of Rho-  
dium(I) Phosphine Complexes and Mixed Ligand Rhodium(III) Di-  
hydrides"

- Li, Marinda Pasadena                      Inorganic                      R. S. Drago  
Dow Chemical USA, Walnut Creek, California  
"Thermodynamic and Spectroscopic Studies of Reactivity and Bonding in  
Transition Metal Lewis Acid-Base Systems"
- Mirarefi, Ali Asghar                      Chemical Engineering                      R. C. Alkire  
Mirarefi & Sons, Tehran, Iran  
"Experimental and Theoretical Investigations of Multiple Reactions in a  
Tubular Electrode under Steady Laminar Flow"
- Ng, Patrick Kwok-Yeung                      Chemical Engineering                      R. C. Alkire  
Allied Chemical, Syracuse Technical Center, Solvay, New York  
"Electrochemical Packed Bed Reactors"
- Noid, Donald William                      Physical                      R. A. Marcus  
Department of Chemistry, University of Illinois, Urbana, Illinois  
"Studies in Molecular Dynamics"
- Plichta, Roman Thaddeus                      Chemical Engineering                      R. A. Schmitz  
Amoco, Naperville, Illinois  
"Oscillations in the Oxidation of Carbon Monoxide on an Unsupported  
Platinum Catalyst"
- Northern, Tina Marie                      Physical                      R. L. Belford  
Chung-Yuang Christian College, Chemistry Department, Chung-li, Taiwan  
"The Determination of Nuclear Quadrupole Coupling Constants from  
Powder EPR Spectra"
- Roll, David Eugene                      Biochemistry                      H. E. Conrad  
Department of Biochemistry, University of Pittsburgh, Pittsburgh, Penn-  
sylvania  
"Effects of Growth Conditions on the Carbohydrate Composition Normal  
and Transformed Chick Embryo Fibroblasts"
- Sweany, Ray Lewis                      Inorganic                      T. L. Brown  
Department of Chemistry, University of Chicago, Chicago, Illinois  
"The Use of Matrix Isolation Spectroscopy in the Characterization of  
Dicobalt Octacarbonyl and the Charge Transfer Complex Tetrathioful-  
valene and Tetracyanoquinodimethan"
- Varijian, Richard Dicran                      Chemical Engineering                      R. C. Alkire  
Central Research Inorganic Laboratory, Dow Chemical, Midland, Michigan  
"The Current Distribution Along Stationary and Moving Resistive Wire  
Electrodes"

Wierner, David Francis            Organic                            N. J. Leonard  
Department of Chemistry, Cornell University, Ithaca, New York  
"Chemical and Radiative Modification of Nucleic Acid Bases"

Woodruff, Terry Alaric            Analytical                            H. V. Malmstadt  
Hewlett-Packard, Avondale, Pennsylvania  
"An Automated ARC/Flame Spectrometer System"

**Ph.D. Recipients in October, 1976**

Arter, David Bruce                Physical                                P. G. Schmidt  
5950 West Missouri, Glendale, Arizona  
"Proton Magnetic Resonance Studies of Nucleic Acids in Solution"

Bertucci, Sidney Joseph            Physical                                W. H. Flygare  
Eastman Kodak Research Labs, Rochester, New York  
"Light Scattering Studies of Orientational Pair Correlations in Pure Liquids  
and Mutual Diffusion in Binary Solutions"

Christopfel, William Charles        Organic                                K. L. Reinhart, Jr.  
Monsanto Company, St. Louis, Missouri  
"Synthesis of Slaframine and Related Compounds"

D'Aniello, Michael J.                Inorganic                                E. K. Barefield  
Department of Chemistry, Cornell University, Ithaca, New York  
"The Mechanism of Nickel(I)-Catalyzed Olefin Isomerization and the  
Preparation and Properties of Paramagnetic Nickel(II) Alkyl Complexes"

Davis, Jimmy Henry                 Inorganic                                G. D. Stucky  
Department of Chemistry, University of Florida, Gainesville, Florida  
"Part I. Reactions of Tetracyanoethylene Oxide with Low Valent Metal  
Complexes. Part II. Chemistry of Low Valent Titanium and Zirconium  
Organometallic Compounds."

Delker, Gerald Lee                 Inorganic                                G. D. Stucky  
University of California at Davis, Davis, California  
"Temperature Dependent Studies of Structural and Electronic Effects in  
Single Crystals"

Finney, Raymond Joseph            Physical                                J. Jonas  
Department of Chemistry, University of Illinois, Urbana, Illinois  
"High Pressure Nuclear Magnetic Resonance Studies of Transport Properties  
in Dense Fluids"

- Gravel, Philip Larry                      Organic                      W. H. Pirkle  
Amoco Chemical Corporation, Naperville, Illinois  
"Synthesis, Isolation and Characterization of Cyclic Diacyl-hydrazyl Radicals"
- Johnson, Elijah                      Chemical Physics                      D. Chandler  
Chemistry Division, Oak Ridge National Lab, Oak Ridge, Tennessee  
"A Perturbation Theory for Classical Atomic Fluids"
- Jungst, Rudolph George, II                      Inorganic                      G. D. Stucky  
Sandia Laboratories, Albuquerque, New Mexico  
"Electron Exchange Interactions in Dimeric Copper(II) and Titanium(III) Complexes and Electron Paramagnetic Resonance of a Highly Conducting Charge Transfer Salt"
- Kitko, David J.                      Inorganic                      R. S. Drago  
Sharon Woods Technical Center, Proctor & Gamble Co., Cincinnati, Ohio  
"Binuclear Complexes of Cobalt, Nickel and Copper and Activation of Molecular Oxygen by Transition Metal Complexes in the Oxidation of Olefinic Substrates"
- Laskowski, Edward John                      Inorganic                      D. N. Hendrickson  
Department of Chemistry, Stanford University, Stanford, California  
"Magnetic Exchange Effects in Outer-Sphere-Associated Metal Dimers and in Oxidized Manganese(II) Schiff Base Complexes"
- Lee, May Dean Lu                      Organic                      K. L. Rinehart, Jr.  
Department of Chemistry, Harvard University, Cambridge, Massachusetts  
"The Chemistry and Structures of Aureofungins A and B"
- Luteri, George Frederick                      Organic                      W. T. Ford  
Velsicol Company, Chicago, Illinois  
"Cycloadditions of 2-phenylallylmagnesium Phenoxide, 2-phenylallyllithium and 2-cyano-1,3-diphenylallyllithium to Olefins"
- Michael, Paul Riley                      Analytical                      L. R. Faulkner  
Monsanto Company, St. Louis, Missouri  
"A Study of Some Energy Sufficient Electrogenerated Chemiluminescent Reactions"
- Miller, Thomas Craig                      Analytical                      L. R. Faulker  
Proctor & Gamble Co., Cincinnati, Ohio  
"Computer Assisted Structural Interpretation of Fluorescence Spectra"

Nadzan, Alex Michael                      Organic                      K. L. Rinehart, Jr.  
Department of Chemistry, MIT, Cambridge, Massachusetts  
"Studies on the Biosynthesis and Bioactivities of Nybomycin and Its Derivatives"

Otto, Charlotte Ford                      Organic                      N. J. Leonard  
Department of Chemistry, University of Michigan, Ann Arbor, Michigan  
"Intramolecular Stacking Interactions. A Study in Three Parts"

Paulaitis, Michael Edward              Chemical Engineering              C. A. Eckert  
Department of Chemical Engineering, University of Delaware, Newark, Delaware  
"Molecular Thermodynamics and Knudsen Cell-Mass Spectrometer Studies of Liquid Metal Mixtures"

Raj, Tilak                                      Physical                      W. H. Flygare  
Department of Chemistry, University of Minnesota, Minneapolis, Minnesota  
"Applications of Laser Light Scattering Spectroscopy to Biopolymers"

Richman, Robert Michael              Inorganic                      R. S. Drago  
Department of Chemistry, California Institute of Technology, Pasadena, California  
"Novel Studies of Transition Metal Dimers"

Ruyechan, William Thomas              Physical                      J. G. Wetmur  
Committee on Virology, University of Chicago, Chicago, Illinois  
"Selected Interactions of Nucleic Acids with Proteins and Small Molecules"

Ryan, Rick Lee                              Biochemistry                      W. O. McClure  
Department of Biochemistry, University of Wisconsin, Madison, Wisconsin  
"Choline Acetyltransferase from Rat and Bovine Brain: Purification and Some Properties"

Shaw, Dudley Arthur                      Chemical Engineering              T. J. Hanratty  
Bioengineering Dept., Monsanto Co., St. Louis, Missouri  
"Mechanism of Turbulent Mass Transfer to a Pipe Wall at High Schmidt Number"

Sikkenga, David Lee                      Organic                      W. H. Pirkle  
Amoco Chemical Company, Naperville, Illinois  
"Diastereomeric Interactions of Sulfoxides, Lactones and Aryl Trifluoromethyl Carbinols"

Theiler, Richard Frederic      Biochemistry      W. O. McClure  
Department of Biochemistry, University of Illinois, Urbana, Illinois  
"Fractionation of Rapidly Transported Proteins in Normal and Regenerating  
Neurons"

Turfa, Alexander Frederick, III      Chemical Physics      R. A. Marcus  
Huygens Lab, Leiden, Netherlands  
"Semiclassical and Classical Theories of Molecular Rotational Phenomena"

Williamson, Alex Nathan      Inorganic      E. K. Barefield  
Monsanto Polymers & Petrochemicals, Monsanto Company, St. Louis,  
Missouri  
"Preparations and Studies of Cyclopentadienylbis(Ligand)Nickel(I) Com-  
plexes"