Cornell Chemistry

November 1995 Number 64

The Chairman's Notebook

Science on the Silver Screen

One Friday morning last May at the American Society for Mass Spectrometry's annual meeting in Atlanta, nearly 900 scientists dragged themselves out of bed for a plenary lecture at 8:15 a.m. Miles O'Brien, the keynote speaker, is the Cable News Network's lone science correspondent. Like many journalists who cover technological stories, O'Brien has no formal training in either mathematics or science. Once he discovered the secret to a successful story, however, those very news opportunities other reporters long ago eschewed quickly became his full-time job at CNN.

His lecture was entitled "The Geek Factor: Why Network Television Doesn't Cover Science." When conference organizers marveled at the extraordinary turnout, O'Brien wryly observed that if you call scientists by a derogatory name they will always show up to find out why. Apparently it goes with being an experimentalist.

He explained that three ingredients are required to create a good science piece for television. First, as he put it, "It must appeal to Joe Six Pack." Basic science or curiosity-driven research simply doesn't connect with the wider audience of nonscientists. The environment makes natural story material, as does disaster-based science such as seismology or the chemistry of high explosives, as the World Trade Center and Oklahoma City bombings demonstrate. Even good technology stories, it seems, must contain some inherent entertainment value. Second, high-quality color pictures or appealing visual images hold the audience's attention. O'Brien pointed out that efforts to cover scientific stories using uninteresting graphics or stock footage from a station's video files usually fail. Finally, a successful story needs an exciting, if not passionate, scientific spokesperson at its core. A determined environmentalist or an adventurous scientific explorer makes a great subject. No nerds or geeks need apply, thank you.

No wonder networks don't report much about science. One member of the audience that day in Atlanta, objecting to O'Brien's characterization of the average "Joe Six Pack" viewer, suggested that CNN might have seriously underestimated its audience. Not so, O'Brien roared back. Whether they prefer cabernet, chardonnay, Chivas, or Coors, viewers want to see scientific stories on television with a clear, colorful message.

If television is the principal medium by which Americans get their scientific background on complex public policy debates, O'Brien's discouraging analysis indicates how badly scientists have failed in getting their message across clearly. We who teach and do research at Cornell and other American research universities share doubly in this lapse. We have neglected, first of all, to educate our nonscientist students in the method and practice of science, preferring instead to design our courses for younger clones of ourselves. Second, we have for too long opted out of presenting and explaining what we do in our scientific research and why those research projects are important.

The CNN reporter also chided his audience for failing to communicate with ordinary people. At Cornell, for example, we ask our university news service and public affairs personnel to interview scientists and report on their activities—ironically, to stand in for busy scientists and explain to the public what scientists can explain best of all. Scientists thus forfeit their opportunity to galvanize the public with the excitement and passion only a top researcher or great teacher can convey.

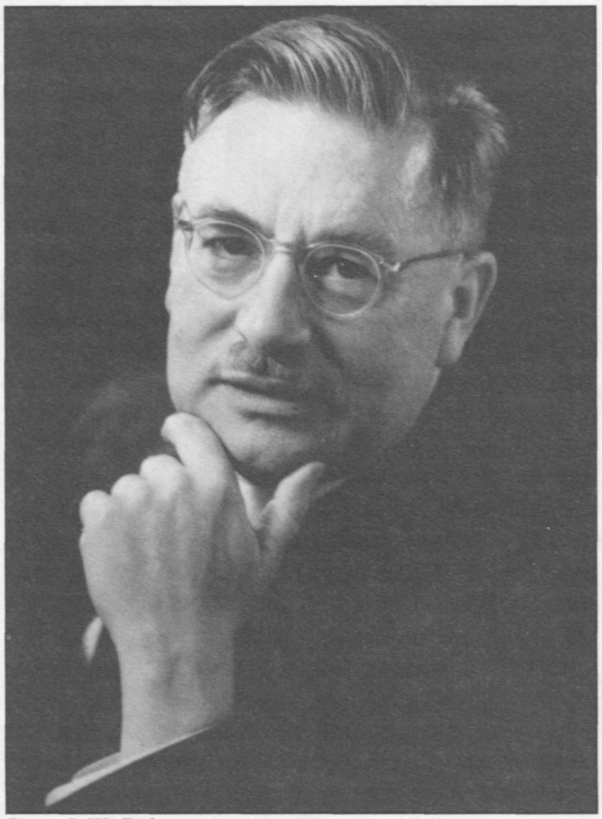
O'Brien's lecture in Atlanta was full of surprises. He showed videotapes of technology stories recently covered by CNN, some probing the underlying issues in depth over several minutes, which seemed remarkably long. When asked where CNN science stories come from, he explained that he meets scientists wherever he travels and gets ideas directly from the people and projects he encounters.

So ask a reporter to lunch. Better yet, invite one to speak at your next conference. Introduce your guest to some colleagues and let them talk about chemistry for a while. Now more than ever, with the media and other opinion makers shaping debate on science and public policy, it may very well be both your professional and civic duty to do so.

—Bruce Ganem

This issue of *Cornell Chemistry* introduces our new masthead, a drawing of the south entrance of Baker Lab. The plaza and south entrance are familiar to every Cornell chemist, having years past supplanted the larger front entrance as Baker's "main" doorway. The artist is Milly Acharya, an Ithaca resident who works as a cataloger in the John M. Olin Graduate Library at Cornell. She has written and illustrated a youth's version of an Indian epic, which will be published in New Delhi.

Department News



Peter J. W. Debye

ANONYMOUS DONORS FUND DEBYE PROFESSORSHIP

by Jeanette Knapp for *Communiqué*

The fortunes of war brought Nobel laureate Peter J. W. Debye, one of the world's most distinguished chemists, to Cornell. More than 50 years after that arrival, a group of anonymous donors has given more than $1 million toward a professorship in his honor. Peter Joseph William Debye (1884–1966) was a theoretical physical chemist from Maastricht, Holland. He was awarded the 1936 Nobel Prize in chemistry for his contributions to the study of molecular structures through investigation of dipole moments and the diffraction of x-rays and electrons in gases. The same year he became director of the Max Planck Institute in Berlin, where advanced research facilities were built for him.

He traveled to Cornell to deliver the 1939 Baker lectures, but when Hitler invaded Holland, Debye refused to take up German citizenship and was declared an enemy alien. The Nazis immediately confiscated his laboratory and new home in Berlin. Debye accepted Cornell's offer of the chairmanship of the Department of Chemistry in 1940, and his family joined him in Ithaca. His son Peter Debye PhD '44, and his grandsons Norwig '65 and Nordulf PhD '70, eventually became Cornell graduates.
The late Albert Laubengayer remembered his colleague as an "understanding and effective chairman, very good at stripping aside red tape and getting to the core of a problem." That was the essence of his scientific genius. Professors Henri Sack and Benjamin Widom wrote, "He knew that physical phenomena must have simple explanations; he took complexity to be lack of understanding. To recognize the essentials, to express them clearly and pictorially, and then to pursue their consequences with superb technical facility was Debye's style."

Peter Debye was intrigued by practical problems, particularly problems in industrial chemistry. His theoretical grasp of mechanics, electrodynamics, thermodynamics, statistical mechanics, and quantum mechanics enabled him to demonstrate the artificiality of the boundary between physics and chemistry. And he is remembered as a superb teacher who used unforgettable illustrations and analogies to enliven his lectures. "Those who heard them," his colleagues remembered, "can no longer think of density fluctuations without seeing the tiny stick he asked us to imagine thrown into the medium to measure spatial correlations, and we cannot think of a dipole without seeing a cigar."

Generations of Debye's students at Cornell, among them the founders of the Debye fund, have by now achieved distinction in their own right in the field of chemistry. Students, colleagues, and admirers of Professor Debye are invited to make gifts to the Debye Professorship Fund in the Department of Chemistry to honor this remarkable scientist and teacher.

CORNELL CHEMISTRY RANKS AMONG NATION'S TOP GRADUATE PROGRAMS

The Cornell Chemistry Department was ranked sixth in the nation by the National Research Council of the National Academy of Sciences in its comprehensive evaluation of graduate faculty and programs. The four-year study, entitled "Research-Doctorate Programs in the United States," was released in mid-September and assesses the scholarly programs at 274 private and public institutions.

The survey, used both by prospective students and granting agencies, polled more than 8,000 faculty members on the overall caliber, educational effectiveness, and change in program quality over the previous five years. Criteria include the scholarly qualifications of the faculty, time to degree, and percentages of women and minorities in a program.

The University of California at Berkeley was ranked first in the nation, followed by the California Institute of Technology, Harvard and Stanford Universities, the Massachusetts Institute of Technology, and Cornell.

"This is great news," said Bruce Ganem, chairman of the Department of Chemistry. "Over the years the top rankings haven't changed very much," he explained. "We've always been considered one the best departments in the country, and it's gratifying that the latest poll reflects the progress we've made in our programs." The previous NRC/NAS survey, conducted in 1982, ranked Cornell's graduate chemistry program 11th overall.

Cornell University also ranked sixth in the strength of its entire graduate program. The Department of Materials Science and Engineering, a collaborator with the Department of Chemistry in the Materials Science Center, ranked third among material science programs in the nation and was the highest-ranked science program in the university.

ACS HONORS CORNELL CHEMISTS

Three members of the Department of Chemistry have been honored by the American Chemical Society with prestigious national awards for 1996. The awards were announced in the September 25 issue of *Chemical & Engineering News,* the official publication of the ACS.

Jean M. J. Fréchet received the ACS Award in Applied Polymer Science, sponsored by the Phillips Petroleum Co.

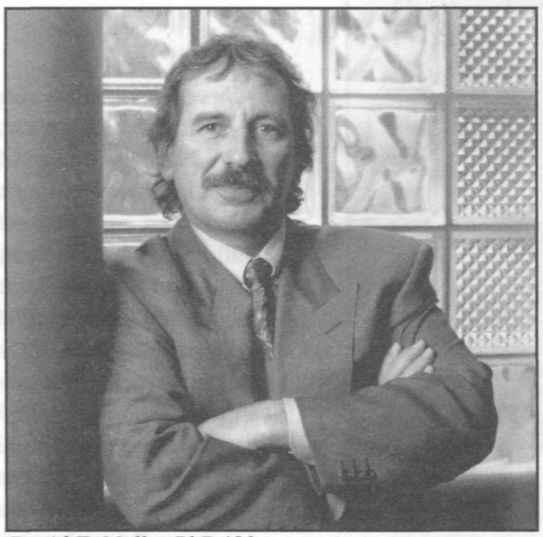
Bruce Ganem, Franz and Elisabeth Roessler Professor of Chemistry, received an Arthur C. Cope Scholar Award. The award consists of a certificate and a $25,000 unrestricted research grant. The recipient is required to present a lecture at the annual Arthur C. Cope Symposium held in Orlando, Florida, in August 1996.

Roald Hoffmann, John A. Newman Professor of Physical Science, received the George C. Pimentel Award in Chemical Education, sponsored by Union Carbide Corp.

Also David Pysnik, Sidney High School chemistry teacher, received the James Bryant Conant Award in High School Chemistry Teaching, sponsored by Albemarle Corp. Pysnik has collaborated with Cornell Chemistry in a summer educational experience.

Society of Cornell Chemists

Beginning with this issue of *Cornell Chemistry*, dues for the Society of Cornell Chemists increase to **$25.** As always, your dues are voluntary and help the Department of Chemistry offset rising costs for newsletter production, printing, and paper. In exchange, each new issue of *Cornell Chemistry* will bring you broader news coverage of the department, regular features about fellow alumni working in the field, and interesting updates on faculty research groups.



David F. Muller PhD '80

SUMMIT TECHNOLOGY

by Bruce Ganem

Ever since the light-focusing properties of glass were first discovered, humans have been grinding lenses to improve their vision. Now a pioneering discovery by a Cornell chemistry alumnus—a laser beam focused directly on the cornea—can alter the eye's natural refraction. Corneal sculpting by laser in an ophthalmologist's office may change the way human vision is corrected.

Summit Technology's argon fluoride excimer laser is the brainchild of David F. Muller PhD '80, who studied the properties of excimer lasers with Professor Paul L. Houston at Cornell. He co-founded the company in 1985 and now serves as Summit's president and chairman. Smitten with the possibilities of lasers at Cornell, Muller's love affair with high tech beams led to several jobs with laser manufacturers, among these two years spent as a product manager at Lambda Physik where, as he describes it, "Every time we developed some new laser system, the biomedical people came running with dozens of prospective applications. I already knew how to build the lasers, and I was getting tired of working for someone else." So Muller left Lambda Physik and, armed with an MBA from the Wharton School, founded ExciMed Technologies, eventually acquired by Summit. There he conceived the excimer laser system used for corneal sculpting.

Until recently, the only alternative to photorefractive keratectomy (PRK) beside lenses was a surgical technique called radial keratotomy—deep slits cut into the cornea to flatten and change its curvature. Excimer lasers work by electronically exciting a gas—in this case, argon fluoride—to an unstable state in which it emits photons of a particular wavelength. Highly energized ultraviolet light is released in a series of deep blue pulses, each lasting ten billionths of a second. The argon fluoride excimer laser produces extremely clean cuts in the cornea by breaking molecular bonds with negligible heating. Corneal tissue struck by this incredibly fine beam is removed with no thermal damage to adjacent areas. Besides reshaping the surface by removing clear tissue, the excimer laser can also excise opaque or scar tissue.

Over 20,000 patients (including Summit employees and members of the board of directors) have had refractive corrections by ophthalmologists in Europe and in Asia, where Summit's system is also in use. The instrument scans the patient's cornea and calculates an algorithm for the necessary focusing correction. In a span of ten seconds the laser shaves about 50 microns of tissue—half the thickness of a human hair. Corneal corrections normally stabilize after six to eight months, with 85–90 percent of the patients able to forego eyeglasses entirely.

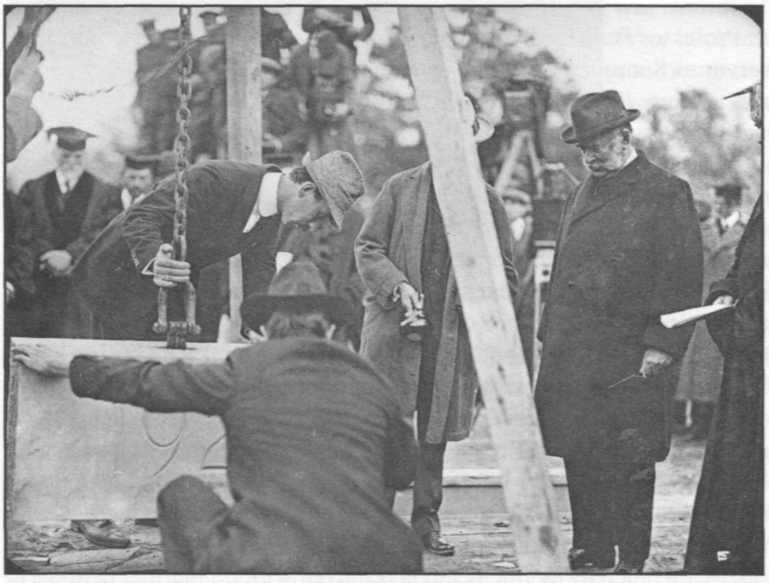
While photorefractive keratectomy is also being studied by the armed forces and the Pentagon, the procedure will more likely affect the activities of ordinary people. Lasse Swärd's daily routine was transformed after PRK, for which the young Stockholm newspaper editor is profoundly grateful. "When I'm jogging I don't have to stop every ten minutes to adjust my glasses or clean water from them when it's raining. On the whole, it's a great relief getting up in the morning without having to look for the glasses at the bedside table." *Editors note: The October 23 issue of the* Wall Street Journal *reports that Muller's Summit Technology laser system has received approval by the Food and Drug Administration. FDA approval, the* Journal *predicts, "ushers in a new era in eye care and what many investors expect will be a large and lucrative business." There are about 20 such laser vision-correction companies waiting in the wings for the FDA ruling.*

BAKER LAB: A THU

George F. Baker attended by lab designer Arthur N. Gibb '90 (left) and trustee Charles M. Schwab.

Over its three-quarters of a century Baker Lab has undergone more facelifts than an aging ingenue.

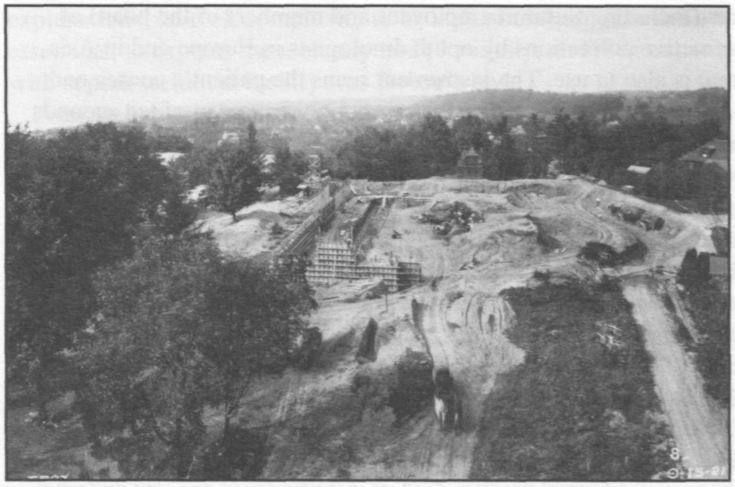
In 1919, three years after the Morse Hall labs burned and were roofed over for temporary use, President Jacob G. Schurman announced an anonymous gift of $1.5 million for a new chemistry building. From the start, Ithacan and Cornellian Arthur N. Gibb '90 collaborated with chemistry chairman Louis M. Dennis and his faculty to plan the largest, best-equipped lab in the nation, working out careful design relationships between laboratories and classrooms, selecting the latest equipment according to the stipulations of the gift. Frank Miles Day's architecture employed native Ithaca bluestone in the outer wall panels. What Professor Emil Chamot remembered in the 1930s of that late lamented chemistry hall held equally true for the impressive new one: "Architecturally it was consistent with Cornell tradition," Chamot quipped; "it was inconsistent with the other buildings on the campus." And so it goes.



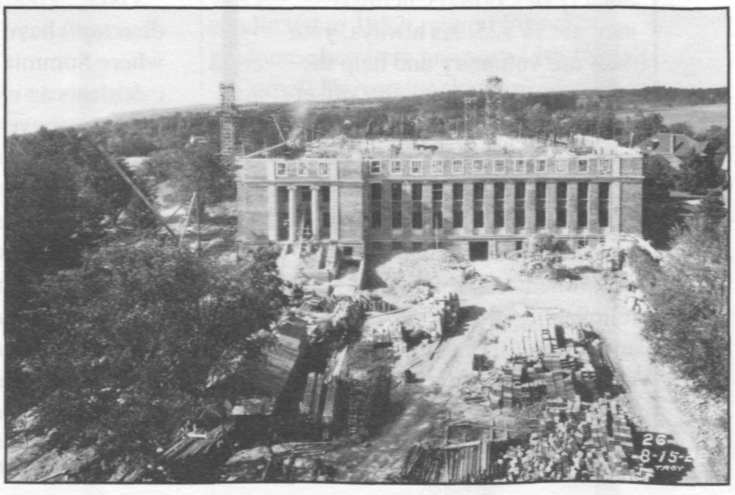
The cornerstone

Hoisted by chains on a contractor's tripod, the cornerstone was laid in all the pomp of President Livingston Farrand's inauguration ceremony under an October drizzle in 1921. At the dramatically opportune moment the anonymous benefactor was revealed to the audience—George F. Baker, a mutton-chopped New York banker in a somber topcoat and homburg standing at Farrand's right on the dais. Baker, summoned by popular acclaim to speak, was the exemplar of modest brevity—he uttered but a single sentence: "I am glad that my offering is welcome and I hope it will be useful."

When his building opened two years later on December 22, 1923, it was arguably the best chemistry facility in the world. It was duly dedicated and promptly invaded by chemists. They have been inside ever since. Every living Cornell chemist has haunted Baker's laboratories and classrooms in one of its incarnations.

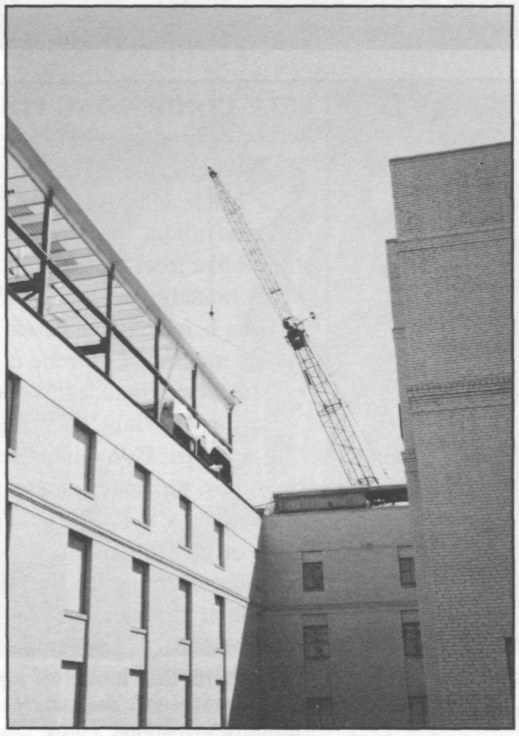


Building site, September 15, 1921



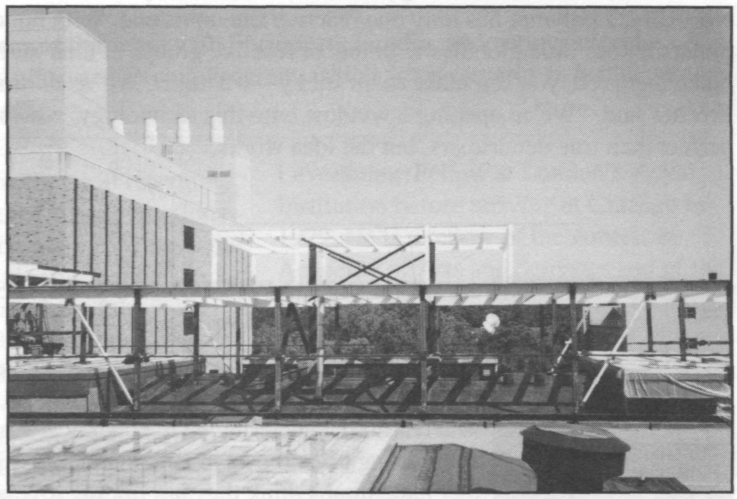
August 15, 1922

MBNAIL HISTORY



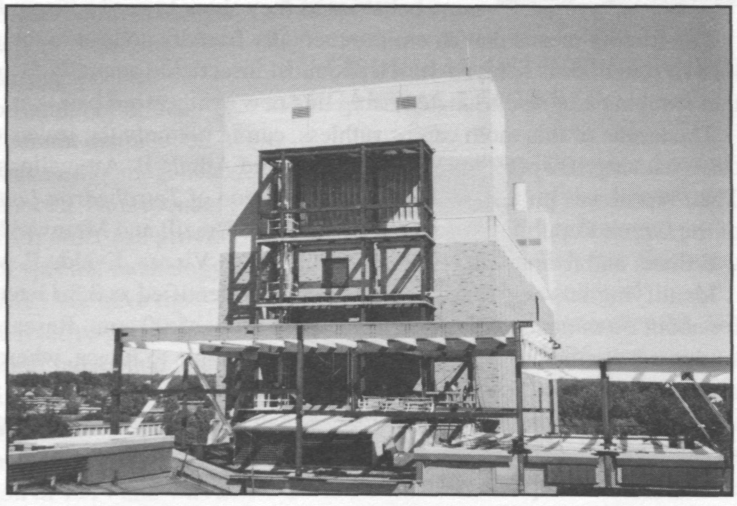
Original plans intended two additional wings to be added one after the other behind and parallel to the original structure, enclosing two more courtyards, rendering the completed building a closed square. By 1965 Clark Hall had intervened, so the "new wing" was erected on the other side of Baker in 1967. Now, thanks to George F. Baker and Spencer T. Olin '21, "Baker and Olin" is nearly one word. Major upgrades in the laboratories converted four long, barn-like teaching labs into 20 smaller "teaching modules" by 1970, around the same time that virtual miles of ductwork and room-sized air handling units in the attic space replaced the original ventilation. But Olin's high profile created a shadow of dead air behind Baker, and the building had been recirculating a good portion of its own exhaust for years.

The latest renovation of Baker Lab began in June 1995 and is expected to reach completion in 18 months at a cost of $10 million—about three times what it cost to build Olin Lab nearly 30 years ago. Enlarged air handlers and high-capacity exhaust fans will feed exhausts through new laboratory fume hoods—152 new hoods account for one-quarter of the entire renovation costs. Baker will be modestly crowned with a large exhaust plenum across its roof to feed exhausted fumes into a large manifold running up the outer wall of Olin and through eight stacks above the roof, where the wind will take them well above and beyond Baker's vacuous "dead zone." In the process asbestos is being removed from the older building, room air supply and exhaust systems are being upgraded, the electrical and fire protection systems are being improved, the fire standpipe system is being replaced, and the building is being made safer than it has ever been. Besides vastly increased functional efficiency, the upgraded systems will be 30 percent more energy efficient than the old air handling and electrical systems.

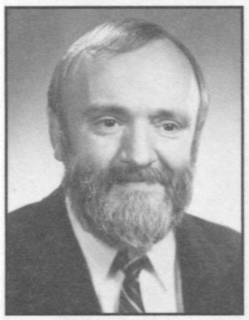


Keeping Baker Lab abreast of the times and of changing standards of efficiency and safety has been a labor of nearly 75 years. Cornell's chemistry community has continued to respond by earmarking their annual contributions to the department through the Cornell Fund.

December 31, 1922



Lab Notes



SELF-CONDENSING POLYMERIZATION HAS INDUSTRIAL APPLICATION

by Larry Bernard, Cornell News Service

Cornell University chemists have discovered a new technique for building dendritic polymers that make better adhesives, lubricants, and coatings for industrial uses. The technique, "self-condensing vinyl polymerization," represents a new approach to making polymers that behave like dendrimers—molecules shaped like trees that contain a core from which polymeric chains branch in all directions, forming large, highly branched, globular molecules. The Cornell group led by Professor Jean M. J. Fréchet made a vinyl polymer behave like a dendrimer—they made for the first time a hyperbranched polymer using a modified styrene monomer. Styrene is commonly used in Styrofoam and other materials.

The work, financed by the U. S. Office of Naval Research and the National Science Foundation through Cornell's Materials Science Center, was published in the August 25 issue of *Science*. Authors are Fréchet; Masahiro Hemmi, a visiting scientist; Ivan Gitsov, a research associate; Sadahito Aoshima, a visiting scientist from Tokyo; and Marc R. LeDuc and R. Bernard Grubbs, graduate students in Fréchet's laboratory.

Their accomplishment was no easy feat. The chemists had to "trick" the molecule into reacting with itself for the growth of successive branches from the original stem. They accomplished this by forming an ion on the modified part of the styrene monomer; this ion adds to another monomer forming the first branch. Successive additions multiply the number of branches and the molecule becomes globular. "It's a globular molecule, not a strand, yet it is made from a vinyl monomer," Fréchet said. "To do this, we've effectively combined two methods of polymerization into one—vinyl polymerization with polycondensation. The polymerization proceeds by vinyl addition but with the 'looks' of a polycondensation, with bigger and bigger pieces coming together to form the tree-like structure."

These molecules have a single double bond like vinyl monomers, but they also have dozens or even hundreds of reactive groups. Normally, a polymer has only one reactive site, at its end. With hundreds of them, chemists can add a variety of properties. "The molecules are little globules with lots of reactive groups at their surface. If you control the surface, you control the globules: you can make them red, you can make them sticky—whatever. We're starting to bring this new family of polymers to the world of plastics," Fréchet said. "We're opening a window onto this technology, which is a low-cost way of making dendritic materials. They are less perfect than true dendrimers, but the idea works."

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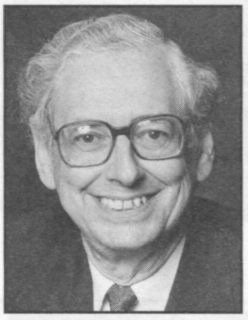

SYNTHESIZED PHEROMONE TRAPS LOVESICK TOMATO PESTS

by Larry Bernard, Cornell News Service

Cornell University scientists have isolated, identified, and synthesized the major sex attractant of the principal South American tomato pest, promising a new, natural way to control the troublesome moth. The researchers determined the chemical structure of the major pheromone of *Scrobipalpuloides absoluta*, a devastating tomato pest in Brazil and other South American countries, and have succeeded in synthesizing it so that male moths think they are finding love-starved females but fall into a trap instead.

"This mimics the role of the natural substance," said Professor Jerrold Meinwald, whose group did the work with an international team of researchers. "You put this out, the males take off, fly to it, land— exactly the same behavior as they show toward a virgin female."

The finding means that an environmentally friendly control to the pest is at hand. Currently, about 70 percent of Brazil's 2.2 million tons of tomatoes is sprayed with a chemical insecticide annually to combat the critters. The researchers expect that up to 90 percent of that spraying can be eliminated using this new synthesized bait.

The larvae of this moth can be ruthless, eating not only the leaves of the tomato plant, but the tomato itself, stem and all, in some cases causing 100 percent losses in fields, said Athula B. Attygalle, senior research associate who led the work with Meinwald. Their report was published in the July 31 edition of *Tetrahedron Letters*. Authors are Attygalle, Gulab N. Jham of Brazil, Ales Svatos of the Czech Republic, Rosa T. S. Frighetto of Brazil; and Meinwald, all who work or were working at Cornell at the time the work was done; and from the Universidade Federal de Vicosa, Evaldo F. Vilela, Fernando A. Ferrara, and Manoel A. Uchoa-Fernandes.

Identifying this new chemical pheromone—identified as 3,8,11-tetradecatrienyl acetate—was not easy. The female releases it only for about 30 minutes per day, and at a fixed time—5:00 a.m. Researchers from Universidade Federal de Vicosa obtained minuscule amounts from the moth's glands and sent the sample to Ithaca, where Attygalle and his team subjected it to gas chromatography and mass spectroscopy. The structure was then confirmed by a chemical synthesis. Still, it turned out this pheromone was unlike any other they had seen before, and the researchers had to devise a new technique for determining its structure, with only about 100 nanograms of natural chemical to work with—less than one millionth of a gram. After synthesizing the substance, the group took it to Brazil and tested it in field traps.

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JOHNSON & JOHNSON AWARDS $270,000 FOR BIOMEDICAL RESEARCH

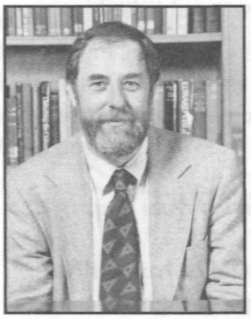
Johnson & Johnson, the medical products and pharmaceutical manufacturer, has awarded Dr. Harold Scheraga a $270,000 grant over three years to investigate how ribonuclease A and thrombin fold and how thrombin interacts with its receptors. Scheraga's integrated experimental and theoretical inquiry will examine how interatomic interactions determine the manner in which a polypeptide chain folds into the native conformation of a protein (the protein-folding problem), and how the resultant protein carries out its biological function in interactions with both large and small molecules, as in enzyme-substrate, hormone-receptor, or antigen-antibody interactions (docking).

He is conducting experimental folding studies using bovine pancreatic ribonuclease A, and experimental docking studies using the thrombin-fibrinogen (clotting) system in blood. Theoretical folding studies attempt to surmount problems arising from the multitude of minima in the multidimensional conformational energy surface of a protein, which makes it difficult to reach the global minimum that corresponds to the native structure. Theoretical docking studies examine the interactions of thrombin with fibrinogen, hirudin, and various receptors.

Standing left to right: Jaroslaw Kostrowicki, Jean-Yves Trosset, Harold Scheraga, Herschel Weintraub, Bruce Ganem. Sitting: Elsie DiBella, Muriel Maurer, Walid Houry, and David Rothwarf.

The grant was awarded to Scheraga through Johnson & Johnson's Focused Giving Program, which funds research in health care products at leading universities and research institutions.

BAKER LECTURER ILLUMINATES FEMTOSECOND SPECTROSCOPY



Graham R. Fleming, the Arthur Holly Compton Distinguished Service Professor at the University of Chicago, is in residence at Cornell through the month of November as the 1995 George F. Baker lecturer.

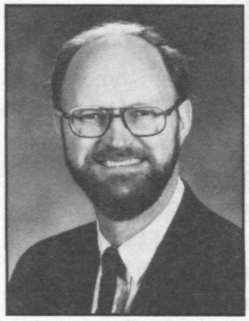
Fleming's Baker Lecture series outlines his work with ultrafast spectroscopy as a method of studying dynamic processes in complex systems such as liquids, solutions, and the role of proteins in photosynthesis. Fleming's University of Chicago group has successfully combined theory and computer simulation with femtosecond spectroscopy to interpret what happens in certain chemical events occurring on ultra short time scales. He is the author of *Chemical Applications of Ultrafast Spectroscopy* (Oxford).

Fleming's research at Chicago attempts to provide a molecular-level description of the role of solvents in chemical reactions, probing the dynamics of simple reactions in solution by creating wave packets in the reaction coordinate, monitoring the process through the motion of the wave packet, and thereby building descriptions of liquids in terms of characteristic spectral densities.

Moreover, Fleming's work attempts to manipulate and modify molecular dynamics by developing complex pulse sequences, thereby arriving at more detailed characterizations of molecular response functions and spectral densities. "For example," he writes, "current techniques for measuring spectral densities relevant to Raman or optical Kerr measurements cannot distinguish between homogeneous or inhomogeneous descriptions of the spectra. Nonresonant experiments at the fifth order can provide such a breakdown of spectra, in analogy to two-dimensional NMR. We have the ability to control the relative phase of sequences of ultra short pulses and plan to use this new technique to control and study molecular dynamics."

Fleming earned a doctorate from the University of London in 1974 and was a Leverhulme Fellow at London's Royal Institution before arriving at Chicago in 1979. He is a fellow of the American Academy of Arts and Sciences and of the Royal Society, and has been an Alfred P. Sloan Foundation Fellow, a Camille and Henry Dreyfus Teacher-Scholar, a Guggenheim Fellow, a holder of the Coblenz Award, and of the Royal Society's Tilden Medal. He is the 1995 winner of the American Chemical Society's Nobel Laureate Signature Award for Graduate Education in Chemistry.

CALIFORNIAN DELIVERS SECOND AGGARWAL LECTURES



The second round of the Aggarwal Lectures in Polymer Science, convened on September 20–21, 1995, was addressed by Robert Grubbs, a distinguished polymer scientist and the Victor and

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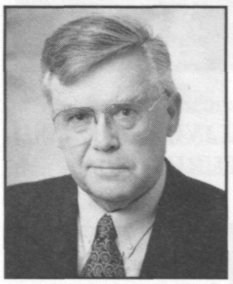
Elizabeth Atkins Professor of Chemistry at the California Institute of Technology. Grubbs delivered two lectures on the successive days, entitled "The Development of Catalysts for the Ring-Opening Metathesis Polymerization of Cyclic Olefins," and "The Use of Transition Metal Catalysts in *continued from page 7*
the Synthesis of Polymers and Other Organic Molecules."

Dr. Grubbs has been on the chemistry faculty at Caltech since 1978. He was at Michigan State University previously and held a NIH postdoctoral position at Stanford University from 1968–69. His research interests are in polymer, organic, and organometallic synthesis.
Professor Grubbs's awards have included an Alfred P. Sloan fellowship, a Camille and Henry Dreyfus Teacher-Scholar Award, an Alexander von Humboldt fellowship, ACS National Award in Organometallic Chemistry, the Arthur C. Cope Scholar Award, and the ACS Award in Polymer Chemistry. He is a member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences.

The Aggarwal Lectures in Polymer Science are sponsored by Sundar L. Aggarwal PhD '49 and were inaugurated in May 1995 by C. Grant Willson of the University of Texas, Austin. The May 1996 installment of the Aggarwal lectures will be addressed by Helmut Ringsdorf of the University of Mainz, Germany.

"GRAND OLD MAN" DELIVERS FIRST ROESSLER LECTURE



Chemical & Engineering News, in a June 26, 1995, article, refers to Emanuel Vogel of Cologne University as "a grand old man of German chemistry" for his pioneering work in porphyrin isomer synthesis.

Vogel, an emeritus professor in Cologne University's Institute for Organic Chemistry, visited Cornell on October 2, 1995, to deliver the inaugural Franz and Elisabeth Roessler Lecture, the first lecture in the department's annual Organic/Organometallic Lecture Series. Noted for his exciting presentations, his Roessler lecture was entitled "Adventures in Porphyrin Chemistry: From Cyclotetra– to Cycloocta–pyrroles."

Porphyrins are physiologically important macrocyclic compounds imparting characteristic color and reactivity to molecules such as hemoglobin and chlorophyll, which play a central role in such biological processes as oxygen transport, electron transfer, and photosynthesis. Vogel's work in the last decade has pioneered the preparation and study of nonnatural porphyrin isomers such as porphycene, his initial isomeric arrangement of porphyrin in a stable macrocycle not found in nature.

Building on Vogel's groundbreaking synthesis, other novel porphyrin analogs have recently been produced, one of them, corrphycene, by another Vogel research team. Porphycene itself is aesthetically as well as chemically interesting because it crystallizes as deeply colored violet, it fluoresces, and it yields beautiful blue solutions in organic solvents. It exhibits an unusual absorption spectrum that makes it useful in many biomedical applications.

The Franz and Elisabeth Roessler Lecture inaugurated this fall by Dr. Vogel is named in honor of an endowment to the chemistry department by Franz Roessler, a German chemist who emigrated to the United States in 1882 to found the Roessler and Hasslacher Chemical Company, once a large manufacturer of insecticides, fungicides, and refrigerants. The company became part of Dupont in 1930. Roessler's son Hans was a student in the Department of Chemistry in the early years of the century. Roessler family endowments support a named professorship in the Department of Chemistry, currently held by department chairman Bruce Ganem, as well as lecture visits by prominent German chemists.

BRIEFS

Professor **Barry Carpenter** presented an organic chemistry seminar entitled "A Bimodal Distribution of Lifetimes for a Reactive Intermediate: Implications for Mechanistic Interpretation" at the University of California, Berkeley on October 10, 1995.

Cornell chemists, bemused browsers, and interested readers can find each new issue of *Cornell Chemistry* on the World Wide Web at **<http://www.chem.cornell.edu/chemnews.html>.**

polymers*—continued from page 6*

Working with Craig Hawker at IBM-Almaden, Fréchet has also adapted the process to use "living" free radicals. This new approach complements nicely the original one because it can be used cheaply with many monomers. That work is submitted for publication.

This "self-condensing polymerization" process eventually may become very cheap, Fréchet envisions, making it useful for industrial coatings, lubricants, drug carriers and other advanced or "smart" materials produced in this novel way. "The versatility of the approach stems from the fact that a variety of architectures may be obtained by using several monomers to produce unusual polymer architectures in one-pot reactions," Fréchet wrote. "For example, stars and dendritic hybrid structures can be obtained by sequential addition of appropriately selected monomers. Given the interesting properties of these hybrid structures, a fast synthetic process for their preparation would be very beneficial."

Last month, Fréchet reported on a new method of dispersing metallic nanoclusters in a polymer matrix, as part of a program to disperse organic material in inorganic media. Such matrices could be used for new materials in making electronic devices. That study was published in *Science* in July.

***pheromones* –** *continued from page 6*

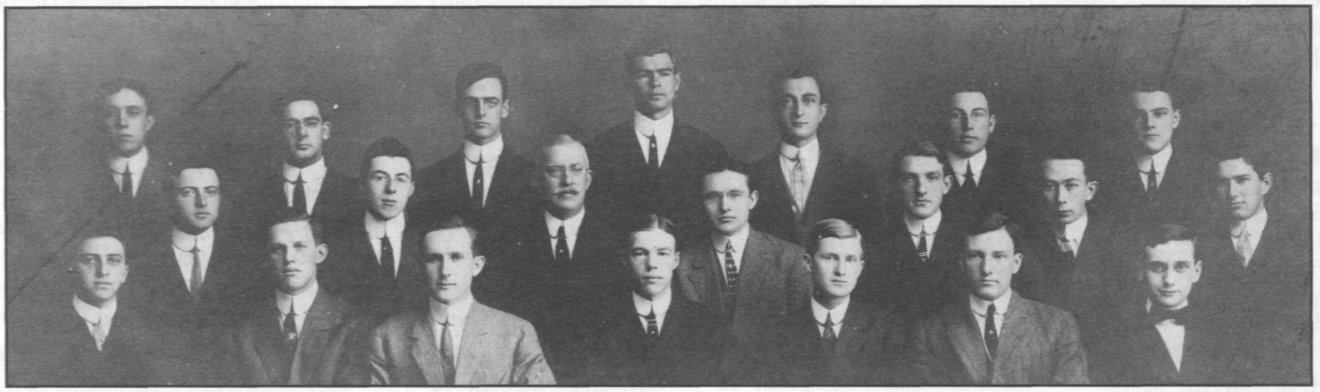
"Normally, we would be happy if we had 25 males per trap per night," Attygalle said. "With this, we got thousands! We were ecstatic."

The Cornell Research Foundation has applied for a patent on the synthesized chemical, in which several companies have expressed interest, Meinwald said. The work was supported by the National Science Foundation, the Conselho Nacional de Pesquisa (Brazil's NSF equivalent), and in part by the U. S.–Latin America Cooperative Science Program.

Editor's note: *As a result of a bumper 2.2 million ton Brazilian tomato crop,* Business Week *in its October 2 issue reports on Dr. Meinwald's work.*

Chemical Bonds

BCHEMS OF 1911



Richard E. Pawel of Oak Ridge, Tennessee, recently sent Cornell Chemistry this piece of memorabilia from the belongings of his grandfather, George W. Pawel BChem '11. "Apparently 1911 was the first year that the BChem degree was awarded by the university," he notes.
Pictured are (front row) Pawel, Mowrey, Maider, LaTourette, O'Brien, Fry, Lowrey; (second row) Wilson, Eastwood, L. M. Dennis (chairman), Ritter, Patterson, Kratz, Evans; (back row) Davis, Scharschu, Walker, Rekate, Schagrin, Hovey, Gundlach

A DIPOLE MOMENT IS FOREVER

The Dutch government has commemorated Nobel chemist, patriot, and former Cornell Chemistry chairman Peter J. W. Debye with the issuance by the PTT Post of a new postal stamp. Debye's grandson Nordulf PhD '70, a member of the chemistry faculty at Towson State University, attended ceremonies in Utrecht accompanying the issuance. He writes further that "the City of Maastricht [the elder Debye's hometown] has completed the architectural and engineering plans for a rather grand memorial for Peter Debye and anticipates finishing the project in 1998. The memorial will not be a statue of him, but rather consists of a very large sculpture (representing a molecular dipole moment) situated over a reflecting pool in the new 'Debyeplein' located in front of a local hospital."

(See related article, page 2)

MISSING ALUMNI

The following people are in our files but have incorrect address information, and some are missing other information. If anyone can help us fill in any data, please let us know—no matter how old you may think the data is, E-mail Kelly Strickland at kss1@cornell.edu Thank you.

1931 – 1940

Rundel, Guy, BChem, '31
Kirk, Joseph, PhD, '31
Tallman, Ralph, PhD, '31
Brandt, Preston, grad, '32
Smith, Harry, grad, '32
Wright, John, MA, '32
Dewey, Phillip, MS, '32
Ellis, Thomas, MS, '32
Morton, David, PhD, '32
Fernsler, Edward, BChem, '34
Keister, Edwin, grad, '34
Schofield, Daniel, MS, '34
Vittum, Paul, PhD, '34
Wallace, Wilson, BChem, '35
Chapin, John, BS, '35
Longley, Raymond, grad, '36
Hayward, Frederick, PhD, '36
Baxter, Harold, BChem, '37
Wacker, William, BChem, '37
Cowan, John, grad, '37
Green, James, grad, '37
Fujimoto, Giichi, grad, '38
Gregg, Charles, MA, '38
Ingerson, Thomas, BChem, '39
Markowitz, Irving, MA, '39
Smith, Earl, PhD, '39
Clack, K., PhD, '40

1941 – 1950

Ball, Frederick, BChem, '41
Roth, Jay, MS, '41
Becker, Arnold, AGR, '42
Condike, George, '43
Whitcomb, Dorothy, AB, '43
McDuffie, Bruce, grad, '43
Phelan, James, grad, '43
Sykes, Harry, PhD, '43
Walker, Herbert, PhD, '43
Hansen, Ralph, AB, '44
Bengelsdorf, Irving, AB '44
Haynke, Carl, grad, '44
Zelikoff, Murray, MS, '44
Robertson, James, PhD, '44
Ryan, James, PhD, '44
Stroupe, James, PhD, '44
Winslow, Eugene, PhD, '44
Dittman, Albert, PhD, '45
Cohen, Soloman, AB, '46
Smith, Benjamin, AB, '47
Mittenthal, Richard, AB, '48
Landis, Frank, MA, '48
Rushmer, Ralph, MS, '48
Gedell, Ragnar, grad, '49
Milberg, Morton, PhD, '49
Becker, Norwin, AB, '50
Gray, Jr., Arthur, AB, '50
Hedberg, John, AB, '50

Kazimi, Abdul, AB, '50
Konecny, Jan, AB, '50
Rosenberg, Barbara, AB, '50
Simonds, Donald, AB, '50
Brown, Eric, grad, '50
Scherr, Charles, grad, '50
Burnett, Peter, MS, '50
Jones, Samuel, PhD, '50
Westfahl, Jerome, PhD, '50

1951 – 1960

Bases, Robert, AB, '51
Coester, Frederick, AB, '51
Glatstein, Norman, AB, '51
Hart, Harold, AB, '51
Minkoff, Robert, AB, '51
Sato, Toshio, AB, '51
Kleis, John, grad, '51
Keidel, Frederick, PhD, '51
Gregory, Arthur, AB, '52
Jacobsen, Slyvia, AB, '52
Morgan, William, AB, '52
Ralph, Jr., William, AB, '52
Robertson, William, AB, '52
Silbert, Daniel, AB, '52
Nilsen, Walter, MS, '52
Cohen, Abraham, PhD, '52
Streuli, Carl, PhD, '52
Wheeler, Edward, PhD, '52
Bickley, Robert, AB, '53
Dodge, Joan, AB, '53
Haddad, John, AB, '53
Rogers, Clare, AB, '53
Sticker, Robert, AB, '53
Watson, Edward, AB, '53
Gustavson, Marvin, PhD, '53
Pigeaud, Adolph, MS, '54
Abramson, Ira, AB, '55
Hsu, Cher, AB, '55
Jacobs, Daniel, AB, '55
Smith, Robert, AB, '55
Calo, Aurora, MS, '55
Verdol, Joseph, PhD, '55
Fisher, Richard, AB, '56
Greenberg, Stanley, AB, '56
Schrody, Joseph, AB, '56
Kuwana, Theodore, MS, '56
Cohen, Robert, PhD, '56
Di Pietro, Americo, PhD, '56
Mark, Eliza, PhD, '56
Carter, James, AB, '57
Krieger, Jr., Frederick, AB, '57
Gabel, Marc, AB, '58
Henderson, Roy, AB, '58
Frank, Martin, AB, '59
Kay, Peter, AB, '59
Rufeh, Firooz, AB, '59
Ehrlich, Garry, PhD, '59
Takashima, Herbert, PhD, '59
Matsushita, Tatsuo, AB, '60
Woo, Ching, AB, '60
Littman, Sandra, grad, '60
Rizk, Maurice, grad, '60
Glasser, L., PhD, '60

1961 – 1970

Block, Arthur, AB, '61
Halpern, Gerald, AB, '61
Hooper, N., AB, '61
Kaufman, W., AB, '61
Lappeman, Myron, AB, '61
Bottomley, Charles, PhD, '61
Cadoff, Barry, PhD, '61
Mesirov, Michael, PhD, '61
Aanning, Harald, AB, '62
Di Cyan, Adrian, AB, '62
Gross, Gary, AB, '62
Hymans, William, AB, '62
Kazaras, Michael, AB, '62
Maxey, Jr., Fred, AB, '62
Schuster, Arnold, AB, '62
Wepner, Franklyn, AB, '62
Wu, Anna, AB, '62
Yeganeh, Cyrus, AB, '62
Richard, Alan Vinton, MS, '62
Connolly, Donald, PhD, '62
Glen, Gerald, PhD, '62
Tiensuu, Victor, PhD, '62
Lombardi, John, AB, '63
Miller, Mark, AB, '63
Perry, John, AB, '63
Skloven, Z., AB, '63
Tomboulian, Lawrence, AB, '63
Weber, Joann, AB, '63
Cha, Chul-Yung, PhD, '63
Karger, Barry, PhD, '63
Nealy, David, PhD, '63
Bailey, John, AB, '64
Mech, John, AB, '64
Schwartz, Alan, AB, '64
Szerenyi, Peter, AB, '64
Comunale, Giuseppe, MS, '64
Naidich, Thomas, AB, '65
Rauch, Erika, AB, '65
Sultanoff, Barry, AB, '65
Abdel-Rehim, Hosam, MS, '65
Arakawa, Tamid, PhD, '65
Perkins, Nancy, PhD, '65
(Shaw) Dine, Ruth , PhD, '65
Snyder, James, PhD, '65
Rietz, Richard, AB, '66
Younger, Peter , AB, '66
Dalzell, Haldean, PhD, '66
Lee, Byungkook, PhD, '66
O'Donnel, Maureen, PhD, '66
Butcher, Bruce, AB, '67
Cohen, Jonathan, AB, '67
Klein, Alan, AB, '67
Platzer, Karen, AB, '67
Rosenstein, Lee, AB, '67
Russo, Joseph, AB, '67
Schwartz, Ralph, AB, '67
Zeiss, Geoffrey , AB, '67
Durandetta, Donald, PhD, '67
Go, M., PhD, '67
Jesaitis, Raymond, PhD, '67
Gould, Roy, AB, '68
Kelley, Robert, AB, '68
Martin, Thomas, AB, '68
Mitchell, Peter, AB, '68
Schulof, Richard, AB, '68
Simons, Peter, AB, '68
Volent, Ivan, AB, '68
Gaal, William, PhD, '68
Zavistoski, James, PhD, '68
Gillette, Thomas, AB, '69
Pines, Ira, AB, '69
Kellogg, Ernest, PhD, '69
Uno, Fumio, PhD, '69
Kneezel, Lawrence, '70
Goldenberg, David, AB, '70
Levine, Paul, AB, '70
Strayer, David, AB, '70
Leroy, Elsie, grad, '70
Melander, Wayne, PhD, '70
van Vuuren, Janse, PhD, '70

1971 – 1980

Logigian, Eric, AB, '71
Mitlitzky, Janice, AB, '71
Niver, David, AB, '71
Wolfe, Mary, AB, '71
Fanso-Free, Samuel, MS, '71
Haidle, Rudy, MS, '71
Kornfeld, Richard, PhD, '71
Swenson, Jerrald, PhD, '71
Taylor, Gerard, PhD, '71
Jones, Lawrence, AB, '72
Sennett, Margaret, AB, '72
Buryan, Richard, AGR, '72
Cornelius, Dennis, PhD, '72
DeFranco, Robert, PhD, '72
Steger, John, PhD, '72
Allen, Barbara, AB, '73
Chong, Anthony, AB, '73
Grant, William, AB, '73
Hirsch, David, AB, '73
Lehr, Timothy, AB, '73
Marsh, Jonnise, AB, '73
Ocken, Stephen, AB, '73
Ross, Maureen, AB, '73
Wawro, Walter, AB, '73
Zimmer, Patrick, AB, '73
Kwok, Kain Sze, PhD, '73
Horton, Christy , AB, '74
Mazanec, Terry, AB, '74
Nash, Eileen, AB, '74
Podolske, James, AB, '74
Silberstein, Richard, AB, '74
Starobin, Joseph, AB, '74
Tusa, Philip, AB, '74
Platt, Norma, MS, '74
Haiby, William, PhD, '74
Boxer, Matthew, AB, '75
Gerbarg, Zachary, AB, '75
Masters, Paul, AB, '75
Wroble, Randall, AB, '75
Lim, Phooi, BS CE, '75
Chou, Kuo-Chem, PhD, '75
Lad, Pramod, PhD, '75
Nielsen, Norman, PhD, '75
Straub, Walter, PhD, '75
Apple, David, AB, '76
Chen, Sen, AB, '76
Fine, Jeffrey, AB, '76
Czurylo, E., PhD, '76
Hageman, Thomas, PhD, '76
McHale, Angelika, PhD, '76
Smith, Leverett , PhD, '76
Fay, Peter, AB, '77
Lovett, Susan, AB, '77
Novak, Mike, PhD, '77
Po, Pui, PhD, '77
Chang, Alexander, PhD, '78
Yee, Ying, PhD, '78
Yuen, Maria, PhD, '78
Graves, Lisa, AB, '79
McClean, John, AB, '79
Parker, Charles, AB, '79
Smith, Gordon, AB, '79
Jones, Brian, MS, '79
Frank, Z., PhD, '79
Ho, Sa, PhD, '79
Murad, Sohail, PhD, '79
Schilling, Birgitte, PhD, '79
Van Derveer, Michael, PhD, '79
Chang, Mary, '80
Coulter, Susan, AB, '80
Satcher, Mikel, AB, '80
Seewaldt, Victoria, AB, '80
Walker, Derrick, AB, '80
Ticzon, Edgar, MS, '80
Mun, In Ki, PhD, '80
Petersen Roellig, Marianne, PhD, '80

1981 – 1986

Cascio, Michael, AB, '81
Grant, Angela, AB, '81
James, Michael, MS, '81
Brickner, Steven, PhD, '81
Scott, Thomas, PhD, '81
Sueki, Mitsuru, PhD, '81
Wheeler, Michael, PhD, '81
Gonzalez, Prolongo , PhD, '82
Kidera, A., PhD, '82
Joseph, Nilufer, AB, '83
Kaussner, Andrea, AB, '83
Rendleman, Rebecca, AB, '83
Rendleman, Rebecca, AB, '83
Stillerman, Audrey, AB, '83
Bower, Robert, PhD, '83
Aguiar, Eric, AB, '84
Latella, John, AB, '84
Rigden, Lawrence, AB, '84
Tulchinsky, Amir, AB, '84
Tulchinsky, Amir, AB, '84
Cortelli, Leonard, MA, '84
Namboodiri, Sally, AB, '85
Eason, Robert , MS, '85
Park, Seong Ju, PhD, '85
Chin, Lawrence, AB, '86
Johnson, Leonie, AB, '86
Margolis, Eric, AB , 86
McPherson, Katherine, AB, '86
O'Bannon, Patrick, AB, '86
Shin, Alexander, AB, '86
Ting, Henry, AB, '86
Tomko, Martin, AB, '86
Vogel, Peter, AB, '86
Kagan, Mark, MS, '86
Kagan, Mark, MS, '86
Zhao, Yuzhen, MS AGR, 86
Kimbrough, Doris, PhD, '86

1951–1960

George E. Hein AB '54 recalls his salad days when "Franklin Long and John R. Johnson ran a senior seminar for about a dozen of us serious chemistry majors. . . I struggled to synthesize cyclopentadiene anion to see if it had any aromatic properties. I recall lots of sodium dissolved in liquid ammonia and one spectacular explosion that left me deaf for a whole day." George earned his doctorate in chemistry at the University of Michigan and is currently director of the program evaluation and research group at Lesley College in Cambridge, Massachusetts. "Although I left the field of chemistry many years ago for a career in education, what I learned about doing research during that year has been a benefit to me ever since."

One of the luxuries of retirement, notes **A. William Johnson** PhD '57, is checking your e-mail once a week. Johnson was recently named professor emeritus of chemistry at the University of North Dakota, where he spent most of his career as a chemistry professor and dean of the graduate school. "I remain active otherwise," he writes, having spent the 1994–95 academic year as a visiting professor at the U. S. Military Academy at West Point and being currently immersed in work on an inorganic chemistry text.

1961–1970

Was there champagne in Champaign? Illinois boasts another Cornell retiree, **Rodney Ruch** PhD '65, who left the Illinois State Geological Survey after nearly three decades. Dr. Ruch was named emeritus senior chemist in the survey's energy and mineral resources group in recognition of his distinguished service and noteworthy professional contributions. Ruch's first task as an associate chemist with the survey was to establish a neutron activation analysis laboratory to determine trace elements in geological materials, principally in Illinois coal. Besides trace-element analysis, his research interests have also included tracer studies in coal cleaning, fine-coal cleaning, and analysis of coal and related materials. Ruch served as head of the survey's analytical chemistry section, the minerals engineering section, and, since 1989, as senior chemist and assistant branch chief of mineral resources and engineering. In 1993 he became acting head of the energy and mineral resources group.

1971–1980

Rafael Aviles writes, "I was a postdoctoral fellow at Cornell in 1979–1980, working with Paul Houston. I am now a research manager at Rohm and Haas in Spring House, Pennsylvania. I work in the water soluble polymers area, directing a group of 20 researchers in new product development."

Jack Fassett PhD '78, a program analyst at the National Institute of Standards and Technology, writes from Gaithersburg, Maryland, "I am now working on detail in the program office at NIST, where I have met **George Mulholland** [PhD '73] who is also working here on detail. **Paul Paulsen** [PhD '62] retired in December after 32 years in government service at NIST. And Ben Widom's daughter, Liz, is in the second year of a National Research Council/NIST postdoctoral research associateship."

Earl Harrison AB '71 thanks us for a "well-conceived" *Cornell Chemistry* and reports that he is a professor in the department of biochemistry at the Medical College of Pennsylvania in Philadelphia. "As a not very distinguished undergraduate chemistry major," continues the distinguished doctor, "I nonetheless had the opportunity to do research in my senior year with Donald McCormick, then a professor in the section of biochemistry and molecular biology and the Division of Nutritional Sciences. This led me to an interest in the chemistry, metabolism, and function of vitamins, which I continue to pursue today. My current research is largely focused on enzymes involved in the metabolism of retinoids (vitamin A) and on the transport, metabolism, and function of carotenoids in humans."

"Thanks for 'finding' me," responds lost-and-found **George Mulholland.** "I was a student of Ben Widom's, getting my PhD in 1973. I am currently working in the program office at NIST along with **Jack Fassett,** another Cornell alumnus [see above]. My major responsibilities are providing staff support for the director for the activities of the Advanced Technology Program and the Building and Fire Research Program. This has been a challenging assignment because of the numerous attacks on ATP by Republican Congressmen."

1981–1990

"I am working on a PhD in physical chemistry (theoretical) with Bill Reinhardt here at the University of Washington," **Tom Davis** MS '86 informs us. "I should be finishing in the next year or two."

Deborah Leckband PhD '88 has resurfaced, "basically doing surface force measurements on biological systems," at the University of Illinois at Urbana–Champaign.

"I'm **Helen Pak-Harvey,**" remembers the former Helen Pak AB '84. "My mailing address was given to Cornell by a colleague of mine and I'm quite delighted to now be receiving *Cornell Chemistry*. I am currently working as a technical manager in the emulsion polymers division at Reichhold Chemicals in beautiful Research Triangle Park, North Carolina. I made the switch from the pharmaceutical to the chemical industry about five years ago and I quite enjoy it. It's been particularly interesting working at Reichhold because we are wholly owned by a Japanese company named Dainippon Ink & Chemicals, and dealing with the Japanese has been a real eye-opener for me. I will be moving into the commercial development group next year to serve as the technology liaison for Reichhold. My charter will be to evaluate new technologies and markets for Reichhold's existing businesses and help spawn new ones. I'd like to send warm regards to my favorite (and only) undergraduate advisor, David Collum."

"I've been enjoying *Cornell Chemistry* and figured it was about time to write in," confesses Bostonian **Seward Rutkove** AB '85. "I just joined the faculty of Harvard Medical School as a neurologist at Beth

Israel Hospital. I'm doing clinical research in neuromuscular disease, far away from any beakers or flasks. Occasionally, though, we do use acetone for cleaning, the odor of which brings back fond memories of long nights in Dr. Wilcox's lab."

"I did my PhD with Barry Carpenter in December 1982," admits **Ashoka G. Samuelson** from Bangalore, far down the Indian subcontinent. "I am an associate professor at the Indian Institute of Science at present and am an inorganic chemist!" Each issue of *Cornell Chemistry,* he writes, "is definitely something I look forward to."

1991–1995

Adil Dhalla PhD '93, a former student of Professor Wilcox's, writes, "I am currently at Bristol-Myers Squibb Pharmaceutical Research Institute in Princeton. Prior to this I was a postdoctoral fellow with Professor Villafranca at Penn State University from September 1992 to October 1993. He has since moved to B-MS PRI and I joined his group here in November 1993."

Life is full of surprises. "I certainly would not have thought it would happen after only four years at Lilly," writes a peripatetic **Joerg Pfeifer** PhD '91, "but I have left the process development lab in Lafayette, Indiana and am now at the corporate center in Indianapolis. The new job is in the human resources organization. I am the PhD recruiter for Eli Lilly Company's Lilly Research Laboratories. Recruiting chemists, especially organic ones, is the easy part." Joerg seems like a good person to know.

Kazunari Yoshizawa, a visiting scientist in the Hoffmann group during 1994–95, is now an assistant professor in the Graduate School of Engineering, Kyoto University. "My current interests include theoretical chemistry of molecular ferromagnetism and molecular superconductivity," he writes. "I would like to send my best regards to my favorite Hoffmann group. *Cornell Chemistry* reminds me of my happiest days in Ithaca."

In Memoriam

Thomas Blash BChem '40, in Atlantis, Florida
Rolf Hemmerich BChem '37, on July 18, 1995 in Grand Junction, Colorado
Eileen V. O'Gorman MS '91, on May 12, 1995 in Los Angeles
Harold S. Schwenk '31 in Storrs, Connecticut

Cornell Chemistry *is published by the Department of Chemistry at Cornell University.*
Bruce Ganem, Chairman
Earl Peters, Executive Director
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Kelly Strickland, Managing Editor

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