

# Cornell Chemistry

August 1994  
Issue 60

## H. Floyd Davis

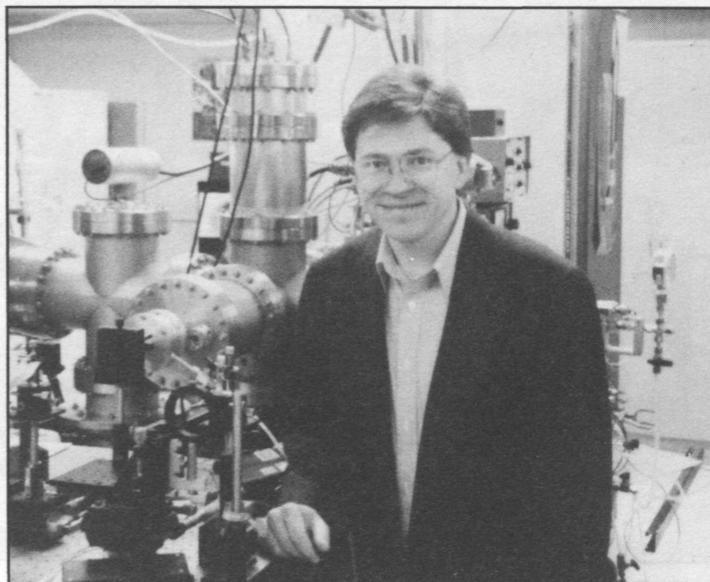
In the last issue of the newsletter we introduced you to one of our two new faculty members, Melissa Hines. Now meet H. Floyd Davis.

Dr. Davis, a native of Waterloo, Ontario, received a Bachelor of Science Degree from the University of Waterloo, then pursued his PhD at the University of California at Berkeley under the direction of Professor Y.T. Lee in the area of bimolecular and unimolecular reaction dynamics. His research as a postdoctoral associate in Professor Curt Wittig's group at the University of Southern California has involved the unimolecular decomposition of vibrationally excited molecules prepared by visible or infrared excitation.

Davis, who won a U.C. Berkeley Department of Chemistry Outstanding Teaching Award, feels that it is important when teaching introductory chemistry to illustrate how our science relates to everyday problems of economics, government policy, and the global environment. He also wants to show students that their problem-solving skills can be brought to bear in many different areas of life.

"In the real world," he says, "there are often many 'correct' solutions to problems; some may just be better than others." The following is Professor Davis's description of the research he will carry out at Cornell.

"We wish to develop a fundamental understanding of the physical and chemical interactions between species containing valence d-electrons (i.e., transition metals) and small covalently bound molecules such as hydrogen and methane. Such interactions are of fundamental importance in catalysis, surface chemistry, and organometallic reactions. Although it is widely recognized that the activities of transition metal atoms, complexes, and surfaces toward hydrogen and hydrocarbons are due to the presence of low-lying partially filled d-orbitals, *precisely how does the electronic structure of a transition metal center control chemical reactivity?* We address questions such as this through detailed experimental



studies of the unimolecular and bimolecular reactions of simple prototype *neutral* transition metal systems under well-defined conditions.

"Our experimental approach is based on the use of laser ablation for production of transition metal atomic and molecular beams having narrow ranges of internal and translational energies. In all of our studies, reactants and products are studied in detail using mass spectrometry and laser-induced fluorescence spectroscopy. Two complementary experimental approaches are employed. In the first, we study the structure, thermochemistry, and photochemistry of simple neutral transition metal hydrides, alkyls, carbenes, and van der Waals molecules. These simple, theoretically tractable molecules will serve as *benchmark prototypes* for the development of fundamental chemical concepts.

"We also study the *bimolecular reaction dynamics* of neutral transition metal atoms and small transition metal complexes with hydrogen and hydrocarbons using crossed molecular beams. In studies of transition metal *atom* reactions, a tunable laser is employed to prepare well-defined excited reactant atomic states. We compare the reactivities of different excited atomic levels with a given molecule to directly assess the role of orbital occupancy and electronic symmetry in the absence of ligand effects. These experiments provide detailed insight into the dynamics of chemical reactions by measuring product branching ratios for competing channels, as well as the translational, angular, and quantum state distributions of the product.

"Our goal is to address questions of fundamental chemical importance: How does electronic energy compare with translational or vibrational energy in promoting chemical reaction? Is the reaction mechanism direct abstraction or insertion? How do the dynamics of reactions initiated by random bimolecular collisions compare with those initiated at a restricted initial geometry in van der Waals complexes? What is the dependence of the alignment of an excited atomic orbital on reactivity? By establishing fundamental chemical concepts through studies of simple transition metal reactions, we will better understand the underlying chemistry of more complex systems."

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## Commencement 1994

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*The Class of 1994*

Cornell University held its 126th Commencement on Sunday, May 29, 1994. After the ceremonies at Schoellkopf Field, a brief reception was held in Baker Laboratory for graduating chemistry majors and their families.

The following received the Bachelor of Arts degree in a ceremony held in Baker 200:

Victoria Baeger, Sudip Bose, Jacqueline Chang, Amy Cheung, Robert Chisholm, Peter Choi, Sang-Ah Chun, Christopher Claps, Robert Cunningham, Lily Eng, Leonardo Etcheto, Susan Ghanbarpour, Ganga Hapangama, Shemin Hirji, Richard Huang, Sarah Hult, David Inoue, Marc Itskowitz, Jean Ku, Kenneth Li, Ruth Lin, Britt Lindberg, Josephine Liu, Jeffrey Lubin, Cynthia Mann, Donna Muise, Paul Mutolo, Quan Nguyen, David Patariu, Pulin Patel, Stephen Penepacker, Kristie Phillips, Edward Ray, Todd Ryder, James Sang, Mark Searles, Joseph Shipman, Darius

Sholevar, Amir Shuja, Jill Simpson, Rachana Singh, David Siska, Robert Steward, III, Samson Tom, Daniel Weiland, Donna Windish, Mason Wolak, Jin Zhang.

Graduating with honors were:

**Summa cum laude**

Thomas Cameron, Katherine Hutchison, Brent Stockwell

**Magna cum laude**

Nathaniel Brackett, Steven Harford, Semil Mehta, Pari Pandharipande

**Cum laude**

Bun Jim, Christina Lee

**January degrees:** David Argent, Sean Boerke, John Hirt, Perry Soriano, and Gary Wang.

## Undergraduate Awards for 1994

### Leo and Berdie Mandelkern Prize

Awarded annually to an outstanding student of the senior class majoring in chemistry who will go on to graduate study in chemistry or biochemistry.

**Brent Stockwell, '94**

### George C. Caldwell Prize

Awarded annually to two senior chemistry majors who have shown general excellence.

**Thomas Cameron, '94**

**Katherine Hutchison, '94**

### American Institute of Chemists Medal

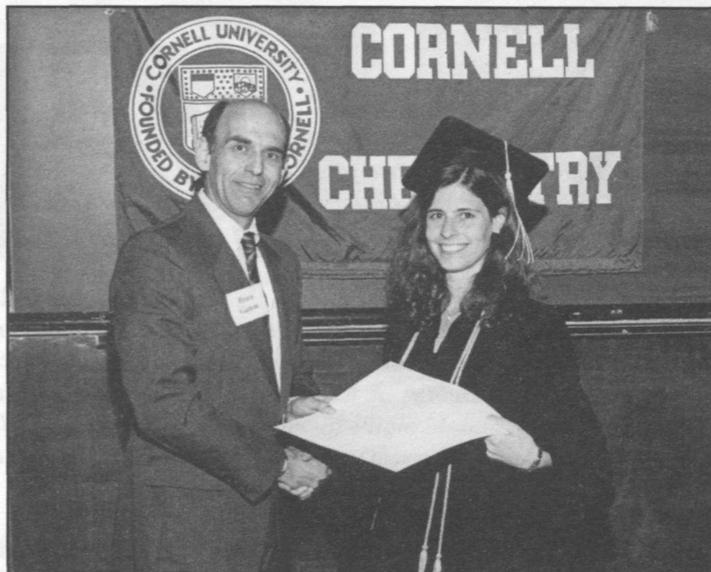
Awarded to an outstanding graduating senior who has a demonstrated record of leadership, ability, character, and scholastic achievement.

**Jacqueline Chang, '94**

### Merck Index Award

This award consists of a Merck Index with the name of the recipient imprinted in gold. Awards are made each year to the two outstanding students of the senior class who are majoring in chemistry.

**Steven Harford, '94**



*Bruce Ganem with Katherine Hutchison*

### ACS Analytical Prize

This prize is intended to recognize a student in the College of Arts and Sciences who has completed the third year of undergraduate study and who displays interest in and aptitude for a career in analytical chemistry. The recipient receives an 8-month (16 issues) subscription to *Analytical Chemistry*.

**Lecia Van Dam, '95**

### Harold Adlard Lovenberg Prize

Awarded annually to a member of the junior class with a major in chemistry who has shown general excellence.

**Michael Krochmal, '95**

### CRC Press Chemistry Achievement Award

This is presented to two sophomore chemistry majors who do outstanding work in organic chemistry courses 357-358 or 359-360.

**Philip Geissler, '96**

**Susan Mao, '96**

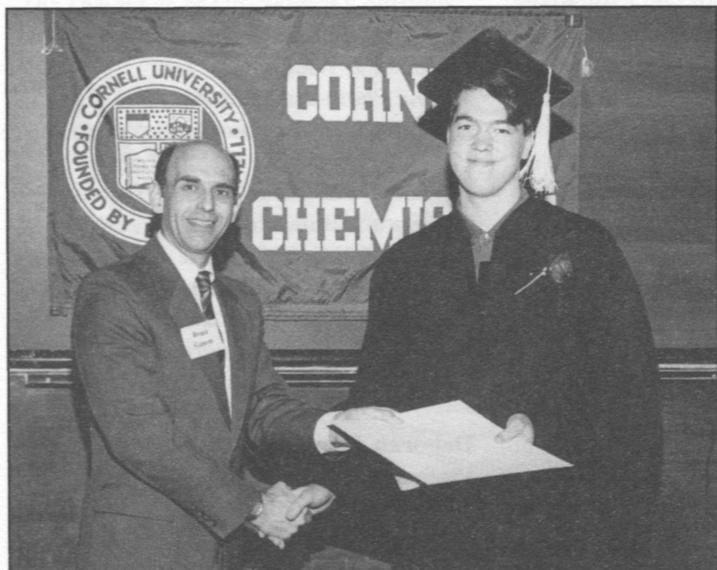
### A.W. Laubengayer Prize

Awarded annually to an outstanding student in each of the introductory chemistry courses 103, 207, and 215.

**Matthew Palmer, '96**

**Ivy Chen, '96**

**Robert Andler, '96**



*Bruce Ganem with Thomas Cameron*

# Graduate Degrees Awarded 1993-94

## August 1993

**Sheila Marie Adamus**

Professor B. Carpenter  
*Synthesis of Molecules Designed for Selective Transition-State Stabilization*

**Lizla Soco Bontuyan**

Professor P. Houston  
*State-Resolved Differential Cross Sections for Inelastic Collisions between Argon and Nitric Oxide by Ion Imaging*

**R. Samuel Boorse**

Professor J. Burlitch  
*Metal-Ceramic Adhesion: Synthesis of Aluminum and Chromium Mixed Metal Oxides and Extended Huckel Modeling of Metal-Metal Oxide Interfaces*

**Linda Sue Brinen**

Professor J. Clardy  
*Structural Studies of the Bioactive Natural Products: Gigantecin, Neamphine, Chlocophyllonic Acid A Methyl Ester and Structural Studies of a Monofunctional Chorismate Mutase*

**Scott Hayden Elder**

Professor F. DiSalvo  
*The Synthesis and Study of New Ternary Nitrides and Oxynitrides Prepared from the Ammonolysis of Ternary Oxides*

**Karen Marie Mattia**

Professor B. Ganem  
*Synthesis and Evaluation of a Putative Branchpoint Intermediate in the Shikimic Acid Biosynthetic Pathway*

**Rebecca Lynne Miller**

Professor P. Wolczanski  
*Synthesis and Reactivity of Low-Coordinate Ditantalum and Ditungsten Silox Complexes (Silox-Tri-Tertbutyl-Siloxide): Cleavage of G-O and C-C Bonds*

**Chris Patrick Schaller**

Professor P. Wolczanski  
*Carbon-Hydrogen Bond Activation and Related Reactions Involving Early Metal Amido and Imido Complexes*

**Norah Elizabeth Shemetulskis**

Professor R. Loring  
*Theoretical and Simulational Studies of Linear and Nonlinear Spectroscopy in Polar Fluids*

**Nathan Otto Siemers**

Professor J. McMurry  
*The Development of a Molecular Mechanics-Based Model to Predict Diol*

*Stereo-Chemistry in Low Valent Titanium Mediated Pinacol Coupling Reactions. Successful Application of This Model Toward the Total Synthesis of Periplanones C, D, and A*

**Clarence Joseph Wang**

Professor D. Usher  
*An Oligonucleotide Analog with Non-Ionic Carboxamide Linkages: Molecular Mechanics Study and Synthesis of the Monomer*

**Karen Lynn Wooley**

Professor J. Fréchet  
*Design, Synthesis, and Properties of Dendritic and Hyperbranched Macromolecules*

## January 1994

**Vandana (Arora) Bindra**

Professor A. Kuki  
*Design, Synthesis and Conformational Analysis of Electronically Active 3<sup>10</sup>-Helical Peptides Rich in Aib-Class Amino Acids*

**Michael Jerome Daniels**

Professor J. Wiesenfeld  
*Ozone Photo-dissociation and Photoproduct Chemiluminescence*

**Florangel Dilig Duldulao**

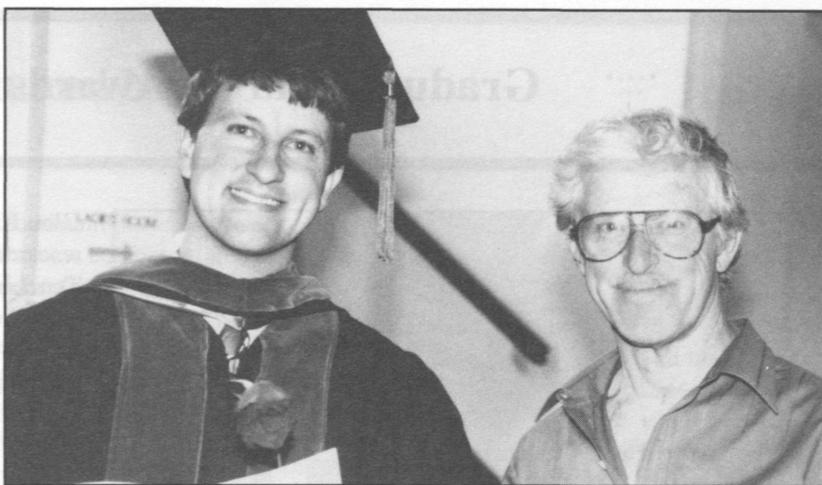
Professor J. Burlitch  
*Toward Oxidatively Stable Interfaces in Fiber-Reinforced Ceramic Matrix Composites: Syntheses and Characterization of Fluoridated Layer Silicates from Sol-Gel Derived Precursors*

**Deborah Jean Gilbert**

Professor F. DiSalvo  
*In Search of Conducting Materials Via the Chemical Oxidation of Extended Solids Containing Linked Clusters*



Sheila Adamus with her sister, Sharon Caraballo.



Stephen P. Smith with his father, Chas Smith.

**Timothy John Glines**

Professor B. Carpenter

*The Role of Dinuclear Metal Complexes in the Reppe Cyclotetramerization of Alkynes: A Modeling Study*

**Robert Anthony Heintz**

Professor K. Theopold

*The Synthesis, Structure, and Reactivity of Paramagnetic Organometallic Chromium Complexes*

**Stephen Bruce King**

Professor B. Ganem

*Synthetic Studies on Mannostatin A and Its Derivatives: A New Family of Alpha-Mannosidase Inhibitors*

**Jonathan Lee Mumford-Zisk**

Professor G. Morrison

*Standards for Quantitative Ion Microscopy of Boron in Boron Neutron Capture Therapy Candidate Compounds*

**Dong Gon Park**

Professor J. Burlitch

*H<sub>2</sub>O<sub>2</sub>-Assisted Sol-Gel Syntheses of Forsterite (Mg<sub>2</sub>SiO<sub>4</sub>) and Metal-Doped Forsterite (M:Mg<sub>2</sub>SiO<sub>4</sub>, M=Cr, V, Ti.) and Electrostatic Spray Synthesis of Anatase (TiO<sub>2</sub>) Nano-Particles*

**Gomathi Ramachandran**

Professor G. Ezra

*The Dynamics of Ion-Neutral Collisions: The Role of Complex Formation*

**Duane Richard Smith**

Professor G. Morrison

*The Use of Secondary Ion Mass Spectrometry and Analytical Electron Microscopy for the Determination of the Distribution of Sulfur in Thin-Film Bicrystals of Iron-Sulfur Alloys with Small and Large Angle (001) Twist Boundaries*

**Harold Blair Wood, Jr.**

Professor B. Ganem

*Shikimic Acid and Its Cognate Biosynthetic Pathway: Synthetic Studies on Rationally Designed Inhibitors*

**May 1994**

**Demetrios Anglos**

Professor A. Kuki

*Photoinduced Intrapeptide Electron Transfer Involving Novel Donor and Acceptor Amino Acids: A Triplet State Approach*

**Jody Ellen Beecher**

Professor J. Fréchet

*Advanced Polymeric Coatings for Photopatterning and Second Order Nonlinear Optical Materials*

**En-Yuh Chang**

Professor B. Baird

*Studies of FcεRI-Mediated Signaling and Receptor Rotational Dynamics by Lipid Modulation and Phosphorescence Anisotropy Measurements*

**Eugene Kim**

Professor E. Kramer

*Studies of Diffusion, Thermodynamics, and Surface Segregation in Miscible Polymer Blends*

**Sanghyuk Lee**

Professor J. Freed

*Theory of Two-Dimensional Fourier Transform Electron Spin Resonance Spectroscopy*

**Sze-Ming Lee**

Professor J. Fréchet

*The Design and Chemistry of Novel Imaging Materials for Microlithography*

**Swee Kim Lim**

Professor A. Albrecht

*Time-of-Flight Mobility Experiments in n-hexane: Observation of Radical Cations and Anions, Dimer Radical Anions, and Charge Carrier Competition*

**Jinping Luo McCormick**

Professor J. Meinwald

*Total Synthesis of a Novel Disaccharide Nucleoside Isolated from the Venom of a Spider Hololena curta*

**James Christopher McWilliams**

Professor J. Clardy

*Synthesis of Mitochondrial Atpase Inhibitors and Enantioselective Total Syntheses of Octalactins A and B*

**J. Christopher Phelan**

Professor J. McMurry

*Studies Toward Synthesis of Digitoxigenin Via Transannular Cationic Cyclization of a Macrocyclic Precursor and Synthesis of Unsubstituted Calix[4]arene and Its Metal Complexes*

**Mary Alice Reppy**

Professor C. Wilcox

*Studies Towards the Syntheses of Cycloocta[1,2,3,4-def]-cyclobuta[6,7]biphenylene and Benzo[def]biphenylene*

**David Burgess Rydberg**

Professor J. Meinwald

*The Total Synthesis of Palasonin*

## Graduate and TA Awards and Fellowships



DuPont Teaching Prize winners, left to right: Julie Mueller, Charles Brandenburg, Greg Landrum, Glen Kowach, and Mark Harris

DuPont Teaching Prizes are presented annually by the Department of Chemistry to teaching assistants who have demonstrated excellence in teaching and the desire to upgrade the quality of undergraduate education. Graduate students who received the prize at a ceremony in February were **Charles Brandenburg, Mark Harris, Greg Landrum, Glen Kowach, and Julie Mueller.**

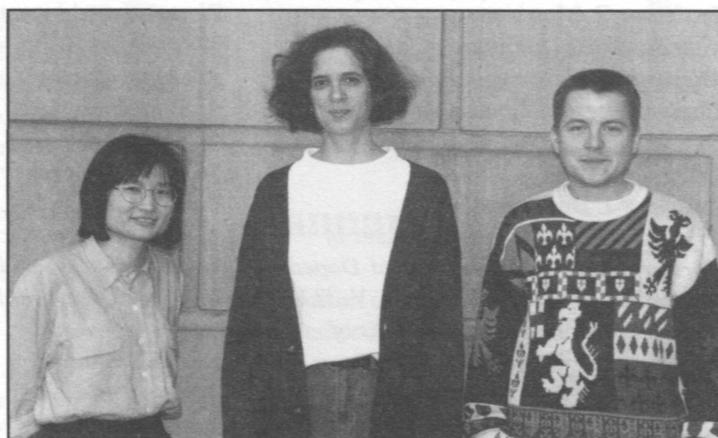
The **Howard Neal Wachter Prize** is awarded each year to a promising, outstanding graduate student in physical chemistry, taking into consideration the quality of the student's work and potential contribution to the profession. The prize was awarded in 1994 to **Avik Chatterjee.**



Richard Evans Prize winner Deborah Wilcox with Bruce Ganem

**Glen Kowach**, a third-year student in Professor DiSalvo's research group, was selected as a 1994 winner of the **Clark Teaching Award** for Teaching Assistants. Glen received his BA from the University of Wisconsin at Madison. His thesis project will involve the solid-state synthesis of nitrides. He was a teaching assistant for Chemistry 215/216. Glen is contemplating continuing research in industry or academia after the completion of his PhD.

Outstanding graduate students in any area of chemistry who have distinguished themselves both academically and in the quality and quantity of their research are awarded the **Tunis Wentink Prize**. This year's winners are **Angela Lee, Sara Perkovic, and Michael Senko.**



Wentink Prize winners, left to right: Angela Lee, Sara Perkovic, and Michael Senko.

### Richard Evans Prize 1994

The Richard Evans Prize is awarded when the faculty and students from introductory chemistry courses reach a broad consensus that there is a teaching associate who meets the high standards of service to the students set by the late Richard Evans. This year's honoree was **Deborah Wilcox**, a teaching associate for Chemistry 207.

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# Alumni News

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## 1941–1950

An announcement in the May 30 *Chemical & Engineering News* cites **Leo Mandelkern** AB '42, PhD '49, as winner of the 1993 Paul J. Flory Education Award for the ACS Division of Polymer Chemistry. Mandelkern is a member of the chemistry faculty at Florida State University. He and his wife, Berdie, established a prize at Cornell for an outstanding senior chemistry major who will go on to graduate study in chemistry or biochemistry (see Student News).

## 1951–1960

**Ellis Glazier**, AB '51 writes "When I left Cornell in 1951, my goal was to become part of academia after I got my PhD. Getting the degree at the University of Rochester did happen, but academia eluded me. Finally, after about 40 years and one retirement, I have been appointed a Professor of Chemistry, Department of Oceanology at Cicimar-IPN (Instituto Politecnico Nacional), one of the two major universities in Mexico. Cicimar is one of their degree-granting and research outposts in the country, in this case out in the boonies as far as Mexico City is concerned. I am able finally to start passing along some of the knowledge that I gained at Cornell, at Rochester and all the points between then and now. It has been difficult getting back into the swing of teaching, but I have been giving seminars here and at the Univ. Baja California Sur for the past year. Each time becomes easier."

We heard from **George B. Walker**, AB '52, who says he has been consulting for the past three years for WAYTEK of Springboro, Ohio. Walker, who has been elected to the company's board of directors and named Director of Development, says it's nice to feel needed at 75!

**John C. Howard** PhD '53, who lives in Augusta, Georgia, wrote with another example of Keith Shillington's wit: "At one of the 'ice sessions' described by Ellis Glazier in the April "Cornell Chemistry,"

a newly hired assistant professor was telling us of the new equipment that the department had authorized him, finally saying "they just gave me a carte blanche." "Well, said Keith, "that's better than NOTHING!"

A chemistry professor at Union College in Schenectady, New York, **Charles Scaife** AB '59, PhD '66 has used a six-month sabbatical to tour schools in the northeastern United States to demonstrate principles of science to elementary grade pupils. You may have seen the Wall Street Journal's "centerpiece" article about him.

## 1961–1970

**Horace A. Judson**, PhD '70, became the ninth president of the State University of New York College at Plattsburgh in January 1994. Judson had served as provost and vice president for academic affairs at California State University at Stanislaus, where he was also a professor of chemistry. He began his academic career as an assistant professor of chemistry at Morgan State University in Baltimore.

## 1971–1980

**Joe Weissman**, AB '74, is a member of the Department of Neurology at Emory University and spends much of his time doing in-vivo NMR spectroscopy studies in patients with neurodegenerative disorders.

**John Kevin Buchi**, AB '76, who was the senior director of finance and administration for Cephalon Inc. (a pharmaceutical products developer) has been appointed vice president for finance and administration. Congratulations!

**Peter S. Kim**, AB '79 and an associate professor at the Whitehead Institute at MIT, has been selected as the recipient of the 1994 Eli Lilly Award of the ACS Division of Biological Chemistry. Kim is recognized for his work in the field of protein folding. The award will be presented at the fall ACS national meeting in Washington, D.C.

## 1981–1990

The Charles E. Culpeper Foundation has named **Howard Worman, M.D.** Culpeper Foundation Scholar in Medical Science for 1994. Worman, who received his bachelor's degree in chemistry from Cornell in 1981, is an assistant professor of Medicine and of Molecular Biology at Mount Sinai School of Medicine in New York City. His research focuses on cell division in normal development and in cancer, by examining how proteins localize to the nuclear membranes and direct the disassembly and reassembly of the nucleus.

**Robert J. Hamers** PhD '86, an associate professor in the department of chemistry at the University of Wisconsin, Madison, has received the Peter Mark Memorial Award of the American Vacuum Society. Hamers was honored for "outstanding contributions to the development of scanning tunneling microscopy and spectroscopy as tools for quantitative analysis of the electronic properties of surfaces."

One of 169 scientists and engineers nationwide to win a National Science Foundation Presidential Young Investigator award was **Gae Montelione** PhD '87, who is an assistant professor of chemistry at Rutgers University.

**Douglas Hudgins** PhD '90, has a faculty position in the Chemistry Department of Adrian College in Michigan, and will begin teaching there this fall. Doug previously held a postdoctoral research position in the laboratory of Dr. Lewis Allamandola at NASA-Ames Research Center in Moffett Field, California, where he has been working in the area of Matrix-Isolation Infrared Spectroscopy.

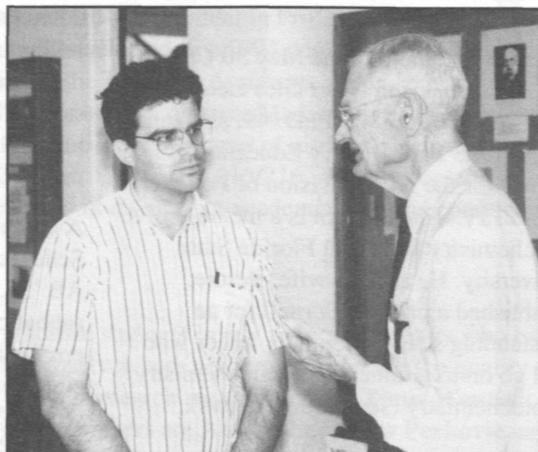
## —In Memoriam—

Martin Edward Panzer, AB '50, March 16, 1994.

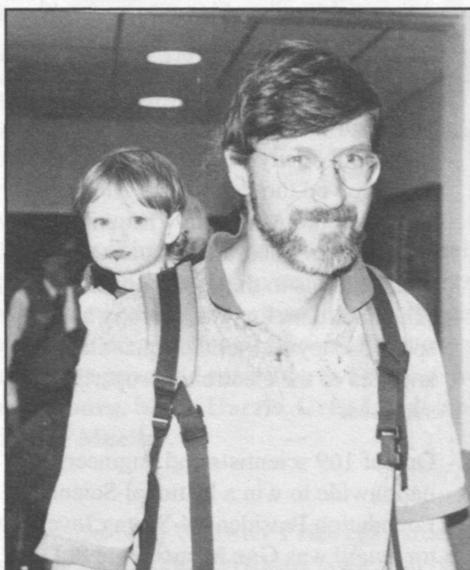
## Graduate and Reunion 1994 Fellowships

### Reunion 1994

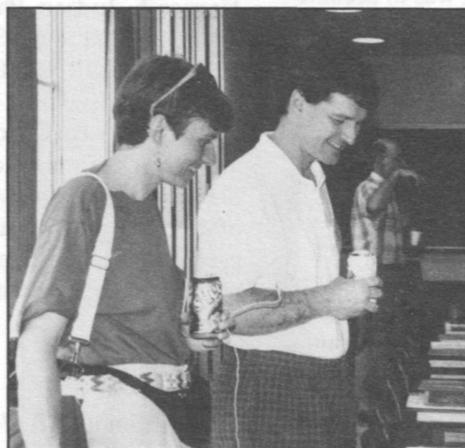
Although reunion weekend was pretty soggy this year, Friday, June 3, was a beautiful day, just right for wandering across the campus and stopping by Baker Lab to see how much things have changed. Not everyone came into the lounge to sign in, but we surely enjoyed talking with those who did! Guests included **L. Hastings Lyon** BChem '29, **B.V. Baus** PhD '50 (ChE), **Bruce Eisen** AB '59, **Sid Wolfe** BChE '59, **Margaret Bratley Mamet** AB '59, **Gerald R. Schultz, M.D.** AB '59, **Ken Asch** AB '69, **Lois Freeman Bennett** AB '74, **Mark Lipton** AB '74, **Charles Good** AB '79, **Camille Killey** BS '79, **Marty Putenis** AB '79, **Laura** (BS) and **Tim** (AB) **McCann** '79, **Peter M. Nalin, M.D.** AB '84, and **Martin McMillan** postdoc '87-88.



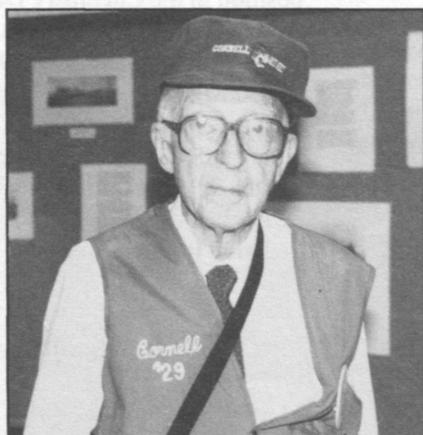
*Peter Nalin and Professor William T. Miller*



*Martin McMillan with his son, Payne.*



*Laura and Tim McCann look at reunion displays.*



*L. Hastings Lyon*



*Professor Ben Widom (middle) with Evelyn and Mark Lipton*

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## Faculty and Department News

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**J. Thomas Brenna**, PhD '82 and an Assistant Professor in the Division of Nutritional Sciences has been named a member of the graduate Field of Chemistry.



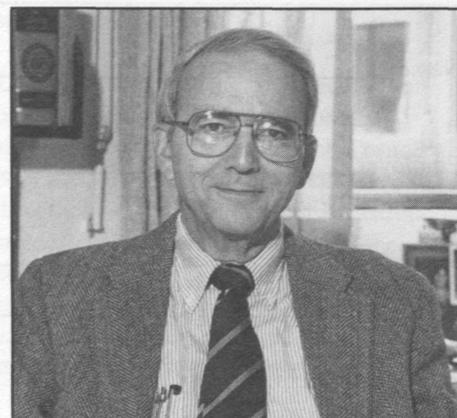
J. Thomas Brenna

**Jerrold Meinwald**, Goldwin Smith Professor of Chemistry, recently delivered the 1994 Max Rogers Lectures at Michigan State University. The Rogers Lecture

Series, formerly known as the Renaud Lecture Series, is one of the most prestigious in the United States, and lists several Nobel laureates among its distinguished speakers. Meinwald's lectures were titled *Recent Advances in the Chemistry of Insect Defense and Communication*, *The Chemistry of Everyday Insect Life: Violence, Sex and Drugs*, and *The Chemistry of Spider Venoms*.

Meinwald and his frequent research partner, Tom Eisner, organized a Colloquium in Washington, D.C., in March to highlight the activities of chemical ecologists. The Colloquium, sponsored by the National Academy of Sciences, was attended by an international panoply of scientists from many different disciplines. The lectures are to be published in the *Proceedures of the National Academy of Sciences*.

The Royal Netherlands Academy of Arts and Sciences has awarded Goldwin Smith Professor of Chemistry **Benjamin Widom**, the Bakhuis Roozeboom Medal 1994. The prize recognizes Widom's outstanding contributions to research in phase equilibria. Widom received the medal in Amsterdam last month during a special symposium.



Benjamin Widom

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### Fall 1994 Baker Lectures

*Supra Molecular Architectures of Polymers—Design and Properties* is the theme of Professor G. Wegner's lectures for the annual Baker Lecture Series. Lectures will be given on Tuesdays and Thursdays from September 13 through October 27. Dr. Wegner is a Professor at the Max-Planck-Institute für Polymerforschung in Germany.

### Fall 1994 ACS Meeting

If you're attending the ACS meeting in Washington, D.C., in August, please be sure you come to the Cornell Chemistry breakfast on Tuesday morning August 23 from 7:45–9:00 am in the Tokyo Room of the Marriott at Metro Center (formerly Holiday Inn–Crowne Plaza, located between G and H Streets). It is a free, nonticket event this year!

### Cornell Science Connection

If you're a regular reader of Cornell Chemistry, you know that students and staff get involved in many projects that promote chemistry education. In late April, the Society of Women Engineers held a two-day program to expose area high school women to engineering-related studies. As part of the program, chemistry graduate students **Maria Gelabert**, **Glen Kowach**, and **John Townsend** presented talks and demonstrations on general chemistry topics.

### 4-H Students Visit Campus

In June, Associate Director **John Terry** and several graduate students guided 24 teenagers from across New York State through three days of hands-on chemistry experiences ranging from "crystal growing" to "playing chemical detective." This was the fourth year the Department of Chemistry has been part of the 4H Focus for Teens program on the Cornell campus.

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## Cornell Chemists Career Survey

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### Dear Cornell Chemist:

I was recently asked by members of the Chemistry Club for a statistical career profile of the classes of 1983 through 1993. It turns out we have good information for only about 18% of the people who graduated as chemistry majors from 1983 through 1989. We know where everybody goes the first year following graduation, but then they get "lost in space!"

Please help us improve our statistical records by completing and returning the following survey. Thanks very much.

—Donna

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Name \_\_\_\_\_

Employer \_\_\_\_\_

Street Address \_\_\_\_\_

City, State \_\_\_\_\_

Your job title \_\_\_\_\_

Brief job description \_\_\_\_\_

Other comments \_\_\_\_\_

Are you interested in sharing career information with current undergraduate or graduate students at Cornell? (Y/N)

Are you willing to participate in an alumni panel discussion? (Y/N)

Are you willing to correspond with a Cornell chemistry student? (Y/N)

Are you willing to write an article for the Chemistry Newsletter? (Y/N)

If you have answered yes to any of the above, what is the best way to reach you during the day?

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## From the Chairman's Office

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Imagine a time when the federal government didn't fund scientific research. Unfortunately, quite a few scientists are beginning to know that feeling all too well again nowadays, what with the intensive competition for research grants at NSF and NIH, efforts to reduce the federal deficit, and the ongoing debate on Capitol Hill about the relative importance of basic and applied research.

But try to imagine a time when Washington spent almost no money on basic research. Actually, it wasn't so long ago when academic scientists relied on their own university administrations to provide modest resources for scientific work. Most of the research was concentrated on a few large campuses. Some lucky faculty members found sponsors at the state level, or benefactors in the private sector for individual projects. While foundations or philanthropic organizations gave small grants on a competitive basis, their intent was often to provide seed money, and not to establish big laboratories with long-term funding needs.

That's how academic science (i.e., basic science) operated until the late 1940s. Industrial research was strong, but heavily mission-oriented, and although the United States led the world in R&D spending, the emphasis was mostly on 'D', less on 'r.' Basic scientific research was always much more strongly supported in Europe.

With the onset of World War II, however, the government realized it needed scientists and engineers. It also realized that certain key scientific findings like the discovery of radar and penicillin could be of considerable strategic value. The Office of Scientific Research and Development was created to award contracts for such war-related research to scientists in universities, where discoveries could be pursued without product development concerns or other commercial pressures.

The steady stream of important technological discoveries (transistors, computers,

synthetic polymers, to name a few) that flowed from OSRD funding offered firm proof of principle that basic research could flourish in the university environment, to the great benefit of the country. In 1950, Congress created the National Science Foundation. Since then, Cornell has become one of the nation's largest recipients of NSF funds for basic research.

So what's changed? Why are federal funds for research so much more difficult to obtain? The country certainly needs scientists and engineers, although precisely how many is hotly debated. There are definitely more scientists competing for grants, but even in the post-war era, society still depends heavily on the discoveries of university researchers for new technological advances.

The answer is that universities have changed, in ways that, believe it or not, have gone largely unrecognized (and underappreciated) by American society. Universities are no longer just conglomerations of scholars lecturing to young people in college classrooms and conducting research projects on the side. Our educational mission has expanded greatly to include graduate and postgraduate students, summer and continuing education programs (including corporate management and executive training symposia), as well as public outreach programs and teacher training seminars, not just in our own communities but across the nation. All of these activities derive from research, in one way or another, and that research has become increasingly dependent on external (i.e., federal, corporate, private) support.

Many Cornell alumni might not recognize the university they attended thirty, even twenty years ago. Some of you may be unaware that the Chemistry Department at Cornell is involved in every one of the educational activities I just listed. In the last year, for example, we helped organize a 4-H Extension Program in Chemistry, and developed teaching and research

initiatives with the Norwich Middle School and Sidney High School, respectively. Some of my colleagues have taught ACS short courses, or served on national panels that review science policy, or addressed corporate CEOs on new and emerging industrial technologies. Two Cornellians (one a chemist) sponsored a National Academy of Sciences forum on the importance of chemical ecology in science and society.

University trustees, and sometimes even our administrators, are occasionally surprised by the extent to which Cornell's educational and research activities are directly linked to the growing industrial strength and economic security of the country. Is it any wonder even our own students are bewildered by the range of activities on campus that make up the scholarly enterprise of academic science?

Cornell is, indeed, a world-class university and a national treasure. However, that will be a hollow slogan echoing throughout empty laboratories, institutes, and research centers on campus if we and other university scientists don't act soon. It's imperative that we inform an interested and curious public much more clearly about what we do: about the faculty's many missions, about the inextricable link between teaching and research, about industry-university ties and collaborative research, about consulting and other outreach initiatives.

While attitudes are indeed changing in Washington about support for scientific research, a clear vision for the future of science in the United States seems to be absent. Leadership on this issue is sorely lacking. American research universities like Cornell could provide the voice of leadership, but we must earn that privilege. It is a challenge we cannot afford to let pass.

—Bruce Ganem

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