Cornell Chemistry

April 1998 Number 69

The Chairman's Notebook

Cornell University, and particularly its Department of Chemistry, is an institution with a long history of commitment to undergraduate research, a topic featured in this issue of *Cornell Chemistry*. More than 3,000 students from across campus participated in undergraduate research during the past academic year, and that number has been steadily increasing. A new program recently introduced by President Rawlings will bring the research experience even to a select group of incoming freshmen. In the Department of Chemistry, where we have roughly 60 chemistry majors per year, 39 students took undergraduate research last year for credit, and another 9 performed research as part of their work-study program. It is little wonder that, overall, Cornell ranks right behind Berkeley in the number of undergraduates who apply to graduate school. In the department, nearly 60 percent of our undergraduates go on to graduate study in chemistry or medical school. Research is thus a significant part of our students' lives.

The department is fortunate to have a strong research base, faculty and staff who are interested in personal instruction, and a variety of courses that lead to or encourage undergraduate research participation. With a research budget of approximately $10M provided by grants from governmental, foundation, and industrial sources, there is ample financial support for most groups to incorporate one or two undergraduates into their research endeavor. The faculty and senior research group members have a strong incentive to do so, since not only do our undergraduates help push forward the research frontiers, but they are fun to teach! There is no greater gratification than to incite enthusiasm, particularly in those at the beginning of their careers. Finally, our undergraduate laboratory sequence provides outstanding experimental training, and students get a solid theoretical underpinning for their research in our regular lecture courses. An invitation to participate in the honors program in their senior year provides for many of our majors a forum for sharing the thrill of discovery with their colleagues.

Professor Melissa Hines and junior chemistry major Dante Cerza demonstrate a kinetics experiment to a budding scientist.

Of course, the thrill of discovery doesn't begin in an undergraduate research course—we need to capture students' imaginations long before they reach that level. In a modest way, chemistry at Cornell also contributes to inspiring younger minds. In collaboration with the Materials Science Center, the department hosted a workshop for high-school science teachers last fall. In demonstrations and lectures, we tried to bring these dedicated teachers up to date on exciting new developments in materials chemistry. We also participated in Chemistry Week with a full range of exhibitions at the local shopping mall. Younger students are also the focus of much of our volunteer efforts at Ithaca's community-built Sciencenter

I am pleased that my first six months as chairman of the department have seen our programs continue to excel in bringing the thrill of research to our undergraduates. Indeed, in this area as well as in others, I am fortunate to have inherited a department that performs at an outstanding level. For this legacy I owe a great deal of thanks to the faculty and staff, and particularly to our former chairman, Bruce Ganem. The department continues to prosper, but many activities in addition to the undergraduate research program will require our continued close attention in the future. In a series of faculty meetings this fall, we identified several areas for growth and change. Indeed, we have already embarked on a hiring program that seeks to bring eight new faculty members to the department in the next five years. I hope to report our initial successes in this endeavor in my next column.

Undergraduate Research: A perspective by Frank DiSalvo

Kevin Turneau

Joanna Ossinger and Kevin Turneau are undergraduates with "Discovery Fever." For a year or more they have worked alongside graduate students and postdocs in the DiSalvo group trying to invent new materials, compounds never synthesized or studied by anyone else. As they succeed, they become the first people on the planet ever to create this particular combination and arrangement of elements. Being truly first is an incredible rush. But it is the result of many hours of learning, of false starts, of repairing or redesigning apparatus, of making mistakes, of repeating measurements, of thinking through alternatives, of discussion with colleagues, of discipline and sacrifice, and even of doubt.

The undergraduate research experience is for many of our majors the first taste of the real scientific life at the forefront. It is so different from classroom learning. In typical course work, concepts and ideas (laws, theories, precepts, etc.) developed over perhaps a century or more are passed on. But, except for an occasional glimpse, the real struggle that fashioned and refined these ideas is unseen by students in the classroom. Coaxing secrets from the natural world is often a messy and nonlinear business; small steps are hard won. Contesting ideas and personalities clash. Other concerns and daily pressures intrude. Confusion and uncertainty, as well as stubborn optimism, are part of the process. All unlike the apparently logical and step-by-step development that typifies course work in the sciences.

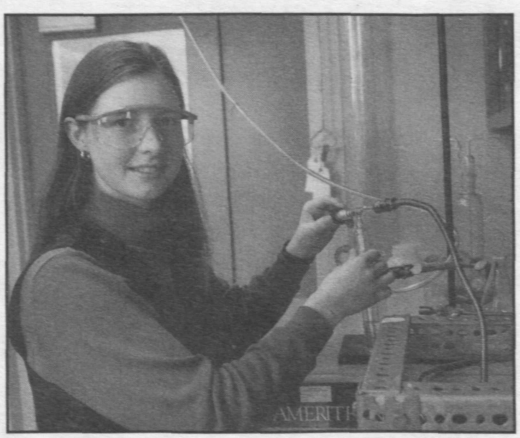
"What about laboratory courses?" you ask. "Don't they teach about research?" Well, no. They do help make abstract concepts real. They do teach techniques. These are important. The student begins to see that the theories almost always spring from a need to understand observations and experiments and that one experiment begets another. Further, the student learns that technique matters, that equipment malfunctions or breaks, and that persistence pays off.

What about Kevin and Joanna? Kevin is a senior who has worked in the DiSalvo group for more than a year, including this past summer. He has synthesized a molybdenu- based metal cluster using a new procedure that he helped develop. The cluster is hexameric: Mo_6S_8 (4-tert-butylpyridine)$_6$ and this is the first time it was prepared. Kevin is really involved in the project. He is in on nights or weekends, delayed going home for the holidays, and came back early—all to see what he can make next. Kevin has his heart set on going to medical school.

Joanna is a junior who has alsoworked in the group for more than a year, including last summer. She is trying to prepare new ternary nitride compounds using high-temperature techniques. It is clear that she sees some new phases in powder x-ray diffraction, but they have not yet been prepared in sufficient purity to be nailed down. She is working hard to do so. Joanna is heavily involved with the Chem Club and with Alpha Chi Sigma, the chemistry fraternity. She plans to go on to graduate school in chemistry.

Kevin and Joanna's stories are repeated throughout the department many times every year. In the 1996–97 academic year, 39 of the 61 majors in their senior year performed laboratory research with department faculty members and received academic credit. Another nine were doing research for pay (at five or six dollars an hour!). Some of our majors were doing research in other departments in topics such as biochemistry or nutrition. It is the chance to be a participant in the excitement of forefront research that makes our department, and indeed many departments at Cornell, an exciting place for undergraduates to be.

However, we continue to invent ways to improve or expand this rewarding experience for both the students and the faculty. President Rawlings has announced a special program to involve top undergraduate students in research for all four years. This Presidential Scholar Program will provide extra income for the students and of course put them at the forefront from their first days on campus. The department is also joining forces with the biochemistry department to seek foundation funding. If successful, we can further increase undergraduate participation as well as increase the stipends for research, especially in the summer when students can work full time.



Joanna Ossinger

Chemical helps ants remember where they left their food, shows promise for Alzheimer's disease; Cornell scientists report excited ants follow pheromone trail of same chemical they will use to paralyze their prey

Roger Segelken, Cornell News Service

ITHACA, N.Y. — The pheromone trail laid down by an *Aphaenogaster rudis* ant to help the ant and its recruited nest mates find their way back to prey they plan to kill — contains a chemical now undergoing clinical trials as a possible Alzheimer's disease treatment, Cornell University chemists report in the January 1998 issue of the German journal *Naturwissenschaften.*

Anabaseine, whose chemical analog GTS-21 stimulates the nicotine receptor sites in the brains of Alzheimer's patients and helps reduce memory loss, is one of four components found by Cornell researchers in secretions from the poison glands of *A. rudis* ants, a common species in the Northeast United States.

"However, this doesn't mean we should grow ants to treat Alzheimer's patients," said Athula B. Attygalle, senior research associate in the Cornell Institute for Research in Chemical Ecology (CIRCE) laboratory of Professor Jerrold Meinwald as well as director of the Mass Spectrometry Facility in Cornell's Department of Chemistry. "Synthetic versions of anabaseine can be made much more easily for medicinal purposes. We're interested in these neurotoxins because they're found in 'lower' animals, such as marine worms and ants, and even plants, and they seem to have an effect on the human brain."

Friedrich Kern, a visiting scientist in chemistry who observed *A. rudis* ant behavior in the laboratory as well as in wooded areas near Ithaca, described how one chemical cocktail serves several purposes for the ants: "This tiny ant needs help subduing prey that can be 10 to 15 times its size, so the ant returns to the nest and tries to recruit some nest mates," Kern explained. "The ant marks the route by dragging its sting along the ground like an ink pen and leaves traces of this four-part chemical cocktail from its poison gland.

"The chemical is a recruitment pheromone," Kern continued, "and when ants sense the pheromone, they become excited enough to follow the trail back to the prey—perhaps a worm or grub or an adult insect of some kind. Then they attack the prey with their stings, inject a neurotoxin that paralyzes muscles and drag the prey back to the nest."

Gas chromatographic and mass spectrometric analyses in the Cornell laboratory identified four components in the multipurpose fluid from the ants' poison glands. They are N-isopentyl-2-phenylethylamine, a key compound never before identified from nature; anabaseine (3,4,5,6-tetrahydro-2,3'-bipyridine); anabasine [3-(2-piperidinyl)pyridine]; and a fourth chemical never before found in ants, 2,3'-bipyridyl.

Further studies with the ants showed that the four chemicals together act synergistically, and that individual chemicals do not induce the same behavioral response. Describing a laboratory experiment with ants following a trail of the four-part cocktail that diverged into four trails of individual components, the chemists reported in *Naturwissenschaften.* "They searched around, but not a single ant was able to proceed and follow any of the continuation trails."

"As we continue to investigate the roles of chemicals in the lives of various species, we find certain compounds turning up in very different organisms," Attygalle said. "Here we have pyridine-based alkaloids that appear in tobacco leaves, in marine worms as defensive compounds and in ants to help them obtain food."

On the Pheromone Trail Chemical Communication Among Ants

Source: Athula Attygalle, Ph.D., Mass Spectrometry Facility, Cornell Department of Chemistry

— MORE THAN SEX: In the animal world, the chemical-based signals called pheromones do more than attract the opposite sex. Alarm pheromones, which are released when one aphid is crushed, send nearby aphids fleeing for their lives. Territorial marking pheromones, left behind when a cat rubs its cheek on a human's leg, tell other cats to whom the human belongs. Likewise, dogs don't really have to urinate every few yards along their morning walk; they, too, are leaving a chemical calling card to mark a territory. Kin-recognition pheromones tell insects who's family and who's not, even within the same species, and non-kin trying to enter a nest without the appropriate pheromone are fought off or killed. Recruitment pheromones, such as those produced by the *Aphaenogaster rudis* ants, rally nest mates to follow a pheromone-scented trail to a source of food; by the time the ants reach the prey item, they are excited enough to attack with venom that contains the pheromone they were following.

— ZIGZAG PATH: The pheromone trail left by an ant, such as the *A. rudis,* is not the shortest distance between two points to begin with, and ants following the trail appear to zigzag along the way. That is because the pheromone receptors in the tips of their two antennae orient them to the source of the pheromone and direct them to turn left or right. When they veer off the trail to the right, the right-hand antennae—receiving a weaker signal—tell them to turn left. And if they

continued on page 4

Ants (continued)

overcompensate and zag too far to the left, the left-hand antennae make them steer to the right. An ant with only one antenna will only zig (or zag). And if ants' antennae become crossed, they are hopelessly disoriented.

— EVOLUTION OF THE CHARISMA CHEMICAL: Not every ant species can draw a crowd with chemically sophisticated recruitment pheromones. The Myrmicine ants studied by Cornell researchers sometimes recruited seven or eight helpers. But army ants, generally regarded as being more advanced in an evolutionary sense, can summon thousands of compatriots with a single chemical signal. And more primitive ants, lacking a recruitment pheromone, leave no detectable trail. Setting off on a mission, a primitive ant practices tandem running—that is, if it can persuade one other ant to come along.

— SENSITIVE SENSORS: Pheromone receptors and the biological signaling apparatus that go with them are as sensitive as the finest analytical-chemistry instruments. Cornell researchers test this super-sensing ability by measuring the electrical current passing through an ant's antenna as different chemicals, separated from a complex mixture by a gas chromatograph, are presented to the receptor at the tip of the antenna. Invariably, the antennae transmit signals only when the appropriate pheromone (or another important chemical for the ant) is detected. Ants can detect just a few parts of their pheromone in a billion parts of air. And when the electrical signal passes through their antennae, only 0.1- to 2-millivolt potential differences are created. No wonder their batteries never seem to run down.

Wild tomatoes yield formula for nontoxic insect repellent, Cornell researchers say; U.S. patent granted to 'Non-cyclic Esters for Pest Control'

Roger Segelken, Cornell News Service

ITHACA, N.Y. — Scratching the surface of wild tomatoes that bugs don't bother, Cornell University scientists discovered the plants' chemical secret for repelling insect pests: a complex, waxy substance that commercially grown tomatoes have "forgotten" how to make.

A simplified formulation of the wild tomatoes' chemical has been granted a U.S. patent on "Non-cyclic Esters for Pest Control" and could become the next-generation nontoxic insect repellent for a long list of crops on hungry bugs' menu.

The newly patented compounds may work, in part, because they create sticky surfaces that insects don't like, and also because the compounds break down to release short-chain fatty acids, which are known to repel insects.

"We've made smaller versions of natural fats that are easily biodegraded to fatty acids," said Bruce Ganem, a Cornell chemist and co-inventor, along with Martha A. Mutschler, professor of plant breeding. "These are similar in structure to the natural triglycerides in our bodies, only with shorter fatty acids, and the amounts that will be on crops seem unlikely to pose a health hazard to humans." Ganem is the Franz and Elisabeth Roessler Professor of Chemistry in Cornell's College of Arts and Sciences.

Two insect larval pests, the tomato fruitworm ("*Helicoverpa zea*") and the beet army worm ("*Spodoptera exigua*"), cause an estimated $30 million a year in damage to the processing-tomato crop in California. The grubs bore holes in tomato fruits, allowing decay organisms to enter the skin and spoil the fruit. But when the Cornell pest-control chemical is sprayed on tomatoes, damage from tomato fruitworm and beet army worm is greatly reduced or eliminated altogether.

In addition to tomatoes, the patented chemical agents are expected to protect a wide range of crop plants and ornamental plants against more than 30 kinds of mites, beetles, leafminer flies and whiteflies, aphids, leafhoppers, mealy bugs, worms and thrips, the Cornell inventors said. And the same insect species that are repelled from eating the plants also are less likely to oviposit (lay eggs), thus breaking a cycle of plant destruction, the scientists added.

The Cornell scientists began their discovery process by selecting wild tomatoes (*Lycopersicon pnennellii*, the relative of a commonly cultivated tomato, *L. esculentum*) with few insect blemishes, then washing the fruit to obtain the natural compounds for chemical analysis. The exact mixture of glucose esters and other compounds would have been too complicated to duplicate, Ganem said, so they narrowed their formulation to some simple analogs with common structural and physical properties.

"Now the chemistry is easy," Ganem said, noting that the patent covers several similar formulations of the pest repellent. The "non-cyclic" term means each compound's carbon atoms are arranged in chains, rather than in rings.

Mutschler and Ganem hope to take their invention to the next stage — a marketable product with all the emulsifiers and stabilizers that are expected by consumers — through a Technology Development Fund Grant from Cornell's Office of Economic Development.

Faculty News

Cornell Professor Roald Hoffmann named one of the top chemists in the past 75 years. A former Cornell chemistry department chair also is named to American Chemical Society list.

-Paul Cody, Cornell News Service

ITHACA, N.Y. — Cornell Professor Roald Hoffmann has been included among the top 75 chemists of the past 75 years in a special issue of *Chemical & Engineering News,* published January 12. The late Peter Joseph William Debye, Cornell chemistry department chair in the 1940s, also was named to the list.

Chemical & Engineering News is the weekly newsmagazine of the American Chemical Society, the world's largest scientific society, which is celebrating its 75th anniversary this year. The magazine is distributed to all 155,000 chemists and chemical engineers who are society members. The list of the "top 75 distinguished contributors to the chemical enterprise" was compiled based on voting by the magazine's readers.

Hoffmann is the Frank H. T. Rhodes Professor of Humane Letters and professor of chemistry. He won the Nobel Prize in chemistry in 1981 for work that helped establish qualitative molecular-orbital-based ways of thinking about the electronic and geometrical structure and reactivity of all molecules and for defining rules to predict the course of pericyclic reactions. He shared the prize with the late Kenichi Fukui.

Hoffmann also has been a recipient of the 1973 Arthur C. Cope Award of the American Chemical Society, the 1983 National Medal of Science, the 1986 National Academy of Sciences Award in the Chemical Sciences and the 1990 Priestly Medal. He has been awarded numerous honorary degrees, among them honorary doctor of science degrees from Columbia and Yale universities.

Hoffmann graduated from Columbia in 1958 and earned a Ph.D. in chemical physics from Harvard in 1962. He began teaching at Cornell in 1965.

He also is a poet with two published collections of poetry, *The Metamict State* in 1987 and *Gaps and Verges* in 1990, both from the University of Central Florida Press.

"Roald Hoffmann has taught the chemical community new and useful ways to look at the geometry and reactivity of molecules, from organic, through inorganic, to infinitely extended structures," said Professor Paul Houston, chair of Cornell's Department of Chemistry. "But as important, his teaching is not confined to the journals, nor even to the freshman introductory chemistry courses that he teaches each year. He has participated in the production of a television course about chemistry, and he has written popular and scholarly articles on science and other subjects, including three popular books and two collections of poetry. Roald is not merely one of the most important chemists in the past 75 years, he is one of the most important educators."

Peter J. W. Debye won the Nobel Prize in chemistry in 1936 for his contributions to the study of molecular structures through the investigation of dipole moments and diffraction of x-rays and electrons in gases. A Dutch citizen, Debye was director of the Max Planck Institute in Berlin, but was refused German citizenship and was forced to flee Nazi Germany. He came to Cornell in 1939 and was chair of the chemistry department from 1940 to 1950. He retired in 1952 and was an emeritus professor until his death in 1966.

Professor Hoffmann has also received the 1997 literature prize for the best science book of the year for *The Same and Not the Same.* The prize, given by the Verband der Chemischen Industrie (the German equivalent of the Chemical Manufacturers Association) was presented in October 1997 by German chancellor Helmut Kohl. The book, which has been translated into Korean, German, Spanish, and Chinese, has also received a Korean prize as one of the best science books of the year.

Horace White Professor of Chemistry **Jon C. Clardy** presented the August-Wilhelm-von-Hofmann-Lectures in December 1997. These lectures, created in 1977 by Gesellschaft Deutscher Chemiker, serve the memory of August Wilhelm von Hofmann, who made outstanding contributions to organic, inorganic, and physical chemistry as well as technology. The lectures, entitled *Natural Products and Their Macromolecular Receptors,* were presented at three universities in Germany, Tübingen, Hannover, and Frankfurt.

Geoffrey W. Coates, who joined the Chemistry Faculty in July 1997, has been awarded a Camille and Henry Dreyfus New Faculty Award for 1997. The award, designed to provide external research support to new faculty no later than the beginning of their first full-time academic appointments, is presented to outstanding scientists to realize their promise as educators.

The American Institute of Chemists Board of Directors and the National Meeting Committee has chosen Professor **Jerrold Meinwald** as one of four recipients of the 1997 Chemical Pioneer Winners. This prestigious award, which started in 1966, recognizes chemists, chemical engineers, or their associates who have made outstanding contributions that have had a major impact on advances in chemical science and industry and/or the chemical profession. Professor Meinwald received his award at an awards banquet held on Friday, September 5, at the Crowne Plaza Hotel in Las Vegas, Nevada, and gave an oral presentation at the Chemical Pioneer Symposium held on September 6.

At the April 1997 meeting of the American Chemical Society, George W. and Grace L. Todd Emeritus Professor of Chemistry **Harold A. Scheraga** received the ACS IBM Award for Computers in Chemical and Pharmaceutical Research.

Benjamin Widom, Goldwin Smith Professor of Chemistry, is to be awarded (jointly with Professor Elliott Lieb of the Mathematics and Physics Departments of Princeton University) the 1998 Boltzmann Medal. The award, instituted by the IUPAP Commission on Statistical Physics to honor outstanding achievements in that field, will be presented by the Commission at the International Conference on Statistical Physics in Paris in July 1998. Professor Widom will then receive a gold medal and present a lecture at the award ceremony.

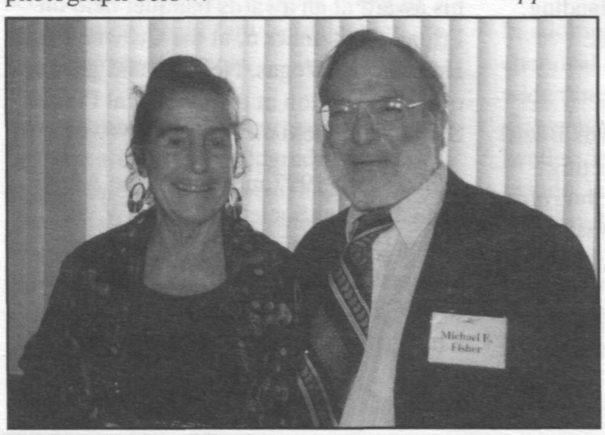
Department News

Fall 1997 Baker Lectures

Our fall 1997 Baker Lecturer was Michael E. Fisher, Distinguished University Professor and Regents Professor of the University of Maryland. Professor Fisher was a member of our own Cornell Chemistry faculty for twenty-one years before leaving for Maryland in 1987.

Professor Fisher gave a brilliant and enthusiastically received series of lectures under the general title, *The Challenge of Coulombic Criticality: Debye-Hückel, Bjerrum, and Beyond.* He attracted an audience not only from Chemistry but also from Physics, Materials Science, Chemical Engineering, and other allied fields. He introduced us in his lectures to the basic ideas in the theory of the liquid state and of phase transitions and critical phenomena (which are now all well established principles, many of which Professor Fisher was himself responsible for developing). He then told us of the paradoxes and uncertainties one faces in trying to apply these theoretical ideas to the interpretation of experiments on concentrated electrolyte solutions, where many open questions remain. We are all grateful to Professor Fisher for an exciting lecture series.

The department held a reception in Professor Fisher's honor on September 21. He and his wife Sorrel are featured in the photograph below.



Materials Science Workshop

On October 18, 1997, the Chemistry Department played host to sixteen high school and four college chemistry teachers, who were here to participate in a Materials Science Workshop sponsored by the Cornell Materials Science Center. Faculty, staff, graduate, and undergraduate students from Chemistry, Chemical Engineering, Textiles and Apparel, and Materials Science and Engineering spent the day showing the teachers how to conduct experiments and demonstrations that illustrate properties of polymers and other solid-state materials. Members of the Chemistry Department included Professors Frank DiSalvo and Robert Fay; staff members Stan Marcus, Harriet Smithline, and Rebecca Regan; graduate students Lori Lepak, Matt Gronquist, Fred Huntley, and Kevin Proctor; and undergraduate student Joanna Ossinger. This was the second such workshop; the first was given in 1995.

Spring 1998 Roessler Lectures

The Franz and Elisabeth Roessler Lectures were delivered by **Manfred Reetz** of the Max-Planck-Institut für Kohlenforschung, Germany, on March 30 and 31, 1998. Professor Reetz gave his first lecture, *Darwinistic Principles in the Development of Enantioselective Biocatalysts for Organic Synthesis,* at 4:40 P.M. and his second, *Size-Selective Fabrication of Transition Metal Clusters and Their Applications,* at 11:15 A.M. Lectures took place in 119 Baker Laboratory. The Roessler series is named in honor of an endowment by the family of Franz Roessler, a German chemist who emigrated to the United States in 1882 to found the Roessler and Hasslacher Chemical Company. The company became part of Dupont in 1930. Roessler's son, Hans, was a student in Cornell's Department of Chemistry in the early years of the century. Roessler family endowments support a named professorship in the Department of Chemistry as well as lecture visits by prominent German chemists.

Spring 1998 Debye Lectures

Maurice Brookhart, Professor at the University of North Carolina at Chapel Hill, will deliver the Spring 1998 Debye Lectures in April. The first two lectures are both entitled *Mechanistic and Synthetic Studies of Olefin Homo- and Copolymerizations Using Well-Defined Ni(II) and Pd(II) Complexes*,and will be given on Monday, April 20, at 4:40 P.M. and Tuesday, April 21, at 11:15 A.M. The third lecture, 3:00P.M. in 119 Baker , will be titled *Catalytic Chemistry Based on C-H Bond Activations Using Cp*M(L) (M=Co, Rh) Species.* The lectures, taking place in 119 Baker Laboratory, are sponsored by the Cornell section of the American Chemical Society.

Spring 1998 Blomquist Lectures

The Alfred T. Blomquist lectures series are named after Blomquist, who arrived at Cornell in 1932 as a National Research Council postdoctoral fellow, subsequently serving as a professor of organic chemistry. Blomquist established an international profile for his work in the behavior of small-ring molecules, the chemistry of many-membered rings, and the synthesis of novel monomers and polymers. The series, funded by Professor Blomquist's family, former students, and co-workers, brings to the department **Samuel J. Danishefsky** of Columbia University, who will give lectures entitled *On the Chemistry-Biology Interface: From Glycals to Clinically*

Evaluatable Carbohydrate-Based Antitumor Vaccines, on Monday, April 27 at 4:40 P.M. and *From Fantasy to Reality: A Travelog in the Fascinating World of Total Synthesis,* Tuesday, April 28 at 11:15 A.M. in Room 119 Baker Laboratory.

Spring 1998 Aggarwal Lectures

This series of lectures, inaugurated in 1995, is funded by the late Sundar L. Aggarwal PhD '49. Dr. Aggarwal, who retired as vice president and director of GenCorp research division in 1988, was an industry consultant who received industry awards and published articles on and received patents for synthetic rubbers, block polymers, and composites. He was a fellow of the Institute of Materials Science and a member of the American Chemical Society, the Directors of Industrial Research, and the Industrial Research Institute.

Rolf Mülhaupt of the Institut für Makromolekulare Chemie, Albert-Ludwigs-Universität Freiburg, will give the Spring 1998 lectures on Tuesday, Wednesday and Thursday, May 19. 20., and 21. The lectures are entitled, respectively, *New Routes to Engineering Polymers: Supramolecular Assemblies; New Routes to Engineering Polymers: Nanostructures and Hybrid Materials; Tailor-made Polyolefins and New Polymer Architectures via Catalytic Polymerization.* The lectures on Tuesday and Wednesday are given in conjuction with the Polymer Outreach Program, taking place at 9:00 A.M. on the 19th, and 1:30 P.M. on the 20th in Room 700 Clark Hall. The final lecture, on the 21st, will be given at 2:00 P.M. in 119 Baker.

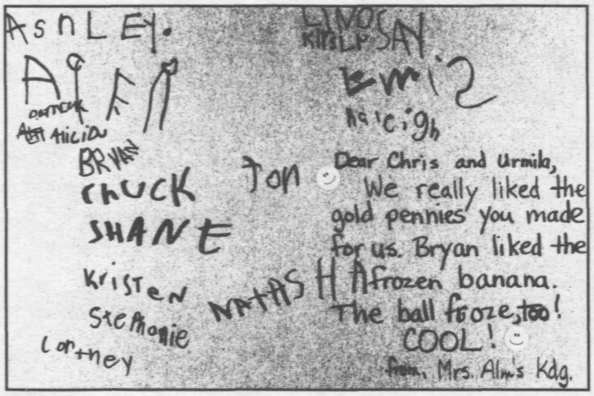
McGuire Acting Director of Center for Learning and Teaching

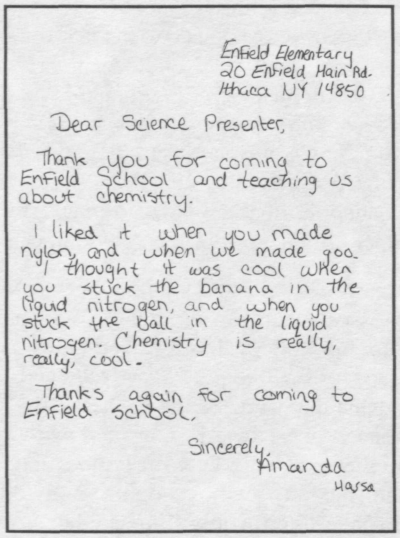
Saundra Y. McGuire has been appointed acting director of the Cornell University Center for Learning and Teaching (a new center created by the merger of the Learning Skills Center (LSC) and the Office of Instructional Support).

Dr. McGuire was the associate director of the LSC and is a senior lecturer in the Chemistry Department, where she received the 1991 Clark Distinguished Teaching Award.

Chemistry Department Participates in Local Elementary School Science Fair

Christopher Bender, Cornell Chemistry





Enfield Elementary
20 Enfield Main Rd.
Ithaca NY 14850

Dear Science Presenter,

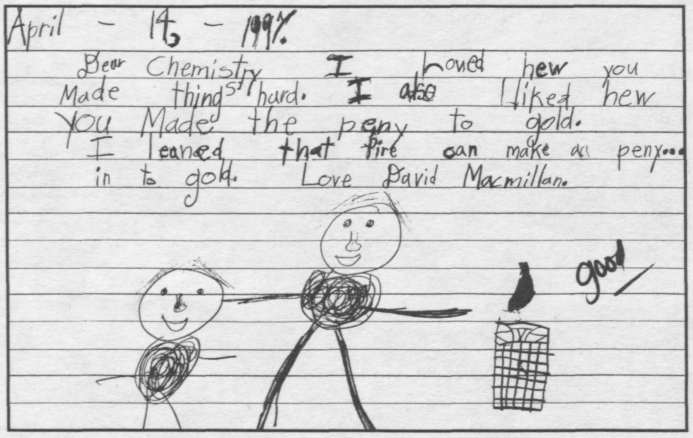
Thank you for coming to Enfield School and teaching us about chemistry.

I liked it when you made nylon, and when we made goo. I thought it was cool when you stuck the banana in the liquid nitrogen, and when you stuck the ball in the liquid nitrogen. Chemistry is really, really, cool.

Thanks again for coming to Enfield School.

Sincerely,
Amanda
Hassa

On April 11, 1997, a group of graduate and undergraduate chemistry majors from the department headed over to participate in Enfield Elementary School's Science/ Math Fair. Due to an abundance of volunteers, there were enough people to staff *three* classrooms for showcasing chemistry to students from kindergarten to fifth grade. Besides the ever popular standbys such as making slime and "cool" demos with liquid nitrogen, we also excited students and teachers alike with disappearing Styrofoam peanuts, oscillating clock reactions, "gold"-plated pennies, production of nylon rope, quick-acting superabsorbant polymers, and a chemiluminescent light show. The fair elicited an enthusiastic response and a bevy of questions from the audience of youngsters who seemed to like chemistry quite a bit, especially when they realized that chocolate chip cookies were made of chemicals. Both the participants and the audience had "Fun with Chemistry," the title and theme of the demonstrations. Demonstrators were Urmila Deo, Pam Arnold, Laurie Hill, Randy Claussen, Chris Bender, Chuck Brandenburg, Marc Weimer, and Oren Scherman.



News from Alumni and Friends

Alfred W. Bennett, AB '33, writes that while he cannot report to us on his PhD activities, he can keep us up to date on others. He celebrated his 85th birthday (September 8) this year in Budapest. The following day he went to a horse show where he volunteered to ride a horse bareback (no saddle or stirrups!) and was happy to report he did so without falling off! "At my age, being alive and well at 85 is an achievement that ranks above any scholastic endeavor, past or present. I hope to make it into the 21st century and will keep you posted on my progress. Good luck to all Cornellians."

Lincoln I. Diuguid, MS '39, PhD '45, is still active, operating Du-Good Chemical Laboratory and Manufacturers in St. Louis, Missouri for 50 years (conducting cancer research, consulting, and product development). On October 31, 1997, he presented a paper "Potential AntiCancer/HIV Derivatives of Benzothiazole, Pyridine, Piperazine and Santonic Acid," at the American Chemical Society Midwest Meeting at Tan-Tar-A, Osage Beach, Missouri. His picture (Inventor and Outstanding Scientist in St. Louis) is in the St. Louis Science Center.

The State Microscopical Society of Illinois has awarded the first 1997 Emile Chamot award to **Ted G. Rochow,** AB '29, PhD '34, honoring him as a microscopist who has made outstanding contributions to the field of microscopy and microanalysis. The award was announced at the SMSI Annual Awards Dinner Banquet on July 23, 1997, in Chicago.

Zafra Lerman, postdoctoral associate with Professor Scheraga from '69–73, now at Columbia College, has received the ACS Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences. This award, sponsored by the Camille and Henry Dreyfus Foundation, was established in 1993 to recognize individuals who have significantly stimulated or fostered the interest of students, especially minority and/or economically disadvantaged students, in chemistry.

Frank Douglas, PhD '73, was recently promoted to the newly created post of head of drug innovation and approval at Hoechst Marion Roussel. After receiving his MD at Cornell Medical College and an internship at Johns Hopkins, Douglas spent three years at NIH, then joined the pharmaceuticals industry in 1984 as director of clinical biology at Ciba-Geigy, rising to director of U.S. research. In 1992, he joined Marion Merrell Dow as executive vice president of global research and development and a member of the board of directors.

Troy Wood, postdoctoral associate with Professor McLafferty '94–96, has recently joined the faculty at the State University of New York at Buffalo. His research focuses on the development of analytical mass spectrometry of biomolecules, correlation of enzyme structure and function, protein folding issues, and sequencing components in biological mixtures.

Isabelle A. Kagan, AB '91, writes that she is still in graduate school at Michigan State University and hopes to finish her PhD in plant pathology this year. Her project is on the biosynthesis of a plant compound (camalexin biosynthesis in Arabidopsis). Her chemistry background has been useful: "I do more liquid-liquid extractions and TLC's than I ever imagined I would do while taking Chem 301, and I'm constantly checking my Chem 359–360 text or loaning it to other people in the lab."

Meredith Joy Hodach, AB '97, writes that while at Cornell she received a Wood Scholarship for a one-year master's program at Imperial College in London that was offered through Cornell Abroad. The scholarship included full tuition and room expenses. She is currently enrolled in a course entitled Biochemical Research, which leads to the awarding of an MSc from the University of London and a Diploma from Imperial College. She says that the scholarship is a great deal for anyone who wants to go on to graduate school, or even someone who wants to get a job but would like to have an MS in addition to a BA, and it is ideal for anyone who wants to study and live in London for a year. Meredith plans to go to medical school but wanted to take a year between Cornell and med school to do something different. Good luck, Meredith!

In Memoriam

Robert G. Kooser (PhD, '68), the Philip Sidney Post Professor of Chemistry at Knox College died at age 56 on January 14, 1998, a few weeks after suffering a stroke. Bob joined the faculty at Knox in Galesburg, Illinois, the same year he completed his PhD degree at Cornell as one of the first graduate students of Jack Freed. He had also received a DuPont Teaching Award from this department. I was an undergraduate student at Knox during 1969–73 and had the good fortune to take several chemistry classes from Bob in his early professorial years. Particularly in his physical chemistry classes, I was continuously fascinated by his lucid lectures that conveyed both rigor and enjoyment. It is probably true that I remained a chemistry major at Knox and that I came to Cornell for my graduate studies in significant part because of him.

Bob received many honors during his 30 years on the Knox College faculty, including the Philip Green Wright Award for Teaching Excellence, the Sears Award in Teaching and Campus Leadership, the Burlington Northern Faculty Achievement Award, and the Philip Sydney Post Professorship—one of the highest distinctions that a Knox faculty member can receive. He was nationally recognized for his scholarship and his leadership in undergraduate chemistry education.

Although deeply saddened by his early death, his students and colleagues will remember Bob for his liveliness and for his inspiration.

- Barbara Baird

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