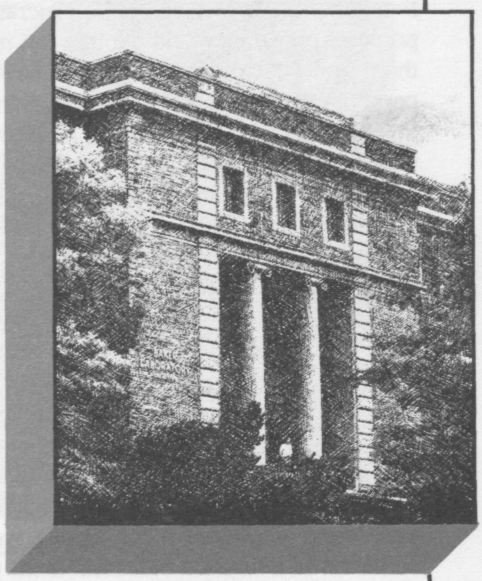
CORNELL CHEMISTRY



THE NEWSLETTER OF THE DEPARTMENT OF CHEMISTRY AND THE SOCIETY OF CORNELL CHEMISTS

Cornell University
Baker Laboratory
Ithaca, New York 14853

January 1986
Issue 36

Chairman's Column

In the last issue of *Cornell Chemistry*, Roald Hoffmann told you that he was stepping down as department chairman and kindly introduced me as his successor. Here, I have the opportunity to thank Roald, in the name of all Cornell chemists, past, present, and future, for his many efforts on behalf of us all. We are well aware of Roald's illustrious scientific achievements; I can tell you that he also applied his extraordinary skills to the administration of this office to strengthen and make more secure the framework upon which depends the future success of the department. Thank you Roald, and please stay close to the telephone because I have a lot of questions!

One question I can now answer is, "What, exactly, does the chairman do"? Having served on the job since the beginning of July, I have at least a rough idea. Surprisingly, there is relatively little routine paperwork to worry about. Most all of the administrative details are handled quite admirably by our efficient staff under the direction of Earl Peters, our Executive Director. He and I work closely together on a day-to-day basis; yes, one of my first acts in office was approving the *new* Chemistry Department dog ordinance. On an altogether different intellectual plane are some more interesting issues. How can we continue our long tradition of excellence in research, teaching, and service? How do we make available the resources required to make us even a stronger department?

In many ways, we stand at the threshold of the 21st Century. Decisions made now will affect the direction of our department for decades to come. In no area is this more apparent than in the continuous renewal of our department's most critical asset, the faculty. Here we are truly investing in the future, for the most productive and creative years of a chemist's career can span more than a generation. The current chemistry faculty numbers 28; during my time in office I hope to increase this to our full complement of 33. Given expected retirements, etc., we must bring to Cornell two new faculty members per year through 1990. Indeed, as the pace of retirements of senior faculty will increase in the '90's, we can probably anticipate that the rate of hiring will continue unabated through the end of the century. Now you understand where a large component of the Chairman's time is actually spent.

It will come as no surprise to most of you to learn that Cornell's need for outstanding teacher-scholars is not unique. Universities throughout the nation must begin to replace those faculty hired during the boom years of the post-Sputnik era; we can expect the competition for first-rate people to be intense. Even now, we estimate that the establishment at Cornell of ten new faculty research programs over the next five years will cost over $3,000,000! A (regrettably small) fraction of these funds will come from the university, but what of the remainder? Our traditional source of funding has been the federal government; we did quite nicely, thank you, in 1984-85 by attracting over $7,000,000 primarily from the National Science Foundation, National Institutes of Health, and various other branches of the government, as well as industry and

foundations. However, the bureaucratic burdens of proposal preparation and the like fall most heavily upon those junior faculty members who have not yet had an opportunity to establish their reputations as independent investigators or carry out those preliminary experiments which can help to prove the feasibility of a novel concept. Furthermore, it seems clear that an increasing fraction of basic research will, in future years, be funded by the private sector. How should we, as a department, respond to these demands and opportunities?

We believe that it has been the active encouragement and support of basic research which has established Cornell as an academic center for chemical science. In that supportive environment, both training and scholarship have flourished. Given our belief that a commitment to intellectual excellence is contagious, we are issuing an invitation to interested industrial firms to join us in the establishment of the *Cornell Chemistry Partnership* . The primary goal of this program is the support of junior faculty in starting their research activities; by short-circuiting the initial stages of the grant cycle, we hope to give them time to develop their ideas, attract students and do science!

Industrial Partners are being asked initially to commit $25,000 per year for three years. An Executive Committee consisting of Cornell faculty members and technical representatives of the Partners will select programs for funding from among brief proposals submitted by junior faculty and, to a lesser extent, more senior faculty members wishing to make a major change in the direction of their research activities. The selection criteria established by the Partners will encourage that research which will likely be of continuing long-term interest to industry, thereby enhancing the viability of Cornell research in areas of critical technological importance when our young investigators (of all ages!) achieve their maximum productivity.

I bring the *Cornell Chemistry Partnership* to your attention, because many of you are interested not only in the improvement of communications between chemists in industry and academia, but also the enhancement of America's scientific base in areas of likely technological exploitation. Please accept this invitation to learn more about the *Partnership* by contacting either Earl Peters or me. Of course, we would be delighted to receive your ideas concerning such programs of industrial/academic cooperation. Join us!

John Wiesenfeld

Faculty News

Harold J. Scheraga has been elected to Honorary Life Membership in the New York Academy of Sciences. This distinction is conferred on no more than one hundred fifty scientists who have achieved outstanding recognition for their work. Professor Scheraga was honored at the Annual Meeting of the New York Academy of Sciences on December 12, 1985, in New York City. In addition, he received the Linus Pauling Medal of the Puget Sound/Oregon sections of the American Chemical Society on October 26, 1985. This award is presented for outstanding contributions to chemistry of a character that have merited national and international recognition. In particular, Professor Scheraga was cited for his work on the folding of macromolecules and the structure of water and dilute aqueous solutions.

Fred W. McLafferty has been elected to the American Academy of Arts and Sciences. In addition, he received the Sir J. J. Thomson Medal for Mass Spectrometry, which was presented to him by the International Conference on Mass Spectrometry in Swansea, the United Kingdom. In October he received the Anachem Award from the Association of Analytical Chemists during the 12th annual Federation of Analytical Chemistry and Spectroscopy Societies in Philadelphia. That same month, the Cincinnati section of the American Chemical Society honored him with the Oesper Award for contributions to Chemistry of historical significance. Professor McLafferty is recognized for his outstanding work in the application of mass spectrometry to the structural elucidation and analysis of organic molecules.

Bruce Ganem recently received an American Cyanamid Corporation Award in recognition of his excellence both in research and in training young chemists in the field of organic synthesis. Only six such awards were presented this year.

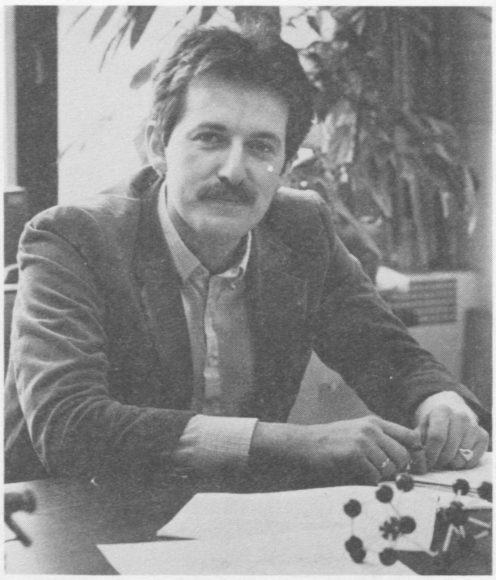
Paul Houston and **Barry Carpenter** were promoted to the rank of Full Professor. Articles on their research appeared in Issues 35 and 34 of the Cornell Chemistry Newsletter, respectively.

Melvin J. Goldstein has resigned his position on the faculty and joined an industrial firm in Israel.

John McMurry and **Jon Clardy** have been elected Fellows of the American Association for the Advancement of Science.

Research at Cornell Chemistry

An understanding of chemical catalysis by transition metals, in both homogeneous and heterogeneous systems, is part of the foundation on which new chemical technologies must be developed. The research group of **Klaus Theopold** is exploring the synthesis and characterization of organometallic molecules and materials which model intermediates in catalytic cycles.

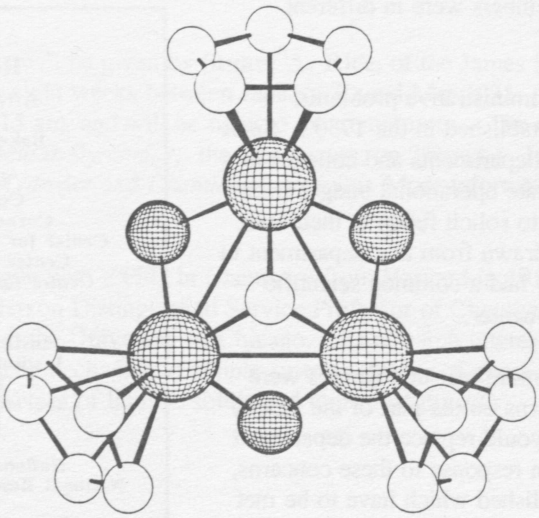


Klaus Theopold

Inherent to catalysis is the high reactivity of intermediates along the reaction path. To model such species is to turn away from the familiar hallmarks of stability and to search instead for organometallics in unusual oxidation states and with electronic configurations which violate the 18 electron rule.

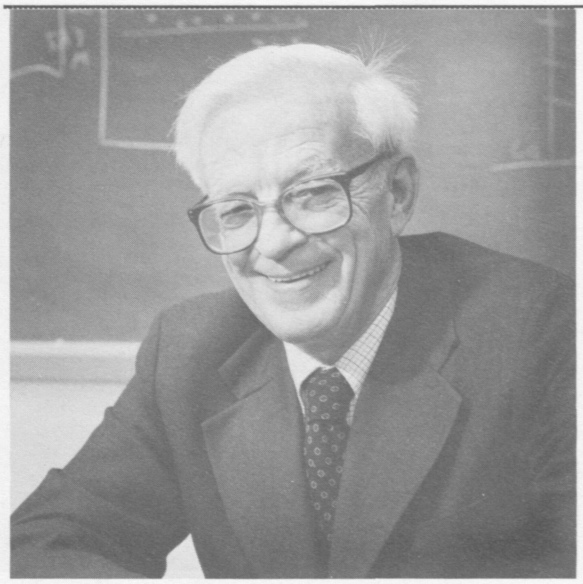
One example of this approach is the study of **electron transfer processes** occurring between homoleptic alkyl complexes of Co(II) and Co(IV). The importance of rapid redox reactions in organometallic chemistry is only now being fully recognized, and this work will further our understanding of the effects of electron transfer reactions on the reactivity of transition metal alkyls. Reaction of $CoCl_2$ with 1-norbornyllithium produces a paramagnetic Co(II)-alkyl ($[Li(THF)_2]_2^+[Co(1\text{-norbornyl})_4]^{2-}$) which may subsequently be oxidized to a Co(IV) complex with an electron count of 13! There is no evidence for the intermediacy of Co(III) in this oxidation. Indeed, all experiments suggest that this common oxidation state of cobalt is thermodynamically unstable for these compounds. The degenerate exchange of 2 electrons between Co(II) and Co(IV) was studied by NMR-spectroscopy and shown to be fast on the time scale of this technique at room temperature. Studies are now in progress to determine the reasons for this peculiar behavior.

Another group of compounds under investigation are some **electron deficient** alkyl chromium(III) **clusters**. Consider the thermal reaction of dimeric $[(\eta^5\text{-cyclopentadienyl})Cr(Cl)(CH_3)]_2$ which yields hydrocarbons like methane, ethane, and ethylene as well as a trimeric chromium cluster which is capped by a triply bridging CH-fragment (see figure). This reaction models the interaction of saturated hydrocarbon fragments with the electron deficient metal atoms on the surface of a heterogeneous catalyst. The reversible activation of carbon-hydrogen and carbon-carbon bonds taking place in such an environment is intriguing from a mechanistic viewpoint and of obvious utility.



Trimeric Chromium Cluster capped by a triply bridging CH-fragment.

Bridging the gap between organometallic and solid state chemistry is some research in Dr. Theopold's group aimed at synthesizing **organometallic intercalation compounds.** Introduction of transition metal alkyls in the van der Waals gap of solids with layered structures produces novel materials which may exhibit shape selectivity in stoichiometric or catalytic reactions. Such compounds can also be used to produce novel inorganic solids inaccessible with more traditional synthetic techniques.



W. D. Cooke

Research Centers at Cornell

In the past three decades there has been a gradual change in the nature of scientific research. More and more scientists are crossing departmental lines and research is assuming a greater interdisciplinary character.

In the early 1950's, scientific research was simpler than it is today because it was largely self-contained within the various disciplines. But, during that decade, as scientists probed more deeply, it became apparent that many answers to important aspects of the effort spilled over to other disciplines and a broader expertise had to be brought to bear on the problems. This situation introduced the era of interdisciplinary research. In those times administrative problems arose from the nature of the isolated academic departments. It was difficult to handle joint proposals by faculty members from different departments and even more difficult when the faculty members were in different colleges in the university.

To alleviate some of those administrative problems, research centers were first established in the 1950's. Such centers were independent of departments and colleges in a fiscal sense; they had a separate operational budget from the university and were able to solicit funds in their own right. The faculty could be drawn from any department in the university as long as they had a common scientific interest in the mission of the center.

At Cornell, in the 1960's, as more research centers were established, there were concerns on the part of the faculty in general that such centers would replace the department structure of the university. In response to these concerns, certain conditions were established which have to be met before a center which crosses college lines can be authorized. First, there must be a significant number of faculty members to justify the initiation of the effort. Secondly, the usefulness of the center to the interested faculty and to the university has to be approved by the entire University Faculty and the Board of Trustees. In addition, research centers cannot make tenured faculty appointments, The latter provision was seen as a hedge against the evolution of science and the possibility that any narrow area of science could go out of style. (In fact, two such research centers have been disestablished). As a result, each research center is an administrative unit with a group of interested faculty and students from various departments across the University, a research staff of its own and a research budget primarily, but not totally, from external funds.

The formation of the Materials Science Center, in the early 1960's, marked a significant change in policy for the University. Previously, research centers were established with the provision that the organization would be totally self-supporting with no commitments from the University. In the case of the Materials Science Center, Cornell made a major commitment to substantially increase the number of faculty members and graduate students in the area of Materials Research. This major decision on the part of the University changed the view of the administration and the Trustees toward research centers and their role in the University.

In the 1950's there were two research centers at Cornell. There are now over 20 research organizations which are fiscally independent of the academic departments and which have more than 600 affiliated faculty members.

Currently, more than one half of the research funds in the non-Statutory units of Cornell has its origin from research centers. There is every indication that, at Cornell, this fraction will increase substantially over the next few years.

W.D. Cooke

Research Centers at Cornell

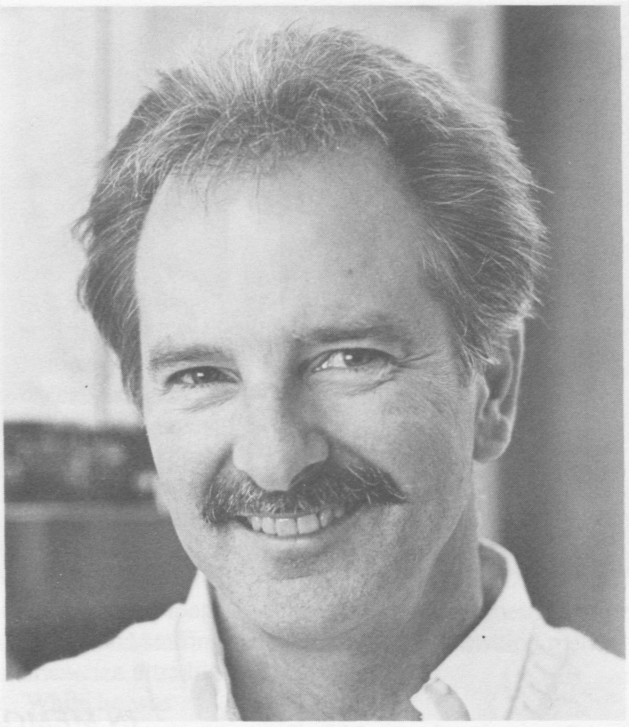
Africana Studies and Research Center
Applied Mathematics Center
Baker Institute for Veterinary Research
Biotechnology Institute
Center for International Studies
Center for Environmental Research
Cornell High Energy Synchrotron Source
Center for the Study of American Political Economy
Center for Radiophysics and Space Research
Center for Theory and Simulation in Science and Engineering
Computer Graphics Program
Institute for the Study of the Continents
Institute for Social and Economic Research
Laboratory for Nuclear Studies
Laboratory for Atomic and Solid State Physics
Laboratory for Plasma Studies
Materials Science Center
National Astronomy and Ionosphere Center
National Research and Resource Facility for Submicron Structures
Program on Science, Technology and Society
Society for the Humanities

DEBYE LECTURES

The Debye Lectures for 1985 were given by Robert J. Madix, Professor of Chemical Engineering and Chemistry and Chairman of Chemical Engineering at Stanford University.

Professor Madix received his BS degree in chemical engineering from the University of Illinois in 1961 and his PhD from the University of California in 1964. Following a post-doctoral year at the Max Planck Institute for Physical Chemistry in Goettingen, Germany, he joined the faculty at Stanford.

Professor Madix received the Emmett Award for fundamental studies in catalysis from the North American Catalysis Society in 1982 and was a Humboldt Senior Scientist at the University of Munich in Physical Chemistry in 1978. His research interests concern the fundamentals of reactive processes on transition metal surfaces. Recently his work has focused on the identity and structure of reaction intermediates. He has pioneered transient methods for the study of complex reactions on single crystal surfaces with characteristic times from ten to 10-5 sec. He serves on the editorial boards of *J. Phys. Chem., Langmuir, Int. J. Chemical Kinetics* and *Catalysis Reviews.*



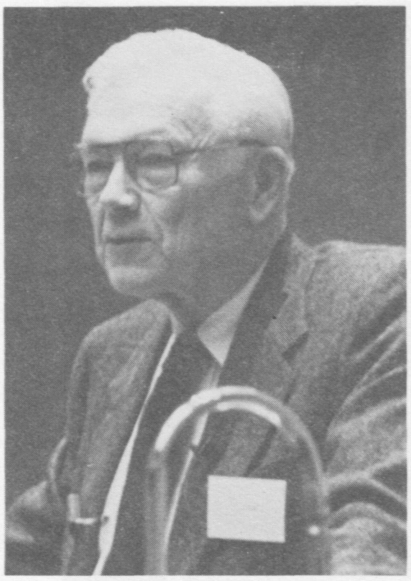
R. J. Madix

The three lectures, given on October 7, 8 and 9, were entitled "Heterogeneous Oxidation of Organic Metals: A Paradigm for Synthesis of Surface Compounds," "Reaction Kinetics and Dynamics on Single Crystal Metal Surfaces," and "Structure and Identity of Surface Complexes."

Baker Lecture Series

The 1985-86 Baker Lecture Series will be given by **Stuart A. Rice**, of the James Franck Institute, University of Chicago, during the eight weeks between January 30 and March 21. The lectures will be held on Tuesdays and Thursday at 11:15 am, and will be open to the community. The overall theme for the sixteen sessions will be *Intramolecular Dynamics;* the first lecture, on Thursday, January 30, is entitled *Controlling Selectivity in Energy Transfer and Chemical Reactivity.* More information on the lecture series is available at 256-4174.

Dr. Rice's distinguished career began with a PhD in Chemistry from Harvard in 1955, and has led to his present positions as the Frank P. Hixon Distinguished Service Professor of Chemistry and Dean of the Department of Physical Sciences at the University of Chicago. His research interests have included the statistical theory of matter, statistical mechanics of simple systems, theory of phase transitions, photochemistry, and electronic structure of liquids, solids and molecular crystals.



IN MEMORIAM

PAUL J. FLORY

1910-1985

It is with sadness and a great sense of loss that we report the death of our friend and former colleague, Paul J. Flory.

Paul was an outstanding scientist, a pioneer in a very difficult scientific discipline, who found simple solutions for complex problems. He almost single-handedly developed the fundamentals of the physical chemistry of polymers, many of which were so well expressed in his classic Baker Lectures book.

He began his studies of Polymer Chemistry under Wallace H. Carothers at du Pont in 1934, where he introduced mathematical and physical concepts to understand chemical reactivity. His first work on condensation polymerization was followed by his explanation of addition polymerization, and the origination of the concept of chain transfer. All of these theoretical considerations were subsequently

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HAROLD J. MATTRAW

1915-1985

Harold C. Mattraw, 69, died of heart failure at Ojai, California, July 8, 1985. As a graduate student at Cornell from 1946 to 1950, and as Executive Director of our Chemistry Department from 1971 to 1977 he made a host of Cornell friends who are saddened by his death.

Born in Pulaski, New York, Harold received his BS from the University of Alabama in 1939 and went on to research at the Tennessee Valley Authority. He was an Ordnance Officer in the US Marine Corps from 1944 to 1946. Harold then came to Cornell for graduate study, majoring in Inorganic Chemistry with me and minoring with Professors Nichols and Blomquist. Having been out of college and in military service, and as a married teaching assistant with a number of children, he had a rugged time his first year. But he soon got into stride and eventually turned out to be one of my top graduate students and a fine teaching assistant.

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EARL MUETTERTIES

1927-1984

When Earl Muetterties died on January 12, 1984, the loss to our world was acute. His family and friends felt most deeply the departure of a loved one and a warm personal friend. We at Cornell lost a colleague who was with us only a few years, but who changed the Department's stature in inorganic chemistry, and who strongly affected our own image of this field, and the world of science marked with sorrow the passing of an unusual man. For Earl Muetterties was not just a scientist with substantial achievements in one field of our enterprise, but a unique creator of molecules and integrator of ideas; a person whose interests spanned all of chemistry, and who changed the patterns in which we think about our science. By bridging in his own career the industrial and academic worlds as well, he also provided us with a salutary example of how these two parts of the chemical world do and must interact.

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FLORY, CONT.

confirmed by experiment. His stay at du Pont was followed by successive ones at the University of Cincinnati, Esso and Goodyear, where he developed theories of gelation through formation of infinite networks, of the thermodynamic properties of polymer solutions (treated simultaneously and independently by M.L. Huggins), of rubber elasticity, of crystallization in polymers, and of the frictional properties of polymers.

In the spring of 1948, at the invitation of Peter Debye, Flory delivered the Baker Lectures, and his first book ("Principles of Polymer Chemistry", based on these lectures) served to educate a generation of polymer chemists. In the Fall of 1948, he joined our faculty and added to the polymer ferment created by Debye and Kirkwood. During his Cornell period, he and his students (primarily Tom Fox, Bill Krigbaum and Leo Mandelkern) provided experimental evidence to favor Flory's hydrodynamic theories over those of Debye and Kirkwood, and developed theories of the swelling of network structures, and the role of cross-linking therein, of phase equilibria in polymers, and of elastic mechanisms in fibrous proteins.

Flory left Cornell in 1957 and, after a brief sojourn at Mellon Institute, spent the remaining years of his life at Stanford. It was there that he turned his attention to the conformations of natural and synthetic polymer chains, summarized in his second book, "Statistical Mechanics of Chain Molecules." In this effort, he was able to account for many macroscopic properties of chain molecules in terms of interaction potentials between their constituent atoms and connectivities. His other recent contributions have further

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MATTRAW, CONT.

Matt's subsequent career was unusually varied, demonstrating his exceptional ability, innovative managerial skills, and fine personality. He first joined a large number of Cornellians at the General Electric Company in Schenectady where, as Manager of the Knolls' Atomic Power Chemical Laboratory, he organized analytical research for nine years. For three years he was associated with General Electric's Technical Military Planning Operation. At Sperry Rand Research Center he developed long range plans, equipment, and staffing to prepare and characterize ultra high purity materials. While he was associated with the Autonetics Division of North American Rockwell, he directed development of electronic materials.

In 1971 Mattraw returned to the Chemistry Department as Executive Director. He served in that capacity until 1977. Harold's warm, friendly personality brought him a very effective association with faculty, students, and non-academic staff, and his attractive wife, Afra, was a most welcome addition to our community.

The Mattraws retired in 1977 to a fine community at Ojai, California. When Grace and I visited them in 1979, Harold had established a reputation as a fisherman and was busy carving and painting wooden decoy ducks.

We will miss Harold's warm friendship; we sympathize with Afra and her family. A scholarship fund in Harold's name has been established by his friends at Cornell Chemistry. Those wishing to contribute in his memory should contact the present Executive Director, Dr. Earl Peters.

A.W. Laubengayer
Professor of Chemistry
Emeritus

MUETTERTIES, CONT.

At du Pont, Muetterties synthesized most of the polyhedral borane anions in the $B_nH_n^{2-}$ series, and explored the great derivative chemistry of these molecules. These are interesting compounds in their own right, but they also were and are important in the general evolution of modern inorganic chemistry. Thinking about their stability led others to the development of simple computational methods for non-planar molecules, and, later, to important systematizations of the electronic and geometrical structures of polyhedral transition metal clusters.

Earl Muetterties pioneered the application of NMR spectroscopy to the elucidation of the dynamics of intramolecular rearrangements and reactions. The specific applications that he and his able coworkers made to phosphoranes, boron hydrides and transition metal complexes were pioneering studies, but I think more important was the firm notion that Muetterties implanted in the collective mind of the chemical community of the time scale of different molecular transformations, and of the appropriateness of using different physical methods characteristic of different time or energy regimes. He also left us with a sense of the wide range of molecular motions, a better feeling for the meaning of conformation and isomerism, and an appreciation of the beautiful sterochemical complexity of then unfamiliar coordination geometries such as five, seven or eight coordination.

It is interesting that it was only after leaving the supportive industrial environment of du Pont for Cornell that Muetterties began to work on problems of catalysis. His was a many-sided approach: it included the

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FLORY,CONT.

advanced our understanding of polymer crystallization, of rubber elasticity, and of the behavior of liquid crystals.

Paul received numerous honors for his outstanding work, including the Nobel Prize for Chemistry in 1974.

Besides training many students who have gone on to independent careers in Polymer Chemistry, Paul was very active in developing educational opportunities and communication media in polymer science, not the least of which was the founding of the ACS Journal, "Macromolecules."

Paul was not only a great scientist but a wonderful human being. His long-standing courageous devotion to the cause of Human Rights made life easier for many oppressed scientists, and raised the hopes of many more by showing that there were people like Paul who cared about their well-being.

Paul was a colleague and loyal friend whose association with the Cornell University Department of Chemistry continued long after he left Ithaca, most recently as a participant in the Debye 100th Anniversary Celebration in the Spring of 1984. We are grateful that we were privileged to know him.

H. A. Scheraga
Todd Professor of Chemistry

MUETTERTIES, CONT.

study of many important homogeneous organometallic reactions such as the reduction of coordinated arenes, the study of interconversion of different bonding modes of complexes, the use of low valent phosphite complexes, the reactivity of clusters, especially those containing carbide atoms. Finally, at Berkeley, he undertook a concerted effort to bring homogeneous solution chemistry and surface physics together by studying the details of bond breaking and deformation of molecules adsorbed on clean surfaces.

What is unique and so typical of Muetterties in all his work is the wide range of chemical and physical techniques that he could and did bring to bear on these problems, and the fact that in each area that he entered the ideological impact of his work strongly affected the community of chemistry. Let me be a bit more specific. Transition metal cluster chemistry was in flower before Earl's contributions, and others have shown us in more detail than he did how molecules break and reform on, for instance, trinuclear clusters. But that molecules should or might do so, that a cluster might provide reaction channels different from those of a mononuclear complex, that we should worry about the possibility of cluster decomposition in its reactivity, and that we should think carefully of the ways in which a cluster does or does not approach a surface - - these questions, the way that we think about clusters - - all of these were influenced in a fundamental way by Muetterties. He and his coworkers did it by working out a crucial case here, by a pedagogically effective presentation there, by writing comprehensive and perceptive reviews. His legacy is a web of ideas, patterns and understanding that permeates modern inorganic chemistry. This great experimentalist made us *think* about molecules and their transformations in different and effective ways.

CONTINUED IN NEXT COLUMN

I want to add some observations about Earl Muetterties at Cornell. We all expected him to be a great scientist, and to lead Cornell's advance to the fore in inorganic chemistry. What we did not anticipate, given his industrial background, was his true interest, indeed love, for teaching. Earl was not a natural teacher like Mike Sienko. But he took an extraordinary interest in the educational process. He volunteered for introductory courses, he rehearsed his lectures, he agonized about the curriculum, he spent a great amount of time on a faculty committee on general education. It was an impressive commitment to the new world around him, and it added so much to the collegiality of the Department.

Cornell misses a great scientist who also cared for teaching. In the few years he was here he left his mark on the Department and on his colleagues.

R. Hoffmann
John A. Newman Professor
of Physical Science

LAUBY'S RECOLLECTIONS

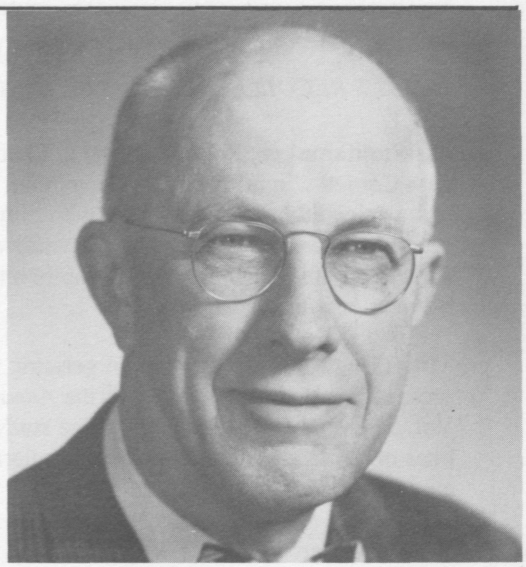
Our Chemistry Open House for chemistry alumni returning for the June 1985 Cornell Reunion weekend gave alumni a chance to renew friendships with faculty and meet graduate students and research associates. John Piscopo provided tempting snacks, punch, tea and coffee.

Victor Chalupski, BChem '25, set the record for earliest alumnus attending. After an active career he lives in Jamesburg, New Jersey. The Class of 1935, celebrating its 50th Cornell Reunion, accounted for the largest number of our returnees: **Addison N. White, Carl Z. Berry, Ellison Taylor, John Schmid,** and **Anne S. Van Campen. Art Newkirk**, BChem '36, PhD '40, made good on his promise to come to help his wife Kay celebrate her 50th, and then go birding in Alaska. Among others were **Mary Schuster Jaffe,** BA '37, **Karl Pechman,** BChem '38, **Jerry Panzer,** PhD '56, **Ginny Wallace Panzer,** '55, **A. Bruce King**, PhD '57, **Marty Gorman King,** '55, **Ellis Hormatz**, PhD '50, **Donald W. Marshall**, AB '58, **Ralph R. Miano**, PhD '60, and **Margaret Miano**, AB '60, MS '61, and **Ralph Wise**.

Other alumni have visited at other times or have written to renew contact. **J. David Smith,** who came from Cambridge University to me as a postdoc associate in 1958, is having a distinguished career as Professor in the School of Chemistry and Molecular Sciences, University of Sussex, at Brighton, England. David and his wife Marian travelled in the US in April 1985 for meetings and giving invited seminars. Grace and I were delighted to have them with us for a few days. David was pleased to talk with Professor Robert Fay, who had been on sabbatic leave at the University of Sussex recently.

It is most pleasant to have **Bob and Mary Plane** retire from the Presidency of Clarkson to their extensive Cayuga Vineyard and Winery on the west shore of Cayuga Lake some 23 miles north of Ithaca. Operating as a Farm Winery, they have an attractive tasting and sales room, which is a popular stop in the Cayuga Lake Wineries Tour.

Bob Ehrenfeld, PhD '48, has sent a fine contribution to our historical collection of books written by Cornell Chemistry faculty, a "Laboratory Manual" published in 1902 by L.M. Dennis and F.W. Clarke to accompany



A. W. Laubengayer

their text,"Elementary Chemistry." Bob's daughter, Betsy '81, found the Manual in an old desk she bought downtown to furnish her senior year apartment. This Manual has notes written for the experiments performed by a student, J.D. Blanchard. Thanks, Bob. If any of you come across other chemistry books written by Cornell faculty we will be pleased to obtain them for our historical collection.

Errett H. Callahan, BChem '27, wrote to comment on the picture of the 1927 Chem. Crew picture in Issue 35. Callahan rowed on the Cornell Varsity crew at that time and is anxious to get in touch with **Roger Sutton** to recall rowing lore.

Worden Waring, BChem '36, looks forward to his 50th reunion. He is particularly interested about the background for the Caldwell Prize for scholarship which he was awarded when he graduated. I will see what is available. Waring recalls the Advanced Inorganic course and sample of germanium I exhibited, "especially significant when I went into the semiconductor industry in its early years."

Irving Bernstein, PhD '51, is Assistant Director of Research Program Development for the Division of Health Sciences and Technology, Harvard-MIT. He also has formed Hygeia Sciences, Inc., which develops and manufactures over-the-counter diagnostic kits for home use, and Analytic Inc., which is developing a microprocessor based on whole blood chemistry analyses for ambulatory clinics and hospitals.

El Wannamaker, PhD '35, came to Ithaca on business with Cornell administrators in September. Grace and I had a splendid luncheon reunion with him, recalling the years when we shared so many activities with El and his attractive wife, Angie Ray. He promises to bring her on his next visit to Ithaca.

Mike Hughes, PhD '30, now in geriatric research as a professor at USC, has a paper in the *Annals of Allergy*, Vol. 55, Number 1, July 1985. The study gives two lines of evidence which indicate that migraine has an etiology of food sensitivity.

Bob Zoellner, a Postdoc with J. Burlitch in '83-84, has moved his family to Flagstaff, Arizona, where Bob is an assistant professor in the Department of Chemistry.

Seymour Geller, PhD '49, is a professor of Electrical Engineering at the University of Colorado at Boulder. Two years ago he received a National Science Foundation Creativity Award.

Bob Whetten, PhD '84, who is now on the faculty at UCLA, was recently named the student recipient of the ACS Nobel Laureate Signature Award for Graduate Education in Chemistry, along with his mentors, **Gregory S. Ezra** and **Edward R. Grant**.

Cynthia J. Burrows, PhD '82, **Greg Gellene**, PhD '83 and **David Hoffman**, PhD '82, have received grants under the Cottrell Research Program. Cynthia is now at SUNY Stony Brook, Greg is at the University of Notre Dame and David is at Harvard.

Recently announced Fulbright Scholars are **Jack Crandall**, PhD '63 and **Vernon J. Shiner**, PhD '50, now at Indiana University, and **Robert B. Vondreele**, PhD '71, of Arizona State University.

A. William Johnson, PhD '57, wrote to tell us of his new address in Grand Forks, North Dakota, where he is Dean of the Graduate School at the University of North Dakota. Bill spent three years at Mellon Institute after receiving his PhD, then joined the Chemistry Department at North Dakota. Among the many interesting things he has been doing was a two-year stint organizing and directing the Regional Environmental Assessment Program for the State of North Dakota from 1975 - 1977.

Georgia Thomas Fritz, who now works at Los Alamos National Laboratory in New Mexico, sent some classic photos of Halloween skits and square dances from 1958 and 1959. Can you identify the merrymakers in these scenes?

A

B

C

PhD GRADUATES SEPTEMBER 1984 - OCTOBER 1985

In chronological order of completion of the requirements for the degree

Jean A. Cognet		Ferrand, France
Catherine J. Page	E. I. du Pont de Nemours	Wilmington, DE
Leslie Schwartz	Assistant Professor	St. John Fisher College
Douglas Stauffer	Postdoc with F. McLafferty	Cornell University
Shen-Shu Sung	Postdoc with P. Jordan	Brandeis
Chia-Yu Teng	Postdoc with R. Danheiser	MIT
Mark Erion	Postdoc with C. Walsh	MIT
Charles A. McWherter	Monsanto	St. Louis, MO
Lloyd Steven White	Universal Oil Products	Des Plaines, IL
Carl Nicholas Hodge	E.I. du Pont de Nemours	Wilmington, DE
Jim Barren	General Electric	Schenectady, NY
Ian Watson	Eastman Kodak	Rochester, NY
Robert Hamers	IBM: Watson Research Labs	Yorktown Hgts, OH
Eric Bell	Eastman Kodak	Rochester, NY
Karl Weber	Postdoc with M.A. Fox	Univ. of Texas, Austin
Tom Adams	AT&T	Allentown, PA
Tom Brenna	IBM	Endicott, NY
Paul Danis	Postdoc	Univ. of Basel, Switzerland
Greg Haley	Ayerst	Princeton, NJ
Bob Jacobs	Postdoc	Univ. of Illinois
Kathy Plavcan	Postdoc	Johns Hopkins University
Doris Kimbrough	Lederle Labs	Pearl River, NY
Frank Liotta	Arco	Philadelphia, PA
Anant K. Menon	Postdoc with G. Cross	Rockefeller University
Glenn Millhauser	Postdoc with R. Oswald	Vet School, Cornell
Akbar Nayeem	Postdoc with S.I. Chen	CalTech
Robert Wanat	Rohm & Haas	Bristol, NY

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A. C. Albrecht
B. A. Baird
J. M. Burlitch
B. K. Carpenter
J. C. Clardy
D. B. Collum
W. D. Cooke
G. S. Ezra
R. C. Fay
M. E. Fisher
J. H. Freed
B. Ganem
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R. Hoffmann
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*Visiting

**On Leave

Emeriti

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