UNIVERSITY OF UTAH

History of The Chemistry Department

Part 1: 1946-2000, Written by: Edward M. Eyring / Assisted by: April K. Heiselt & Kelly Erickson

Part 2: 2000-2014, Written by: Edward M. Eyring / Assisted by: Heather Burkart

The Chemistry Department

1946-2000

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Henry Eyring and the Birth of a Graduate Program

In January 1946, Dr. A. Ray Olpin, a physicist, took command of the University of Utah. He recruited a number of senior people to his administration who also became faculty members in various academic departments. Two of these administrators were chemists: Henry Eyring, a professor at Princeton University, and Carl J. Christensen, a research scientist at Bell Laboratories.

In the year 2000, the Chemistry Department attempts to hire a distinguished senior faculty member by inviting him or her to teach a short course for several weeks as a visiting professor. The distinguished visitor gets the opportunity to become acquainted with the department and some of the aspects of Utah (skiing, national parks, geodes, etc.) and the faculty discover whether the visitor is someone they can live with. The hiring of Henry Eyring did not fit this mold because he was sought first and foremost to beef up the graduate program for the entire University rather than just to be a faculty member in the Chemistry Department. Had the Chemistry Department refused to accept Henry Eyring as a full professor, he probably would have been accepted by the Metallurgy Department, where he had a courtesy faculty appointment for many years.

Sometime in early 1946, President Olpin visited Princeton, NJ, and offered Henry a position as the Dean of the Graduate School at the University of Utah. Henry was in his scientific heyday having published two influential textbooks (Samuel Glasstone, Keith J. Laidler and Henry Eyring, The Theory of Rate Processes, McGraw-Hill Book Co., New York, 1941; Henry Eyring, John Walter and George E. Kimball, Quantum Chemistry, John Wiley & Sons, New York, 1944) and having recently been elected to the National Academy of Sciences. Henry respectfully declined the job offer. The next day his wife, Mildred Bennion Eyring, told him that she and her three sons were moving back to her home in Utah with or without him. Henry quickly decided to accept the $8,000 per year job at The University of Utah, and he and his family arrived for work in Salt Lake City late in the summer of 1946.

At the time of Henry's arrival The University of Utah already had a strong undergraduate program in chemistry. Thus, Henry Eyring's principal impact within the department over the next few years was on the graduate research program, which was less mature. James M. Sugihara successfully defended the first Ph.D. degree dissertation in Chemistry at the University of Utah in August 1946. Dr. Sugihara and Dr. Marilyn Alder Marquis, mentioned later in this narrative, were honored in fall of 1997 at a 50th anniversary event for University alumni. Dr. Sugihara's Ph.D. was one of the first two Ph.D.'s granted at the University; the other recipient that year was Ewart Swinyard who later became the Dean of Pharmacy. As of the year 2000, the University of Utah has granted over 675 Ph.D.'s in Chemistry. At the end of this narrative, the reader will find the names of the students who earned these Ph.D.'s, along with the year they earned their degrees. Back in 1947, Sugihara's 84-page dissertation on "The Reactions of Mercaptans with Sucrose and Molasses" included only three approval signatures: Walter D. Bonner, Lloyd E. Malm and Elton L. Quinn. All three were faculty members in the Chemistry Department. Yet, in this dissertation there is not a signature from the Dean of the Graduate School because there was not a Dean by that date.

A hallway in the old Physics/Chemistry Bldg. (ca. 1950) that has since become the John Widtsoe Mathematics Bldg.

In his first ten years at The University of Utah (1946-1956) Henry provided a lot of stimulation to the graduate research program in the Chemistry Department. His own lively research program made the department more attractive to like-minded Ph.D. chemists such as Bruno Zwolinski, Ransom Parlin, Rufus Lumry, Bill Cagle and Austin Wahrhaftig, all of whom joined the faculty and engaged in active research programs. In those first ten years Henry also attracted many gifted graduate students to his research group such as Tracy Hall, Cal Giddings, George Blyholder and Art Ruoff who went on to successful post-Ph.D. careers in academe.

Federal funding of university research increased substantially during this ten-year period that immediately followed World War II. Austin Wahrhaftig, for example, built a strong experimental mass spectroscopy research program at The University of Utah with funding from the Atomic Energy Commission, which later became the Department of Energy. One of the high-impact, scientific publications that came out of the Chemistry Department at this time, was co-authored by H. Rosenstock, M. Wallenstein, A. Wahrhaftig and H. Eyring [Proceedings of the National Academy of Science U.S. 38, *667* (1952)]. This paper reported a statistical theory of the break-up of large molecules after ionization and excitation by electron impact. Henry Rosenstock and Merrill Wallenstein, two Wahrhaftig graduate students, went on to influential careers at the National Bureau of Standards.

To accommodate the growing number of people in the department and concomitant expanding research activity in Chemistry, several World War II wooden army buildings were relocated east of the combined Physics/Chemistry Building. Some of the "temporary" buildings of that era still exist in various locations around the campus, most notably the "Annex" located due east of the Huntsman Center. However, a two story wooden barracks building that was relocated north and east of the Park Building disappeared many years ago. It bore the rather pretentious name of "The Institute for the Theory of Rate Processes" and housed many of Henry's research students in torrid summer heat and chilling winter cold until his research program was accommodated in an old brick building ("Applied Research" due north of the Park Building). This building was razed in the 1990's to accommodate construction of the beautiful INSCC Building, which houses students from the Departments of Physics, Chemistry and Engineering who do computationally intensive research.

A particularly vivid memory for many of the graduate students in the department of Chemistry in the 1950's is that of Professor Henry Eyring's quantum mechanics course taught from his textbook (Eyring, Walter and Kimball). The class was held every Monday, Wednesday and Friday at about 9:30 a.m. in the office of the Dean of the Graduate School at the north end of the Park Building (where President Machen is now housed). The book has a green cover, is very mathematical, and is difficult to read, so it was frequently called the "green diamond." At the same hour on Tuesday, Thursday and Saturday mornings, most of the same students came back for a dose of statistical mechanics from an orange colored paperback irreverently called the "yellow peril" that had been put together from Marilyn

Alder's in-class notes. In the summer these arcane topics gave place to the theory of rate processes taught by "the Dean" from his textbook co-authored by Glasstone, Laidler and Eyring. One summer in the late 1950's Henry held class on Independence Day, July 4th, and on Pioneer Day, July 24th. This insistence on putting schoolwork ahead of public holidays seems a little extreme in hindsight, but he brought an infectious enthusiasm for science to these classes that had a very broad impact on the climate for scientific research on the "U" campus. Many students enrolled in his classes from departments other than Chemistry, which greatly enlarged his impact on the developing research programs across the entire University of Utah campus.

It is worth considering why the personality of Henry Eyring had such a great impact on the Chemistry Department throughout the 35 years (1946-1981) he was on the faculty. Robert Miller, in 1984-86, interviewed a number of Henry Eyring's contemporaries as part of the E.L. Cooley Oral History Project (of the Marriott Library). Here are just four excerpts from that collection.

Kenneth Pitzer, former university president (Stanford and Rice) and distinguished faculty member at UC Berkeley, speaking to Miller in 1984 stated: "[Henry] was friendly, enthusiastic and extremely self-confident…he was a good salesman of science."

Melvin Calvin, long time faculty member at UC Berkeley and Nobel Prize winner said: "[Henry] was a very skillful lecturer. Very informal. He was very, very, good, but very precise. It was always great to listen to him, always."

Glenn Seaborg, UC Berkeley faculty member, former American Chemical Society president and Nobel Prize winner stated: "He (Henry) was a very clear lecturer. He made things sound understandable, perhaps deceptively so. You had the impression after he explained something that you understood it. [He was] very alert. Articulate. Almost exuding intelligence. A good conversationalist. I would say pleasant. But persistent. He was in good health. Full of energy."

The above three statements illustrate that Henry Eyring was a man who was equally balanced not only in matters of chemistry but also in life. Henry had a warm heart and a wonderful personality. He also had a knack for helping others feel at ease when situations were tense. An example of this comes from one of his students.

John Morrey, one of Henry's Ph.D. students and subsequently a member of the technical staff at the Pacific Northwest Laboratory of the Department of Energy, stated: "I remember an experience I had when I came into his lecture room, next to his office in the Park Building, for my Ph.D. oral exam. I came in a little early, and he was the only member of the committee there. He sensed I'm sure, that I was pretty nervous. And so he said to me, 'John, have you ever seen me jump on the table from a standing position?' There was a big oak table in his room. I said, no. He jumped, but he didn't make it. He sprawled out over the table, catching his shins on the edge. It must have nearly killed him. I'm sure it hurt terribly. He winced, backed off, and he said, 'I didn't make it.' He jumped again. And that time he did. I guess that illustrates more his tenacity and his competitiveness, in a sense with himself, rather than his humor, but he had a great sense of humor. His lectures would be filled with humor. Most of the time the humor was on him, and I think that was one of his magical qualities that made people accept him. There were times when he'd become a little frustrated at someone and turn it on someone else, but not very often."

Henry Eyring, jumping on top of a desk from a standing position circa 1960.

Tenacity was certainly one of Henry Eyring's most notable personality traits. The following illustration is from an unpublished autobiographical sketch written on August 8, 1976 when Henry was 75 years old: "A story that mother used to tell about me before I could remember is of father coming home from the cattle ranch [in northern Mexico] with his horse covered with sweat, unsaddling him, putting me on the horse's back and she and father walking down to the river just behind the horse to water the horse. When the horse got out into the river, he shook himself as sweaty horses do and the two-year old tumbled off into the river. According to reports, my first remark after being fished out of the river was 'Put me

back on the horse,' which was done. I have no memory of learning to ride. As far as I know, I always knew how."

During the 1950's Henry Eyring initiated foot races against his research students. However, the first foot race was against several women working in the Park Building including his secretary, Belva Barlow (later Ashton). Henry won that first race decisively. Soon afterward G. Homer Durham and Sterling McMurrin, two of the leading officers of the University Administration, who were somewhat younger than Henry, challenged him to a foot race. In a well-publicized race on the asphalt outside the old Bookstore the two challengers both fell down and failed to finish the race, to the considerable amusement of the community. This ended Henry's string of victories at just two races. For many years thereafter Henry ran against his research students each summer, awarding at least four cash prizes yearly to the fleetest footed. Henry never won any of his own prize money, but it was impressive to see how hard he ran in what amounted usually to a fifty yard dash. There are many people in the community who would not be able to tell you the first thing about Henry Eyring's chemistry but who could tell you about one of those foot races, particularly one that was shown briefly on national television.

Elton L. Quinn was head of the University Chemistry Department from 1947-49. In the 1948-49 University catalog the following department faculty members are listed:

> Professors Elton Quinn, Lloyd Malm, and Henry Eyring, Associate Professors Vic Beard, Randall Hamm, Bill Burke, Jim Horton, Assistant Professors Stuart Haynes, Jim Sugihara, George Hill, Austin Wahrhaftig, Ransom Parlin and Bruno Zwolinski

Lloyd Malm was a superlative teacher of inorganic chemistry. A national effort to improve freshman chemistry came along in the 1950's called the Chem Study program. It was headed by George Pimentel of UC Berkeley and enlisted some of the top professors across the country to develop instructional materials. Lloyd was deputized to write a freshman laboratory manual for the Chem Study program that yielded substantial royalties in support of undergraduate scholarships in the University of Utah Chemistry Department. Vic Beard would later run the Associated Rocky Mountain Universities consortium for the Department of Energy in the early 1960's. Randall Hamm left the University of Utah for Washington State University, where he continued his productive research studies of inorganic complexes in solution. Jim Sugihara became a dean at the University of North

Dakota in the early 1960's. George Hill created the Department of Fuels Engineering (recently merged with Chemical Engineering) and was elected to the National Academy of Engineering for his pioneering research in coal chemistry. Ransom Parlin, a gifted physical chemist, left Utah in the 1950's and died prematurely. Bruno Zwolinski also left Utah in the 1950's to become the influential director of an international bank of thermochemical data housed at Texas A&M University. Rufus Lumry (not listed above) also was a faculty member in the 1950's before moving to the University of Minnesota where he taught and researched in biophysical chemistry with distinction.

Many of the above chemists continued to serve on the Chemistry faculty under Elton Quinn's successor. William (Bill) J. Burke, an organic polymer chemist served as department head from 1949 until 1962. According to the 1956-57 University catalog the faculty in Chemistry consisted of the following people:

Bill Cagle (c.a. 1955), an avid collector of rare books, including first editions of LDS literature, who referred to himself as a "backsliding Methodist."

Professors Bill Burke, Lloyd Malm, Henry Eyring, Carl J. Christensen, Randall Hamm, Jim Horton, and Jim Sugihara, Research Professor Alexus Ree, Associate Professors Austin Wahrhaftig, Ransom Parlin, Bill Cagle, and Richard P. Smith

Assistant Professor Burl E. Bryant, Assistant Research Professor Betsy J. Stover, and Technical Assistant Curator Lynn Austin

Before teaching for several years in Chemistry at the end of his career, Carl Christensen was the dean of the College of Mines and Mineral Industries and later what we would now call the Vice President for Research. Carl was a crystal grower from his days at Bell Labs and founded a local company that grew sonar crystals for French submarines. Alexus Ree was a theoretical chemist who was highly regarded in his home country of South Korea. Alexus funneled many talented Korean graduate students into the Chemistry Department to work with either himself or with Henry Eyring.

Bill Cagle was probably the most unique "character" to ever teach in the Chemistry Department. Bill earned a Ph.D. from the University of Illinois in 1946. He was every bit as smart as a doctoral degree awarded at age twenty-two would suggest. He was subsequently a postdoctoral research student at the Institute for Advanced Study in Princeton, N.J. At the University of Utah, he developed the quintessential "look" of the eccentric professor. Students would sometimes see him walking across the campus talking to himself with his head slightly bowed and rubbing his hands together in evident satisfaction. Those students who became acquainted with him as a lecturer found Bill to be approachable, pleasant and extraordinarily well organized in his lecturing style that he salted with amusing asides. His faculty colleagues heard many of Bill's anecdotes so often that they could recite them by heart. Bill was the ultimate repository of useful chemistry knowledge, now superceded by the Web-of-Science database. He and his students published some beautiful x-ray crystallographic studies of small molecules. Bill was also an avid collector of rare books, including first editions of early LDS literature. He characterized himself as a "backsliding Methodist" but could give you better answers about Mormon history than just about any "Saint". Bill never married, and his heirs sold his wonderful collection of books when he died without a will at age 63 in 1986.

Richard P. Smith is a native Utahn. In 1946, while he was in the military in Japan, Richard learned about Henry Eyring coming to the University of Utah and decided that he would like to work in the area of physical chemistry. He got his Ph.D. with Henry Eyring and then spent three years at Cambridge, MA, as a prestigious Harvard Fellow. After fewer than ten years on the University of Utah Chemistry faculty Richard went to work for Exxon in New Jersey, where he now resides in retirement.

Betsy Jones Stover was also a Utah native. After getting her Ph.D. in physical chemistry Betsy became the director of a big Atomic Energy Commission project in the University of Utah Medical School that studied disease and mortality of a very large colony of beagle dogs that had been systematically poisoned with plutonium. She wrote many scientific papers, some of which were co-authored with Henry Eyring. Her appointment in Chemistry as a research professor was a recognition of this longstanding collaboration with Henry. She may have been the first woman listed in the University catalog as serving on the Chemistry Department faculty although her primary University appointment was always in

the Medical School. She moved many years ago to North Carolina, where she has since passed away.

Lynn Austin retired after teaching chemistry in a California junior college for many years. At the time of his service on the University of Utah faculty he was charged with the management, among other responsibilities, of the undergraduate laboratories. Lynn had bright red hair in those days and a thoroughly engaging personality.

As head of the department, Bill Burke was asked in 1956 to compose a ten-year department history for President A. Ray Olpin. Following is that report (dated August 17, 1956):

Graduate Programs

The first Ph.D. from the University of Utah was awarded in 1947 in the field of chemistry. Since that time the graduate program in the Department of Chemistry has grown rapidly from a very few students to an average of 45 to 50 over the past several years. Of the 208 Ph.D.'s awarded to date by the University of Utah, 54 have been in chemistry. On the basis of a recent visitation by two eminent chemists, Dr. Ralph Shriner of the University of Iowa and Dr. John Willard of the University of Wisconsin, the Committee on Professional Training of the American Chemical Society commended the department on the "excellent program of training in chemistry at the doctoral level."

A wide variety of important problems in representative areas in the field of chemistry are under current investigation. These include studies in: reaction rate theory, mass spectra and molecular structure, polarography, explosion phenomena, catalysis, plastic flow, structure and quantum mechanics of activated complexes, sintering of alumina, kinetics of the oxidation of carbon, transport processes at electrodes, combustion, surface chemistry, chelate complexes, boron alkyls, photosynthesis, Gilsonite, polycarbocyclic ring systems related to colchicine, mechanisms of organic reactions, carbohydrates, chemotherapy, phenol-formaldehyde, and heterocyclic compounds.

The rapid growth of the research program in chemistry has created serious problems with regard to laboratory space and supplies and equipment. However, national recognition of the quality of the staff has resulted in considerable support for our research activities from private industry, non-profit corporations and various branches of the federal government. Supporting agencies include the National Science Foundation, Atomic Energy Commission, Office of Ordinance Research, Office of Naval Research, Air Material Command, California Research Corporation, American Gilsonite Company, Purex Corporation, Research

Corporation of America, and the National Foundation for Infantile Paralysis. Our high level of research activity has been possible only through such assistance and the attitude of the University administration toward creative work.

The excellence of the graduate program in chemistry has resulted in the attraction of highly qualified graduate students as teaching assistants in spite of our comparatively low stipend. These assistants have greatly contributed to our capacity for handling large numbers of students with a relatively small senior staff. This program has increasing significance in view of the difficulty colleges and universities are now experiencing in obtaining qualified teaching personnel.

At present most of the research in chemistry is housed in three separate temporary buildings. It is hoped that adequate permanent facilities can be provided in the near future for research in this important area.

Undergraduate Program

While the number of students graduating with bachelor degrees in chemistry has not been large, an unusually high percentage of these have gone on and completed their work for Ph.D. degrees. Many have been awarded substantial fellowships in national competition. This of course is related to the solid program of courses offered by the department and to the individual attention and encouragement given to our students. Several members of the staff have been active in the development of a superior general education course in chemistry.

In addition to majors, pre-medical, pre-dental and other students in the University college, large numbers of students from other colleges, such as Engineering, Pharmacy, Nursing and Mines and Mineral Industries also take basic work in our department. As a result of the continued increase in enrollment, it was necessary over the past few years to provide new facilities for laboratory instruction in physical and organic chemistry. At present one of our two general chemistry laboratories is being remodeled so that it will accommodate about 50% more students. While most of the antiquated laboratories in the department have been remodeled during the past six years, there is at present a desperate need for an adequate laboratory for quantitative analysis.

Other Activities

The Department of Chemistry sponsors a biweekly seminar in which the speakers are drawn about equally from our staff and from other departments throughout the University. We are hopeful that such a plan will stimulate others to become interested in our seminars. At the same time this enables our staff and graduate students to get a first hand picture of research interests and activities in other areas of the University. In addition, the Department

sponsors two other biweekly seminars. One of these is concerned with organic chemistry and the other with physical, analytical and inorganic chemistry. These seminars are in general more highly specialized and are designed to give our graduate students an opportunity to present and discuss various topics of current interest in Chemistry. The Department has also worked closely with the American Chemical Society, Sigma Xi and the Division of Biology in sponsoring prominent speakers.

Members of the staff have actively participated in the American Chemical Society and other national scientific organizations. Over the past ten years there has been a major increase in the number of scientific publications from the department. Dean Henry Eyring has been the recipient of numerous medals and awards for his outstanding contributions to science. Among these were the Nichols medal, the Bingham medal, and the Research Corporation Award. He was also invited to give the Edgar Fahs Smith Lecture at the University of Pennsylvania, the G.N. Lewis Lecture at the University of California and the William Pierson Field lectures at Princeton.

Bill Burke was a forceful department head with an engaging smile and an affinity for bow ties. He ran a very active research program in polymer chemistry in one of the one-story wooden shacks east of the Physics/Chemistry building and had a number of graduate students, including Richard (Dick) Quisenberry, Harold Higginbottom and Gary Goken who went on to very successful careers in industry. The department secretary during the latter part of Bill's long leadership was Irene W. Paul.

Graduate students in the department of Chemistry at the University of Utah during the 1950's took a written preliminary exam ("prelim") over a two-day period to qualify for Ph.D. candidacy. Those intending to write a dissertation in physical chemistry took a grueling "general prelim" the first day that covered graduate course work in analytical, inorganic and organic chemistry. The "special prelim" the next day tested the student's knowledge of physical chemistry in some depth. Corresponding "special prelims" were administered to students majoring in each of the other three areas of chemistry. The result of this brutal coursework and testing program was that a star organic chemistry graduate student such as Bryant Rossiter went off to his first job at Kodak with more knowledge of quantum mechanics and statistical mechanics than would be true of the University of Utah's year 2000 Ph.D. graduates in organic chemistry. Bryant's extraordinarily successful thirty-year career

as a research leader at Kodak was obviously the result of his bright mind and pleasant personality. However, the University of Utah Chemistry faculty of the 1950's was bound and determined that every graduating Ph.D. would have the broadest knowledge of chemistry possible.

The demand for well-qualified Assistant Professors of chemistry was so great nationwide in the latter 1950's and early 1960's that it made sense to hire some University of Utah graduates. Bill Burke led the faculty in appointing Richard P. Smith (University of Utah Ph.D., Harvard post-doc), J. Calvin Giddings (University of Utah Ph.D., Wisconsin post-doc), David M. Grant (University of Utah Ph.D., Illinois post-doc), and Edward M. Eyring (University of Utah Ph.D., Goettingen post-doc) between 1955 and 1961. The only Assistant Professor appointed during that period that had not earned a doctorate at the University of Utah was William W. Epstein (UC Berkeley Ph.D., Illinois post-doc).

The Big Move and Dave Grant's Recruiting Frenzy

David M. Grant succeeded Bill Burke as department head in 1962. Having someone who is not yet a full professor chair a department is not very common for political reasons. Dave Grant has always demonstrated the attributes of a successful leader, and his appointment to the role of Head was clearly one of the best ever-made in the Chemistry Department.

The 1963-64 University catalog lists the following faculty members in Chemistry:

Jerry Driscoll and Ron Ragsdale presenting their annual "Faraday Christmas Lecture", complete with old English tophats.

Associate Professor and Head: David M. Grant, Professors Bill Cagle, Carl Christensen, Henry Eyring, Jim Horton, Lloyd Malm, Jim Sugihara, and Austin Wahrhaftig, Research Professors Cal Giddings and Alexus Ree, Associate Research Professor Betsy Stover, Assistant Professors Bill Epstein, Ted Eyring, Evan L. Allred, George W. Latimer, Ronald O. Ragsdale, Wesley G. Bentrude, Dennis J. Caldwell and Roger Kust.

Bill Epstein, retired in 1998, and now residing in San Luis Obispo, CA, is a natural products organic chemist. His "road map" problems in Honors Organic Chemistry challenged talented undergraduates for generations. Bill also knew how to combine the hunt for interesting new plants for his natural products studies with pleasant fly fishing trips to the Pacific Northwest. Ted Eyring continues his research on topics as diverse as the kinetics of oxidation of phenol by aqueous iron(VI), the synthesis of oxygenated fuel additives for automobile engines, and the enzymatic activity of proteins encapsulated in porous glass monoliths. Ted has somehow always managed to be slightly out of step with his colleagues. With the help of Dr. Laya

Kesner he continues to promote service-learning pedagogy favored more by social scientists, and he is often the only person in the building wearing a necktie. George Latimer was a Salt Lake native who earned his Ph.D. in analytical chemistry at Princeton. He came to the University of Utah faculty from PPG in Corpus Christi and went back there after a couple of years for personal reasons. Dennis Caldwell was a theoretical chemist who left the University to work in industry (Hercules) and then came back to the University of Utah campus as a faculty member in Chemical Engineering. Dennis and Karin Caldwell (Research professor, later chair of Bioengineering at the University of Utah) now reside in Uppsala, Sweden. Roger Kust was an electrochemist who left the department for industrial employment in New England.

In the year 2000, Professors Ragsdale and Bentrude remain on the faculty. Ron's impact on freshman chemistry is legendary. He has probably taught more high school and first year undergraduate students than anyone else who has ever served on the Chemistry faculty. The lecture demonstrations developed with Dr. Jerry Driscoll for Ron's lectures have been incorporated into "Faraday Christmas Lectures" that have become the one aspect of the Chemistry Department best known to the citizens of Utah. Michael Faraday was one of the most distinguished chemists of the 19th century. As director of the Royal Institution in London he initiated public lectures at Christmas time that included exciting chemical demonstrations, hence the above, rather formal, name for what is familiarly called the "Ron [Ragsdale] and Jerry [Driscoll] Show." Ron's international travel in support of the International Baccalaureate program in chemistry possibly surpassed in mileage and exotic destinations the feats of the most energetic travelers on the Chemistry faculty.

Wes Bentrude has also taught large numbers of students enrolled in the sophomore organic chemistry courses as well as in graduate organic chemistry courses. In his 37 years of service at the University of Utah to date, Wes has had a well-funded research program in phosphorus organic chemistry. Although Wes now spends half of each academic year fishing in Florida, he and his students are continuing to publish research consistent in quality and quantity with the high standards that Wes has always set for himself.

In 1963 the Utah legislature authorized planning for a new chemistry building. Wilford Burton and Royden Derrick were Regents who played a decisive role in getting the building funded. Austin Wahrhaftig was deputized to provide counsel to the architect, Henry

Fetzer, over the next five years. Austin's attention to detail and foresight had a very beneficial impact on the final design of what is now called the "North Wing of HEB". Also in 1963, Henry Eyring had the honor of serving as the elected president of the American Chemical Society.

Roland Robins joined the faculty in 1964. He had a country boy style of talking and a high energy level for research in nucleoside chemistry. His big research group gave the faculty a glimpse of what major federal funding could do in building up organic chemistry research in the department. Roland left the department a few years later to work in a pharmaceutical firm in California and has since passed away.

Dave Grant succeeded in recruiting Pete D. Gardner to the faculty in 1965. Pete was a tenured full professor of organic chemistry at the University of Texas at Austin. In addition to his expertise in research, Pete brought unusual leadership skills to the Utah campus and served with distinction as Dean of Science, Academic Vice President to President David P. Gardner (no relation), and Chair of Biology, successively. Pete died prematurely at age 62 on February 4, 1989.

In 1965, the University instituted the Distinguished Teaching Award. This is an award made at Commencement in honor of three to five faculty members throughout the University to recognize exceptional teaching performance. Lloyd E. Malm was one of the first three recipients of this prestigious award in 1965. The names of the six faculty members from the Chemistry Department who have won this award appear in the awards list at the end of this volume.

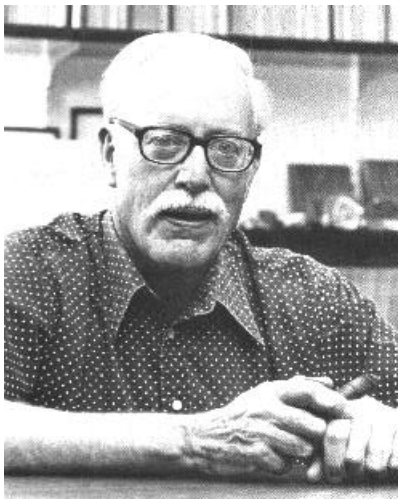
The President of the University in 1992 established another University wide teaching award called the Presidential Teaching Scholar Award. This award is made to ten faculty members each year and their salaries are increased by $5,000 per year with continuing adjustments for inflation until

Dave Grant (right) and Ted Eyring (left) exhibit their teaching skills in the new Chemistry building (late 1960's).

they retire. Four recipients from the Chemistry Department are listed at the end of this volume.

Starting in 1999, the three Distinguished Teaching Awards and the ten Presidential Teaching Scholar Awards were rolled into just six Distinguished Teaching Awards made each year.

The University Distinguished Research Award also had its beginning in 1965 with a single award being made that year to Leroy J. Robertson, a composer on the Music faculty. The next year there were two Distinguished Research Awardees: Henry Eyring in Chemistry and Jacob Geerlings in Languages. Since 1970, three Distinguished Research Awards have been made each year at Commencement. Members of the Chemistry Department faculty have been honored with the Research Award more frequently than any other department on campus by a wide margin. The thirteen Chemistry faculty recipients of this award are listed (by year) in the Awards section at the end of this volume.



Cheves Walling was already a member of the National Academy of Sciences when he came to the University.

In 1966, Jean Futrell joined the faculty in the rank of Associate Professor and brought with him a well-funded research program in mass spectrometry that became well known for advances in chemi-ionization. About sixteen years later Jean moved to Delaware, where he chaired the University of Delaware Chemistry Department with distinction. Jean is now the Director of the William R. Wiley Environmental Molecular Sciences Laboratory at the Pacific Northwest National Laboratory in Richland, WA. While Jean was at the University of Utah he was exceptionally successful in teaching his graduate students how to do important research in mass spectrometry. A notable illustration of Jean's success as a teacher and researcher are the recent achievements of two of his former University of Utah Ph.D. students. Dr. Richard D. Smith and Dr. Marvin L. Vestal have both recently made important contributions to the development of new approaches to study proteomes. A proteome is the entire complement of proteins that can be expressed by a particular cell, organism or tissue; proteomics is the study of the protein complement

expressed at a given time or under a specific set of environmental conditions. While the availability of complete genome sequences, as now being provided by the Genome Program, opens the door to important biological advances, much of the real understanding of cellular systems and the roles of its constituents will necessarily be based upon proteomics. The capability to precisely measure changes in the relative expression of numerous proteins simultaneously enables identifying and understanding the function of the proteins participating in the multiple pathways, as well as insights into how cellular networks are linked.

Smith and Vestal have been separately developing tools based upon mass spectrometry for making more effective proteome measurements. Dr. Vestal (Applied Biosystems) has developed a new tandem time of flight mass spectrometer that allows orders of magnitude higher throughput for protein identification, presently a major bottleneck in proteomics. Dr. Smith (Pacific Northwest National Laboratory) has developed and applied a new approach that uses a new ultra-sensitive Fourier transform mass spectrometry developed in his laboratory, along with stable-isotope labeling, and the new concept of "accurate mass tags" to make much more comprehensive, sensitive, faster and quantitative proteomics measurements than previously possible. The global perspective that results from proteomics measurements provides a comprehensive view of the detailed changes in cellular pathways and networks, thereby improving the understanding of how biological systems respond to environmental perturbations. The practice of proteomics is expected to have profound impacts in areas that range from drug development to biotechnology.

The department moved into the first phase "north wing" of the present Chemistry Building in January 1968. Some months later Sir George Porter, the Director at that time of the Royal Institution in London and a 1967 recipient of the Nobel Prize, gave the principal invited talk at the dedication of the new building.

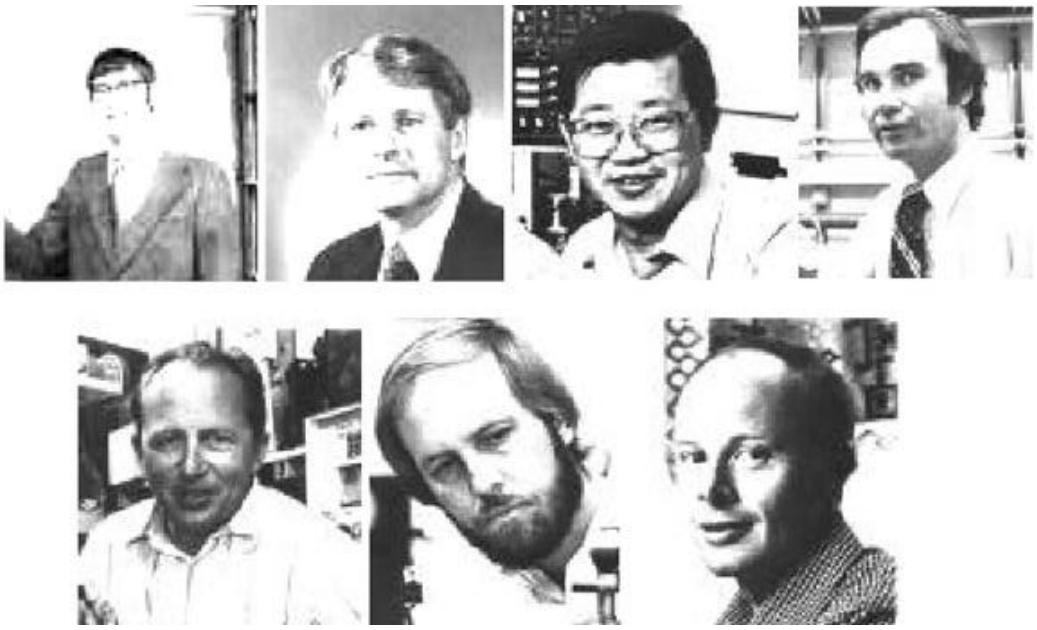
The availability of more space for research in this new building was one of two factors that took the department to a new level of national visibility, permitting Dave Grant to attract outstanding new faculty members. The other factor was a three-million-dollar Center of Excellence Award from the National Science Foundation, wisely used to develop a teaching intern program for postdoctoral students and to expand major research instrumentation used by more than one faculty member, rather than simply to enlarge the size

of the faculty. Steve Hadley was appointed to the rank of Assistant Professor at about this time (1968).

Robert W. Parry, an internationally known inorganic chemist, came to the University of Utah from Michigan in 1969. He had actually spent the previous year at the University of Utah looking the department over while on leave from Michigan. In the same year (1969), Cheves Walling came to Utah from Columbia. Cheves was already a member of the prestigious National Academy of Sciences and was known worldwide for his research in free radical organic chemistry. While at the University of Utah, Bob would become the President of the American Chemical Society and Cheves would serve for a number of years as the Editor of the Journal of the American Chemical Society, arguably the most influential chemical periodical in the world. Parry and Walling were both appointed to the rank of Distinguished Professor, a title already held at that time by Henry Eyring. Overnight the University of Utah became a more prestigious Chemistry Department where the ablest young chemists could reasonably aspire to build their research careers to international prominence.

Thus, Dave Grant was in a position to recruit a string of outstanding junior faculty members [Peter Stang (1969), Dale Poulter (1969), Chin-Hsien (Jim) Wang (1969), Len Spicer (1969), Josef Michl (1971), Bill Breckenridge (1971), and Jack Simons (1972)] who contributed strongly to the growing research reputation of the department, even as their original research interests changed. Peter Stang, trained as a physical organic chemist, has become a distinguished organometallic chemist. Dale Poulter, also trained as a physical organic chemist, is a widely known biochemist. Jim Wang shifted immediately from NMR spectroscopy to a very productive career in laser spectroscopy of polymer solutions. Len Spicer switched from hot atom chemistry to a career in health-related applications of NMR spectroscopy, which he now pursues at Duke University. Bill Breckenridge was thought by the hiring committee to be a solution phase inorganic chemist but has become well-known instead as a chemical physicist interested in excited states of gas phase species. Jack Simons had been pigeonholed by the hiring committee as a statistical mechanics expert but developed into a world authority on the quantum mechanics of negative ions. Josef Michl was the only member of this group of gifted young chemists who did not surprise the faculty in his choice of research problems, because from the very beginning his interests were spread over a broad range of topics in theoretical and experimental organic and physical chemistry.

Another important addition to the faculty in 1969 was Goji Kodama. He was Bob Parry's principal research coworker for many years in the Research Professor ranks. Later Goji became a full professor and in that capacity taught many students the intricate techniques of vacuum line synthetic inorganic chemistry. Goji retired in 1996.



The fruits of recruiting while Dave Grant was Chairman of the Department were impressive, as he was able to hire seven capable and accomplished scientists in a short amount of time, from 1969 to 1972 (From left to right: Stang, Poulter, Wang, Spicer, Michl, Breckenridge, and Simons).

Dave Grant would later be appointed to the rank of Distinguished Professor and would win the Rosenblatt Prize among many other honors. His research program in solid state C-13 NMR spectroscopy continues to be enormously productive in scientific papers, research funding, and favorable publicity for the Chemistry Department. That being said it is appropriate to remark that Dave is probably the one person who by his distinguished research, wise administrative decisions, and sagacious counsel has done the most to propel the Chemistry Department to its present prominence.

New Chairs and New Challenges

Early in Ted Eyring's tenure as chair (1973-76) the 1973-74 University catalog listed the following faculty members in Chemistry:

> Distinguished Professors Henry Eyring, Bob Parry, Cheves Walling, Professors Evan Allred, Wes Bentrude, Bill Cagle, Bill Epstein, Ted Eyring, Jean Futrell, Pete Gardner, Cal Giddings, David Grant, Frank Harris, Ron Ragsdale, and Austin Wahrhaftig, Associate Professor Josef Michl, Assistant Professors Bill Breckenridge, Steve Hadley, Dale Poulter, Jack Simons, Len Spicer, Peter Stang, and Jim Wang

At this time Millie Trevithick was the department secretary. She had had many years of experience in the Physics Department and ran the business of the Chemistry department both efficiently and pleasantly.

Frank E. Harris is a theoretical chemist with interests in the electronic structures of atoms, molecules and solids. His work has ranged from the development of new calculational methods to detailed studies of specific systems that can be related to experiments. Some of the present day superstars of theoretical chemistry-including H.F. (Fritz) Schaefer (Georgia), Howard Taylor (USC) and Josef Michl (Colorado)-got some of their early research experience in Frank's research group. At the University of Utah, Frank was first appointed to the faculty in Physics and later had a joint appointment in both Physics and Chemistry. Frank was also Dean of the College of Science in the early 1970's. He resigned his faculty appointment in Chemistry in 1998 but still has a part-time faculty appointment in Physics.

During his three-year chairmanship, Ted Eyring had the opportunity to hire only one new faculty member, Professor William (Bill) A. Guillory. Bill had a Ph.D. from UC Berkeley, and was a tenured faculty member at Drexel University in Philadelphia. He had a strong chemical physics research operation involving a variety of laser spectroscopic tools. Bill joined the University of Utah faculty in 1974 and assembled a big group of research co-workers located in the general vicinity of the present high vacuum surface spectroscopy lab in the North Wing. Bill has a truly charismatic personality. With his extraordinary leadership skills it made sense for him to become chairman in July 1976, just two years after joining the faculty.

Bill had the opportunity to hire three members of the present faculty: Richard D. Ernst (1977), Joel M. Harris (1976), and Gary E. Keck (1977). Rick Ernst's research program in synthetic inorganic chemistry continues to be productive and has given rise to ongoing federal funding as well as many Ph.D. students and widely cited scientific papers. Rick has also gained a well-deserved reputation for excellent teaching.

Bill Guillory became the Department chairman in 1976 after just two years of service at the University of Utah.

Joel Harris was awarded the rank of Distinguished Professor in the year 2000 in recognition of his extraordinary achievements as a teacher and researcher in analytical chemistry. His pioneering research in developing instrumentation to study phenomena such as fluorescence and the thermal lens effect resulted in his receiving the ACS Division of Analytical Chemistry Award in Chemical Instrumentation in 1991. For several years now Joel has been editor-in-chief of Applied Spectroscopy, one of the most frequently cited periodicals in analytical chemistry.

Gary Keck is a demanding teacher of organic chemistry and his publications in the areas of synthetic chemistry and natural products chemistry are among the most cited in the world. Several of his former Ph.D. students are making their own mark in synthetic organic chemistry. Gary has become a vocal proponent of better digital computing opportunities for University of Utah undergraduates.

Bill Guillory also participated in the hiring of a more senior faculty member, Charles S. (Chuck) Fadley. Chuck had established a first rate XPS surface science research program at Hawaii before he joined the University of Utah faculty in 1979. After two years at the university, Chuck elected to return to Hawaii for personal reasons. The surface science expertise, which the department needed, came much later (in 1989), with the appointment of Thomas P. (Tom) Beebe, Jr.

Bill Guillory also devoted a great deal of energy and time to promoting the reputation of the department throughout the world. He was first to start the comprehensive matching of faculty with national and international awards, identifying every award available in chemistry and chemical physics that related to University of Utah faculty expertise. That first year the number of awards made to university faculty members went up by more than 300%. This approach has since been institutionalized in the department by a standing Awards Committee, presently chaired by Joel Miller.

Bill also began a formal program of bringing in undergraduate students to do summer research for possible recruitment into our graduate program. That program produced 20% to 33% of our new graduate students of the period. This program was institutionalized under the direction of Associate Chairman Richard (Rick) Steiner, who was hired by Guillory to be the first permanent associate chairman for the department in the summer of 1977.

Toward the end of his chairmanship, Bill successfully negotiated an agreement with President David P. Gardner to fund the South Wing addition to the Chemistry Building. The Chemistry South Wing did not get to the top of the State Building Board construction priority list while Bill was chairman, but President Gardner did follow through later on this commitment to Bill. The Chemistry Department was fortunate that the university was presided over by a person favorably disposed toward the physical sciences at the same time that Chemistry had a chairman who was an especially gifted negotiator. Bill stepped down as Chairman on July 1, 1979. He resigned his professorship in 1986 to begin working full time in his own consulting company, Innovations International, which continues to prosper in Salt Lake City.

Further Pooling of Resources

Professor Josef Michl succeeded Bill Guillory in 1979 as Chairman. In 1978, Josef published eighteen research papers back-to-back in a single issue of "JACS" [J. Am. Chem. Soc. 100, 6801-6898 (1978)]. This phenomenal research productivity was just one highlight of his years (1971-1987) as a faculty member at the University of Utah, but it suggests the dynamic impact he had on research in the department as Chairman from 1979-1984. The growth in research activity exacerbated the need for more laboratory space. Professors Michl, Frank Harris and Austin Wahrhaftig therefore documented the detailed space needs in a proposal that Professor Michl carried to President David P. Gardner. This document reinforced the President's determination to go ahead with an expansion of the still fairly new Chemistry Building. Professor Austin Wahrhaftig played a critical subsequent role in the design of the new South Wing, which was completed and opened in 1986. There is a wall plaque in the vestibule to the South Wing (second floor) that honors Austin for his thoughtful design work on both wings of the Chemistry building.

Another important legacy of the Michl years is the use of departmental resources to build and maintain technical services (electronics shop, machine shop, glassblowing shop, optical spectroscopy services, x-ray diffraction services, NMR services, mass spectroscopy services, digital computing services, etc.). It is these resources that are the envy of major chemistry departments throughout the United States. At the time that Josef began this change in departmental spending habits, it was more the rule that each faculty member involved in research secured his or her own major pieces of equipment for new research initiatives. The pooling of resources through departmental cost centers fostered by Josef has had an obvious beneficial effect on the growth of research in Chemistry at the University of Utah. One of the reasons that the shared

Hans Morrow, the Department glassblower for over thirty years, busy at work.

use concept has worked so well is that scientists/engineers have been hired by the department to supervise the use and maintenance of this instrumentation and in some cases actually to run experiments on these instruments for research students. It would be difficult to list all the talented people who have served in this capacity over the past 20+ years. Persons currently (Oct. 2000) charged with these responsibilities include Dr. Elliot Rachlin (mass spectroscopy), Dr. Atta Aarif (x-ray crystallography), and Dr. Charlie Mayne and Dennis Edwards (NMR and EPR spectroscopy).

Another key to the strength of the University of Utah's chemistry research program has always been the high quality of the services offered by the department shops. The talented people presently heading up these services are Dale Heisler (electronics shop), Dennis Romney (machine shop), and Janice Kyle (glassblowing shop). From an historical point of view, one of the greatest stories in the technical services area at the University of Utah is the 30+ year term that Hans Morrow served as the glassblower (for the entire campus) before his retirement in 1998. In addition to being able to make or mend every conceivable form of scientific glassware, Hans was Chemistry's resident chess champion and all-around nice guy.

Not all of Josef's innovations took root. Josef initiated "Utah Chemistry Workshops" held at our mountain resorts. At these five-day meetings attended by most of our faculty and graduate students, the principal speakers were a combination of local faculty and distinguished scientists brought in for the occasion. For instance, in September 1981 Geraldine Kenny-Wallace (University of Toronto) and Stephen R. Leone (University of Colorado) were among the invited speakers addressing various aspects of "Lasers in Chemistry," the topic of this particular workshop. In September 1983, the title of the workshop was "Gas Phase Ion Chemistry Mass Spectrometry." In September 1984, the name of the workshop was simply "Biological Chemistry." Attendees at these workshops were generally enthusiastic. The workshops disappeared from the Chemistry Department annual program because of their cost.

During his five-year tenure as Chairman, Josef made an important administrative change that has had a long lasting positive impact on the Chemistry Department. Rosemary Laufer assumed her present day duties as Administrative Assistant to the Chair.

In December of 1980, the University gave the name of Henry Eyring to the Chemistry Building (North Wing). The occasion was marked by a ceremony in the foyer of the building at which Professor Richard B. Bernstein was the invited speaker.

Henry Eyring at the dedication of the Chemistry Building, named in his honor in 1980.

Professor Henry Eyring also spoke humorously and was clearly appreciative of the great honor of having a building named after him. The tradition on the University of Utah campus was to name buildings either for former presidents of the university or for major financial donors to the university, or persons who have passed away. Henry Eyring did not qualify on any of these counts. At the building dedication Henry told the following apocryphal story:

"As I was dozing lightly in my office some weeks ago, in walked President Gardner unannounced with one of the Regents. They strode around me and my desk several times, clucking softly and looking at me very closely. Finally President Gardner said to the Regent, 'Yes, I think he is close enough', and the two of them exited my office without another word. They evidently concluded on that occasion that I was near enough dead that I could cause the University no further embarrassment if they named a building after me."

Henry Eyring died in late December 1981 while still serving as a full-time member of the Chemistry faculty and principal investigator of a major research grant that funded the last of his students, Allan Peoples. Allan completed his Ph.D. dissertation several years later with the generous help of Dennis Caldwell.

In 1982, Bob Parry served as the elected president of the American Chemical Society. His three-year tenure as president-elect, president, and immediate past-president of the Society afforded the Chemistry Department positive visibility in the international chemical community that one can get in no other way.

In honor of Dr. Parry , a teaching award was instituted by the Chemistry department, with the generous help of Dr. Rodney H. Brady and Carolyn H. Brady.

Josef Michl had the opportunity to make several faculty appointments during his five-year tenure. Randy Shirts, a theoretical chemist, and Jim Takacs, an organic chemist, were appointed to the rank of Assistant Professor in 1982. Randy is now a professor at Brigham Young University, and Jim is a professor at Nebraska.

John Gladysz was also appointed to the faculty in the rank of Associate Professor in 1982. John went on to publish many scientific papers at the University of Utah and won the ACS Award in Organometallic Chemistry in 1994. One of the many ways that Josef Michl drew favorable attention to the University of Utah was by editing Chemical Reviews, an influential monthly periodical of the American Chemical Society. Josef enlisted John Gladysz as co-editor. It was a blow to the department in 1998 when John Gladysz accepted a chaired professorship at the University of Erlangen/Nürnberg in southern Germany.

B. Stanley Pons was hired as an associate professor in 1983. Stan came to the department from the University of Alberta at Edmonton and brought a strong electrochemical research program to the department. He had already made a reputation for innovation with his work on microelectrodes and for his refinement of IR spectroscopy of adsorbed mono-layers on electrodes viewed through an exceedingly thin layer of electrolyte solution. A little less than five years later, he served an eleven-month term as department chair.

Another Michl appointment was Charles A. (Chuck) Wight to the rank of assistant professor in 1984. Chuck is a physical chemist with a pre-Utah background in infrared spectroscopy and gas phase ion chemistry. At the University of Utah Chuck has built a strong research program in explosives and in thermochemistry generally. For instance, his students can tell from thermogravimetric measurements how long aspirin retains its efficacy

in dry Utah weather compared to a warm, humid climate. Chuck has become the campus guru concerning courses taught over the Internet. He also served in the influential but time-consuming role of President of the University Senate in 1999-2000.

Ted Eyring served a second term as department chair from July 1, 1984, to June 30, 1985. The following memo to the Chemistry faculty dated November 2, 1984, typifies Ted's notion of what should interest a faculty member:

Federal Research Dollars Per Full Time Faculty Member in Chemistry, 1982

Ranking	University	Dollars/ Fac. Member	Ranking	University	Dollars Fac. Member
1	Stanford	$ 294.7 k	26	Purdue	$ 82.2 k
2	M.I.T.	293.4	27	Colorado	81.0
3	Columbia	242.6	28	Minnesota	75.0
4	Johns Hopkins	211.1	29	So. Calif.	74.7
5	Cal. Tech.	187.4	30	So. Carolina	74.6
6	Harvard	181.5	31	Nebraska	68.8
7	Cornell	181.2	32	Massachusetts	67.6
8	Notre Dame	154.6	33	Maryland	66.7
9	Rochester	132.1	34	Texas Austin	66.2
10	Illinois	125.3	35	Ohio State	63.7
11	Chicago	123.9	36	SUNY Stony Brook	61.3
12	Indiana	117.7	37	Georgia Tech.	60.0
13	Princeton	113.0	38	Syracuse	58.1
14	Northwestern	113.0	39	Wayne St.	58.0
15	UCLA	110.6	40	Rensselaer	57.5
16	Pennsylvania	109.8	41	Lehigh	56.6
17	Yale	108.3	42	SUNY Buffalo	56.6
18	Calif. San Diego	103.1	43	Arizona St.	55.4
19	Utah	102.1	44	Texas A&M	54.3
20	Calif. Berkeley	101.6	45	Michigan St.	53.9
21	Penn. State	97.6	46	Washington	52.2
22	Oregon	93.7	47	Iowa	52.0
23	Wisconsin	92.8	48	Florida St.	38.8
24	Colorado St.	85.8	49	Oklahoma	38.1
25	Pittsburgh	84.2	50	Florida	31.9

The following table from the same period casts the University of Utah Chemistry Department in an even more favorable light.

ACS Directory of Graduate Research, 1985

Rank	Name of School	No. of Faculty (F)	No. of Publications (P)	Avg. P/F
1	Stanford	26	368	14.15
2	Cal. Tech.	25	344	13.76
3	M.I.T.	33	438	13.27
4	Columbia	17	225	13.24
5	California, Berkeley	56	735	13.13
6	Northwestern	29	347	11.97
7	Harvard	24	287	11.96
8	Cornell	32	375	11.72
9	Princeton	19	211	11.11
10	Chicago	29	320	11.03
11	Texas A & M	50	544	10.88
12	Texas	47	492	10.47
13	Georgetown	17	168	9.88
14	Utah	32	301	9.41
15	Indiana	37	346	9.35
16	California, Riverside	16	149	9.31
17	SUNY, Buffalo	29	266	9.17
18	Pittsburgh	29	266	9.17
19	Illinois, Urbana	44	386	8.77
20	Yale	27	226	8.37
21	Pennsylvania	26	212	8.15

During Ted's one-year second turn as chairman, two new Assistant Professors joined the faculty: Michael Morse and Thomas (Tom) G. Richmond. Michael had been a graduate student at Chicago in theoretical chemistry and then a post-doc in the Smalley group at Rice. At the University of Utah he and his students have become well known for their elegant laser spectroscopy of metal atom clusters in the gas phase. Michael has won the University-wide Distinguished Research Award (1997) as well as the Distinguished Teaching Award (1999). Each of these awards is made to only a very few faculty members each year and Michael is the only Chemistry faculty member who has managed to win both awards.

Tom Richmond is a synthetic inorganic chemist who earned his Ph.D. at Northwestern and did postdoctoral work at Cal Tech. He shared the ACS Nobel Laureate Signature Award for Graduate Education with his Ph.D. student, J. L. (Jackie) Kiplinger, in

1998. His research has focused primarily on the synthetic organometallic chemistry of fluorocarbons.

The appointments of Michael and Tom became effective on July 1, 1985. On this same day one of the mainstays of the department staff retired after more than 30 years of service. Gordon Hale had done a truly first class job of running the stockroom and other business aspects of the department and was honored by an open house that day in the HEB foyer.

Jack Simons began serving as department chairman on January 1, 1986. In the spring of 1986 the Chemistry faculty members were delighted by the election of Professor Josef Michl to membership in the National Academy of Sciences. Joy gave way to dismay shortly thereafter when Josef accepted a very attractive job offer from the University of Texas at Austin.

The following news article from the Sunday, November 9, 1986 issue of the Salt Lake Tribune, page 10B, captures the general tenor of that time nicely:

Lack of Resources Prompts U. Professor to Leave Post

Chemistry professor Josef Michl's reputation among his peers as a world-class scientist has made him a crown jewel of the University of Utah faculty.

But Dr. Michl has become booty in what U. officials say is a national raid on their College of Science. He has left Utah's flagship state university for the University of Texas at Austin, taking five top graduate students and half a million dollars in annual federal research grants with him.

One department head said further funding cuts could spark faculty members throughout the university to quit "in droves."

Dr. Michl's decision is an especially hard blow to the College of Science, which already has lost seven professors to other universities this year. He is an elected member of the prestigious National Academy of Sciences and has lectured at numerous international symposia, both markers of his standing in the global scientific community.

"Michl is the most visible, internationally recognized scientist we have in our department. His loss was a major one," said Jack Simons, chairman of the U. Chemistry Department. "Almost immediately people all over the world were asking, 'Why?' "

Josef Michl

His and other departures from the College of Science means the loss of $2.5 million in federal research money — 23 percent of the external funding coming into the college. Remaining faculty members fear that major out-of-state universities will continue to outbid Utah in salaries, equipment and facilities, causing a brain drain of world-class scholars and scientists at the state's largest research university.

Dr. Michl, who has worked 19 years for the U., points with pride to his department's national ranking by an independent rating association as 19th in overall quality, earned over two decades. But he fears that if budget cuts continue, quality programs could deteriorate.

"Quality at a university is like a charmed circle," said Dr. Michl. "To attract top faculty and graduate students, the university must have a good reputation. To get a good reputation you have to have excellent faculty, and to get that, you have to have good equipment and facilities, and so on. It takes many years to break into the circle and only a few years to fall out."

The offer that attracted Dr. Michl to the University of Texas is part of a package that could boost the Austin chemistry department to become the nation's best. Ironically, current ratings for chemistry departments at both the Austin and Salt Lake City campuses are similar.

"It's obvious Michl didn't believe Utah could break into the top ranking because of our resources," said Joseph L. Taylor, dean of the U.'s College of Science. "We've lost so many people, it's also obvious that we're being raided."

Besides Dr. Michl, four math professors, two biology professors, one physics professor and another chemistry professor have left the U. College of Science for other universities this year. Faculty members are extremely nervous, said Dean Taylor. "Morale is so low, it wouldn't take much more in the way of bad news from the state for people to start bailing out in droves."

For Dr. Michl, the Texas offer included $750,000 to remodel the university lab, more money for lab start-up costs, and a 75 percent salary increase. Utah's counteroffer for salary fell short of the Texas bid by 40 percent.

"I live comfortably and I can only drive one car at a time. My own salary wasn't a big factor in my leaving," said Dr. Michl. "But salary freezes in Utah have been a concern because salaries attract and keep good faculty. It's vital to work in a good environment."

More importantly, the Texas offer includes a $1 million endowed chairmanship, which guarantees that research money will be available, flexible, and independent of federal grant funding. The U. of U. Chemistry Department has tried unsuccessfully for five years to obtain a similarly endowed chairmanship. Texas also has a better library.

Despite near-record unemployment in their state, Texas University officials say they've been able to avoid salary freezes and set up endowments, partly because of income the higher education system receives from managing two million acres of land. The state's governing board of regents has matched more than 900 endowments from business and individuals the past few years, 65 of them worth $1 million.

By contrast, the U. has had to absorb seven budget cuts in 10 years.

Dr. Michl said his decision to leave Utah was influenced by previous budget cuts and was reached long before Gov. Norm Bangerter told educators to trim another three percent to make up for $48 million in revenue shortfalls. Dr. Michl is quick to add, however, that U. of U. administration has been supportive, he's grateful for experiences at the university, and Utah is a beautiful place to live.

"It's difficult to single out one particular event or reason that influenced my decision to leave," he said. "I suspect that's true for others as well."

Other contributing factors for Dr. Michl were worsening winter pollution and large class sizes for his two children, once enrolled in Utah public schools.

"I understand that the Utah taxpayer pays more than he would in most states for education, but with such large families, it's difficult for the money to go to improve quality," he said. "I've worked as a visitor at six other universities so I am somewhat qualified to say that if Utah had the money other universities do, this university could accomplish wonders. As it is, it's a struggle to make the money go beyond funding growth."

The U. isn't "fatally wounded yet," according to Dean Taylor. Only three math departments west of the Mississippi have achieved rankings as high as the U.'s and its chemistry department is ranked even higher. Both its biology and math departments were ranked first last year for showing the most improvement among public and private universities across the nation.

But if the number of professors leaving the U.'s College of Science approaches even 10 percent, the college could lose 75 percent of its research dollars, "and then, we might as well lock up the labs," said Dean Taylor. "We can't continue to be a top-rated research university unless we're prepared to offer the necessary resources to get the job done. What I'm saying is we're at risk if we can't turn things around."

The article mentions an "endowed chairmanship" when what is meant is an "endowed chair". A university invests an endowment of a million or more dollars in securities, and part of the income each year from the endowment is spent by the chairholder on her/his research. Professor Robert Parry and others have succeeded in raising more than $1.25 million from private donors to fully fund the Henry Eyring Presidential Endowed Chair in Chemistry. This success came in the year 2000, nearly 14 years after Josef Michl expressed pessimism to the writer of the news article above. There is another endowed chair in the Chemistry department called the John A. Widtsoe Chair, created for Prof. Dale Poulter at a time when

he was contemplating a very attractive job offer from Indiana University. The Widtsoe Chair was one of four chairs funded by the President of the University from research grant overhead money rather than from private donations.

During Jack Simons' chairmanship the department expanded into the new south wing of the HEB. Jack recognized this as a good opportunity to recruit new faculty members because of the availability of this new resource. Thus he led the recruiting of three new people: A biochemist, Thomas C. (Tom) Alber, and two physical chemists, Peter Armentrout

Faculty members in 1987 (starting in back, left: Tom Richmond, Michael Morse, Ron Ragsdale, Chuck Wight, Rick Ernst, Evan Allred, Dale Poulter, Wes Bentrude, Bill Epstein, Peter Armentrout, Stan Pons, Ted Eyring, Jack Simons, Goji Kodoma, Bill Breckenridge, and Joel Harris.

and A. D. J. (Tony) Haymet, were all appointed in 1987. Tom Alber's appointment as an assistant professor was shared between both the Chemistry and the Biochemistry Department. Five years later Tom accepted a position in Structural Biology at Berkeley.

Peter Armentrout had earned a Ph.D. at Cal Tech in the lab of Jack Beauchamp, done postdoctoral work at Bell Laboratories, and been a faculty member at the University of California Berkeley for several years before coming to the University of Utah in 1987 as Associate Professor. His research using high vacuum instrumentation has elucidated the thermodynamics of a wide range of gas phase systems. For instance, he and his co-workers have explored the interactions of simple metal cations with crown ether ligands in ways that

complement the efforts of chemists working with these systems in the liquid phase. Peter's work is so widely cited by other scientists that he ranked 84th by total citations among 627,871 chemists world-wide in the interval between 1981 and June 1997. Peter was awarded the rank of Distinguished Professor in 1998. In addition to all of these accomplishments, in November 2000, Peter was named the Chemistry Department Chair effective January 2001.

Tony Haymet was also a junior faculty member at UC Berkeley before coming to the University of Utah, also in the rank of Associate Professor. His expertise is in the theory of liquids, specifically liquid water. After a few years at the university, Tony accepted a chaired professorship in his native Australia. He has since become a Distinguished Professor at the University of Houston in Texas.

The space in the new south wing made it possible to install the first departmental computer used for theoretical simulations and the appointment of a full-time staff member to supervise the computing facility. (In the late 1990's the theoretical chemists were given new facilities in the INSCC building, and the facility in the Chemistry Department was adapted to the ever-increasing demands for computation by all groups in the department.) In addition, the new wing provided space for new electronics, machine and glass blowing shops, as well as for research operations of new faculty. Although state budgets were very lean during these years, the department leadership was able to move several staff positions (e.g., in shops and instruments facilities) from soft to hard funding and to have the technical support staff take on additional financial responsibility for the operation of their facilities. Even with all of the turnover in the Chemistry department faculty, external funding continued to grow. These new faculty members also gave the department the opportunity to remodel some of the laboratory space in the North HEB.

Stan Pons succeeded Jack Simons as Chair on May 9, 1988. The appointments of Walther R. Ellis, Jr., Gary F. Holland, and Fred G. West as Assistant Professors all became effective in the spring of 1988. Walther's expertise is in bioinorganic chemistry. He and his students did some beautiful studies of the protein hemerythrin from marine peanut worms before he moved to Utah State University in 1994. Gary Holland elected to take a job with an industrial research company in Redmond, WA (near Seattle) after two years on the University of Utah faculty.

Fred West is an organic chemist with a strong interest in the total synthesis of biologically important natural products using new organic reactions discovered in his laboratory. He and Chuck Grissom [see below] founded a company that explores the use of vitamin B-12 as a "Trojan horse" for introducing anti-cancer drugs into cancer victims. The eventual commercial success of this company would benefit the University through the payment of royalties for use of patented technology invented by West and Grissom. Many Chemistry faculty members (including Christensen, Epstein, Giddings, F. Harris, Poulter, and Wang) have formed off-campus companies following this general model. Fred West's wife, Dr. Christine Brzezowski, is an admired and much-awarded teacher in the undergraduate organic chemistry program of the department.

Another very important appointment made in 1989 during Stan's brief tenure as Chairman was that of Jack Simons as the first Henry Eyring Endowed Chairholder (the Chair was not fully funded at that time). This was the first endowed professorship in the history of the Chemistry Department. The event was marked by a beautiful reception in the backyard of the Rosenblatt House (the home of the University President). Jack remarked that: "This was the most proud and appreciated I have ever felt because this honor was bestowed by my friends and colleagues and because Henry was America's premier theoretical chemist." Jack did honor to the Henry Eyring Chair both by publishing many first rate scientific papers as the chairholder and by fostering a variety of programs for students using some of the financial proceeds from the Chair endowment. When Jack elected to begin phased retirement in 1998 and resigned the Chair, it was allowed to remain vacant while additional endowment funds were solicited. The Jon Huntsman family and the L.D.S. Foundation, through the offices of Dr. Rod Brady, generously completed the funding of the chair in the year 2000. A new chairholder has not yet been appointed.

Stan Pons did his doctoral dissertation research at Southampton University, where he developed a scientific collaboration with Professor Martin Fleischmann. In the 1980's Martin was a frequent visitor to Utah and had been given a courtesy visiting professorship at the University of Utah. On March 23, 1989, a press conference was convened at the University of Utah by President Chase N. Peterson to announce the discovery by Stan and Martin of cold fusion. The euphoria and disillusionment that followed that event have been told in many subsequent newspaper articles and books. A recent 365 page book [Charles G.

Beaudette, Excess Heat: Why Cold Fusion Research Prevailed, Oak Grove Press, South Bristol, Maine, 2000] does a balanced job of recounting the story.

Stan Pons resigned from the chairmanship in mid-year to devote all of his professional time to cold fusion research, and Joel Harris unselfishly undertook the duties of Department Chairman from March 29 to September 14, 1989.

The appointment of Tom Beebe as an Assistant Professor began on January 26, 1989. Tom was a brand new Ph.D. from Pittsburgh who immediately went to the Lawrence Berkeley Labs to carry out postdoctoral research in Gabor Somorjai's laboratory. Tom's subsequent work at the university with various scanning probes investigating "molecular corrals" on solid surfaces has drawn a great deal of favorable international attention. Tom has also invested a lot of effort in the creation of a multi-user surface analysis laboratory with a wide variety of high vacuum instruments (e.g. XPS and SIMS) costing well over a million dollars.

The appointment of Charles (Chuck) B. Grissom as an Assistant Professor began on July 1, 1989. Chuck has research interests that range from biochemistry to analytical chemistry. He has made a name for himself by exploring the initiation of radical reactions by photoexcited coenzyme B-12. In 1994, he reported the first observed magnetic field effect on an enzymatic reaction.

Peter Stang began his six years of service as Chairman on September 15, 1989. Among Peter's most important accomplishments as Chairman was his resolution of the cold fusion dilemma. Stan Pons wished to be relieved of his professorial teaching duties while working full time on cold fusion research. Peter negotiated an arrangement in which Stan resigned his tenured professorship effective Dec. 31, 1990, and subsequently vacated a Research Professor position effective June 30, 1992. In November 1992 a beautiful new laboratory near Nice, France, funded by Japanese business interests was dedicated to house the continuing cold fusion research of Stan and Martin. Several years later the University of Utah sold its rights to cold fusion patents to a private company. As of June 2000, Stan Pons is no longer doing research in Nice. Stan is a French citizen and resides with his family in southern France. Martin Fleischmann, on the other hand, in the spring of 2000 was still actively exploring theories of cold fusion and gave a scientific talk at the international cold fusion conference held in Italy.

Maurine Liddiard, the Administrative Manager from 1988 to 1996, in a candid photograph with Joel Harris, in 1991.

Janet Wisniewski-Grissom was appointed to the rank of Assistant Professor on May 29, 1990. She was the first female, tenure track faculty member in the Chemistry Department. She got off to a strong start with her organic chemistry research before resigning her faculty appointment to become a student at the University of Utah Medical School. She is now an M.D. specializing in psychiatry.

In 1992 Chemistry Department faculty members were delighted to bask in the reflected glory of Professor Bob Parry, selected that year to receive the Priestley Medal of the American Chemical Society. This highest award of the American Chemical Society was conferred on Bob for his extraordinary contributions to chemistry as a researcher, teacher and leader of the international chemical community. He did not stop giving at that point to the quality of the Chemistry Department. He continued to teach large undergraduate classes through 1994 and was highly praised by his undergraduate students to the very end of his long teaching career. Thanks to the generosity of the Rod Brady family, an annual Robert W. Parry Teaching Award was established in 1990 and first given to Bill Breckenridge. The award is made each year to an outstanding teacher in the Chemistry Department.

Professor Joel Miller joined the Utah faculty in 1992. Joel had been at DuPont in Wilmington, DE, where he had discovered organic molecular solids that are ferromagnetic. This research, which he has greatly expanded upon at the University of Utah with a large, well-funded research team, brought him the prestigious American Chemical Society Award in the Chemistry of Materials presented at the San Francisco ACS meeting in March 2000.

Thanh N. Truong was appointed to the rank of Assistant Professor at the University of Utah in 1992. He has developed a range of calculational tools for theoretical studies of combustion, solvation, zeolite catalysis, and interfaces. He was promoted to the rank of Associate Professor and granted tenure effective July 1, 1997. His early years in Vietnam as

a cigarette peddler, buffalo-boy and plowman before fleeing to the U.S. by boat are part of a great Horatio Alger story told on his web-site.

Thomas J. Curtiss also joined the faculty as an Assistant Professor in 1992. He designed, built and successfully tested an elaborate high vacuum instrument for isolating a neutral radical from plasma and shooting the free radical at a solid surface using inhomogeneous electric field focusing methods. He now works at the Aerospace Corporation as a research scientist.

In 1993, Professor Henry S. White was appointed to the university faculty and brought a very strong research program in electrochemistry to the University of Utah from the University of Minnesota. He is an Associate Editor of the Journal of Electroanalytical Chemistry, and his students are using scanning probe techniques, microelectrodes, and other methods to study topics as diverse as magnetic field effects in electrochemistry and transdermal drug delivery.

Peter Stang led the recruiting of two senior chemists late in his chairmanship. Cynthia (Cindy) J. Burrows and her husband, Scott L. Anderson, both joined the University of Utah faculty in January of 1995. They were previously full professors at the State University of New York at Stony Brook. Scott is a physical chemist who does experimental studies of gas phase reactions involving polyatomic molecules, clusters of molecules, and some surfaces. Scott has also made important leadership contributions to the recruiting of several new Assistant Professors.

Cindy Burrows is a noted bio-organic and bio-inorganic chemist known for studies of the intercalation of drugs and many different metal-peptide species in DNA and RNA strands and oxidation reactions of DNA by metal ions commonly found in the environment.

The Chemistry Department sustained several significant personnel losses during the 1990's. Prof. Jim Wang severed his ties to the University of Utah in favor of an endowed chair at Nebraska in September of 1990. Prof. Evan L. Allred died of cancer (at age 62) on July 8, 1991. In the course of almost thirty years on the University of Utah faculty, Evan had taught countless undergraduates in organic chemistry while publishing some excellent scientific papers on the synthesis and properties of strained ring organic molecules. Prof.

Cheves Walling retired from the faculty in 1991. Dr. Jerry Mitchell, the long time head of the department electronics shop, passed away on March 23, 1994. Professor Walter J. (Jim) Horton died on December 17, 1994. Jim was a faculty member at the University of Utah from 1946 until 1986 with two interruptions to serve as chair of the Chemistry Department at Haile Selassie University in Ethiopia (1963-65) and to serve on the faculty of the University of Ife in Nigeria (1968-71). One of his more unusual abilities as a teacher of undergraduate organic chemistry was his facility for rapidly writing formulas and equations on the blackboard while erasing simultaneously with the other hand. For the stenographically challenged students, this posed an interesting problem. Jim had a number of outstanding Ph.D. students, including Pete D. Gardner, mentioned earlier. For many years late in his career Jim collaborated closely in research with the David Grant NMR group.

Throughout this tumultuous six-year period (1989-1995) in the history of the Chemistry Department Peter Stang kept his own research program moving ahead rapidly with the aid of a number of talented students. Their work on the synthesis and properties of so-called molecular squares particularly generated widespread interest. From 1982 through 1999 Peter also carried the heavy load of Associate Editor of the Journal of the American Chemical Society. In the spring of 2000 he traded this responsibility for the even more demanding task of being Editor-in-Chief of the Journal of Organic Chemistry. Peter has accumulated honors that include being only the fifth U.S. scientist ever awarded an honorary degree by Moscow State University, the preeminent university in Russia. In 1995, he won the University of Utah Rosenblatt Prize for Excellence (other winners of this prize from Chemistry are David Grant and Dale Poulter). Peter was named the James Flack Norris Awardee in Physical Organic Chemistry of the national American Chemical Society in 1998. In the year 2000, Peter was elected to the U.S. National Academy of Sciences. This last honor is especially

Jim Horton standing in front of the old chemistry building around 1960.

impressive since only three chemists were elected in the year 2000 and the demographics of the Academy weigh heavily against anyone being elected who does not reside either on the East or West Coast.

Utah ranked 22nd among all U.S. and Canadian Chemistry Departments in the number of publications per faculty member in the 1991 ACS Directory of Graduate Research. In 1993, the Gourman Report ranked the University of Utah Chemistry Department 22nd in graduate education nationwide. The University of Utah ranked 7th (behind Harvard, Stanford, Northwestern, Columbia, UT Austin, and Houston) in the average number of publications per faculty member in the 1993 ACS Directory of Graduate Research.

Poulter to Present

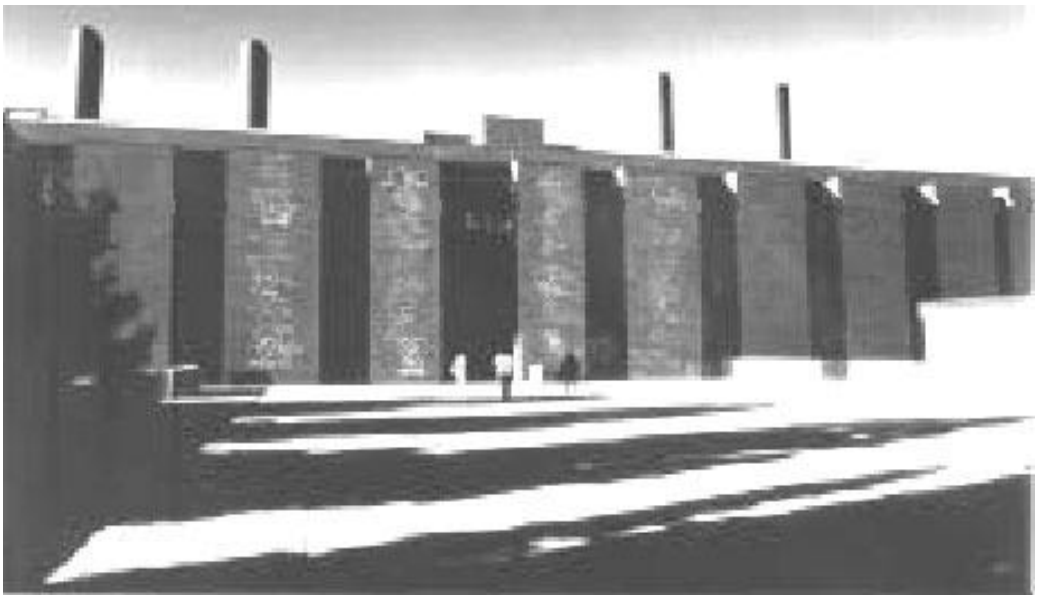
In July 1995 Professor C. Dale Poulter became the Chairman of the Chemistry Department. Dale has a large, productive research group and an international reputation for creative research. The group studies the 40-step reaction sequence that the human body uses to manufacture cholesterol. His important discoveries continue to make very positive news for the Chemistry Department. In addition, he received the Ernest Guenther Award from the American Chemical Society for his work in isoprene metabolism. Among his other duties, Dale is a Senior Editor for the Journal of Organic Chemistry and Associate Editor for the new Journal of Organic Letters, where he handles manuscripts in the developing area of bioorganic chemistry.

There have been a number of important milestones in the course of Dale's tenure as Department Chair. Finishing off the fund raising for the Henry Eyring Endowed Chair in 1999 was a major accomplishment, and the establishment of the Giddings Lectureship was another important achievement. Dale's initiation of "annual" overnight faculty retreats to brainstorm new directions for the department promises to have valuable long-term effects. For instance, we are now getting better control of seminar scheduling that at one recent point threatened to inundate the department with multiple seminars almost every working day. The department also survived the transition from academic "Quarter" to "Semester" scheduling in Autumn, 1998 with very few hiccups. Bill Breckenridge and Dave Grant are numbered among heroes of this sometimes-divisive event in the history of the University.

The department sustained a major blow when Professor J. Calvin Giddings died at age 66 on October 24, 1996. Cal was internationally known for his many contributions to chromatography and the broader field of separation science. He was the author or co-author of over 400 scientific publications and the editor of thirty-two books. Cal pioneered classes focused on environmental issues before these concerns became widely fashionable. He was also an indefatigable mentor of many graduate research students who learned from him the intricacies of various forms of chromatography, including field flow fractionation (FFF), a concept that Cal invented which became his primary identifier late in his career. Over the years he raised a great deal of federal research money. In another dimension, as a younger scientist Cal was renowned for his skiing and daring rock climbing. In later years he

persisted in his enthusiasm for outdoor adventure with kayaking trips in the U.S. and on the Apurimac River in South America, and still later he got into mountain bike riding.

Professor Austin L. Wahrhaftig, about whom much has already been written above in this history, passed away on November 11, 1997.



View of the South Wing of the HEB in 1996, the week of graduation. As a going away present several anonymous undergraduate students clandestinely rappelled from the roof of both wings of the HEB in the middle of the night and decorated the walls and walkway with numerous chemical equations and figures using chalk. The trick was repeated again in 1997.

Professors Bill Epstein and Frank Harris retired from the Chemistry Department faculty in 1998 and Wes Bentrude began phased retirement in 1998. The daunting challenge faced by the Department Chairman and the faculty is to hire new faculty members to get the teaching job done while also improving the quality of the research program in the department. This problem is aggravated by the growing difficulty of competing with other excellent departments who in some cases can throw as much as a million dollars in so-called start-up funds at a brand new Assistant Professor. These start-up funds were once very modest. Ted Eyring was given $7,000 to establish his research program when he was hired as an Assistant Professor in 1961. In the intervening years there has been a steady inflation of the dollar not commensurate with the jump from $7,000 to the presently prevailing start-up package cost at the University of Utah of $300,000 to $600,000 dollars. In Utah, the start-up money comes almost entirely from "returned overhead" on federal research grants. In other words, if a faculty member secures a research grant from the Department of Energy in

the amount of $100,000, the University as “overhead” holds about $33,000 of that money back. It is this money that funds start-up packages for new faculty. The reason for injecting this budgetary pessimism into a "history" is that it helps the reader to make sense of the heavy emphasis of this history on who has been hired and who has retired, or otherwise left.

Before leaving the topic of research funding, we should draw attention to the October 30, 2000 issue of Chemical Engineering News. On page 58 of that issue the University of Utah is ranked 26th (in the year 1998) among universities and colleges in the United States with the most federal support for chemical research and development. That is up from a ranking of 34th in the previous year, 1997.

As chair, Dale Poulter has been the leader in the recruiting of several new faculty members. Assistant Professors Peter Beal and Sheila David joined the faculty in July 1996. Sheila is a bioinorganic chemist who brought an active research program from U.C. Santa Cruz, where she had taught for several years. Peter Beal came to the University of Utah from a postdoctoral research stint at Harvard. He is a bioorganic chemist interested in how small molecules interact with nucleic acids and proteins. They have become a husband and wife team since joining the University of Utah faculty.

Professor Gregory A. Voth came to the University of Utah in 1997. He was previously a professor at the University of Pennsylvania. At the "U" he has assembled a very large group of co-workers who are housed in the new INSCC building. Greg is the Director of the now-formalized Henry Eyring Center for Theoretical Chemistry and spends his very large federal research budget on fundamental theoretical studies of the dynamics of complex condensed phase systems.

More recent arrivals at the University of Utah include the following Assistant Professors: Matthew S. Sigman (1999), an organic chemist who came from a postdoctoral research experience at Harvard; Eric L. Hegg (1999), an inorganic chemist who came from a postdoctoral appointment at the University of Minnesota; John C. Conboy (2000) who was most recently a postdoctoral researcher in analytical chemistry at the University of Arizona.

An obvious deficiency of the above record is the focus on faculty rather than on former students. There is no easy remedy to this problem. Many of our former undergraduate, graduate, and postdoctoral students have gone on to spectacular careers in a broad range of professions. One of the few reliable mechanisms for getting reports of

successes of former students is through their generous donations to the Henry Eyring Endowed Chair and other department Development Funds. W. Hoyt Andersen (Ph.D. 1952), Carlos M. Bowman (Ph.D. 1957), Melvin C. Cannon (M.S. 1938), David T. Chuljian (Ph.D. 1984), Bradley W. Cromar (B.A. 1982), Edward M. Eyring (Ph.D. 1960), David M. Grant (Ph.D. 1957), Taejon Han (Ph.D. 1995), Chen C. Hsu (Ph.D. 1972), Kak-Choong Kim (Ph.D. 1964), Sung Wan Kim (Ph.D. 1969), Steven M. Kuznicki (Ph.D. 1980), David J. Lentz (Ph.D. 1973), Marilyn Alder Marquis (Ph.D. 1951), Kenneth W. Nelson (M.S. 1957), Bryant W. Rossiter (B.A. 1957), Arthur L. Ruoff (Ph.D. 1955), Hyung K. Shin (Ph.D. 1961), Richard P. Smith (Ph.D. 1951), Doyle C. Udy (B.A. 1943), and Dan W. Urry (Ph.D. 1964) are numbered among the alumni who have been especially generous to the Chemistry Department.

Two true stories will illustrate the adventures of many of our former students. Leonard Wojcik, a graduate student from the 1970's was and is a particularly daring pilot of private, fixed-wing aircraft. In one notable exploit in Alaska he was dropping supplies from his aircraft to other people from the Chemistry Department on the ground who were participating in a climbing expedition. Leonard was the only person on board the plane and was pushing supplies out the door of the plane when the aircraft crashed breaking both of Leonard's legs.

Doug Gordon, a member of Joel Miller's research group, in his element on the Snake River in 1997.

The 1990's saw one of our graduate students, Doug Gordon, killed while participating in a National Geographic Society sponsored kayaking expedition on the Tsangpo River in southeastern Tibet. A book about the ill-fated adventure is soon to be published nationwide. Gordon was a graduate student working toward a Ph.D. in Joel Miller's research group. These two true stories will make the casual reader appreciate that University of Utah

chemists constitute a broader, more adventurous cross-section of the general population than many people would imagine.

The University of Utah Chemistry Department has grown significantly in the last half century and continues to do so. Professor David Grant is now leading an effort to secure funding for new construction that would double the size of the South Wing of the HEB. This facility will be needed to accommodate the growing number of students and faculty in the Chemistry Department. Here's to another half century of groundbreaking research, illustrious faculty members and scientifically gifted students!

Ph. D. Degrees Awarded 1947 to 2000

2000	BASAME, Solomon Belangedi	BATH, Bradley B.
	BLAGG, Brian Scott Jonathon	FAN, Jun
	GRIFFIN, James Brian	HARPER, James Kimball
	JI, Quin	JOHNSON, Michael Andrew
	KULSOMPHOB, Vichien	LANGENBERG, Jon Douglas
	LEUNG, Allen Wai-Kwong	MEYER, Wayne E.
	PORELLO, Silvia	PUGH, Mark Lowell
	RADISKY, Evette Sanborn	RITTENBERG, Durrell Kerry
	ROTHSCHOPF, Gretchen Katherine	STANLEY FERNANDEZ, Suzanne Marie
	WANG, Yong	WILLIAMS, Scott D
1999	ALVEY, Luke Jonathan	AWADA, Mohamad
	BASIR, Yousef Jamil	BELL, Richard Lee
	CAO, Wen-Jie	DUNCAN, Wendell Thomas
	GRIER, Mark Charles	JARSTFER, Michael Bruce
	LI, Xiang-Yi	LI, Zhi
	MANSON, Jamie L.	McDOUGAL, Owen Michael
	OLENYUK, Bogdan Z.	OLSON, Lydia Gayle
	PERSKY, Neal E.	RAGSDALE, Steven R.
	SALAZAR, Michael Ryan	SHIELD, Stephanie Renee
	TAYLOR, Craig M. V.	VAN HORN, Jon David
	VOGT, Andrew Dale	WAGER, Travis T.
	WANG, Hong	WEIBEL, Michael Andrew
	XU, Yaping	
1998	AMANN, Clare Marie	BELL, Robert L., Jr.
	BENDER, John Anthony	BENNETT, Brian Kieth (sic)
	BRANDON, Erik J.	BRUGH, Dale Jason
	BUSCHMANN, Wayne E.	CAO, Shibai
	HANSEN, Richard Lloyd	HATCHETT, David Wayne
	LEE, Hoo-Keun	MURCH, Paul Erwin
	NOWORYTA, Jerzy Piotr	ROBERSON, Mark Jeffrey
	STARK, Gene Albert	STEVENSON, Keith J.
	TOMASZEWSKI, Robert	WHITEFORD, Jeffery Alan
	WILLIAMS, John Mark	
1997	ANDERSON, Mark Alan	BENDERSKII, Alexander V.
	BHANTHUMNAVIN, Worawan	CAO, Danh Huu
	HAHN, Frederick Mark	KAUP, John Gerard
	KIM, Kristine Mi-Kyeung	KIPLINGER, Jaqueline Loetsch
	LACY, William Bryant	LLOYD, Christopher Robert
	LYON, Vance Andrew	MASSICK, Steven Michael
	McHARDY, Stanton Furst	MILLER, Michael Eliot
	MORE, Michelle Birke	ORR, Edward C.
	PEREZ, Ronelito Josue	SHI, Yanlong
	TJELTA, Brenda Lynn	WANG, Zhaolin
	WENZLER, Lisa Ann	YEH, Ren-Hwa
	YI, Eugene C.	
1996	ARNOLD, Bradley Ray	CASSIDY, Pamela Denise
	CHASE, Charles E.	FABBI, Jacqueline Carlene Pinegar
	FISTER, Julius Camilus	FOSSETT, Martin Emerson
	GLAESKE, Kevin W.	GONZALES, Nick O.
	HAN, Taejoon	HAYNES, Christopher Lee
	HSU, Mao-Lin	
1996	HUANG, Dahai	IULIUCCi, Robbie James
	KLINGBERG, Detlef	KRISHNAMURTHY, Dhileepkumar
	LOOMAN, Steven Donald	LOTT, William Berry
	NEFEDOVA, Veronika V.	OVCHINNIKOV, Mikhail A.
	PATRICK, David Lynn	REN, Feiyan
	RUSSON, Larry Maynard	SAVIN, Kenneth A.
	SOMMERFELD, David A.	TESTER, Richland Wayne
	WU, Wenping	XU, Yuehong
1995	ANDERSON, Karen Lynn	ARRINGTON, Caleb Anthony
	CAMBRON, Robert Thomas	CHEN, Yumin
	DOCKERY, Kevin	DUH, Der-Ming
	GEE, Richard Hayes	GUNAWARDENA, Kushlani
	HARKINS, Timothy	HWANG, Chi-Ching
	KICKEL, Bernice Louise	MANSUETO, Edward Sergio
	MARTINS, Laura Jean	PALANI, Anandan
	SODERQUIST, Arlen	TARBET, Kenneth H.
	WANG, Haibo	WANG, Yan

	WILSON, Anne Marie	
1994	BEHM, Jane Marie	BOTCHER, Tod Robert
	BROWN, Russell A.	BUFFIN, Brian Patrick
	CALKINS, Trevor Lee	CHEN, Anjun
	CHEN, Chien-I Peter	DALLESKA, Nathan F.
	FISHER, Peter Virgil	GUNAWARDENA, Gamini Upul
	HARRISON, Roger George	HINKLE, Robert James
	JIANG, Yong	LEAVITT, Andrew James
	LEE, Jeonghee	LEVER, David C.
	MURRY, Jerry A.	NAIDU, B. Narasimhulu
	RABKE, Carol Elizabeth	RANER, Gregory Martin
	SU, Chen Xing	TARKARNPRUK, Wimonrat
	TYKWINSKI, Rik	WAITE, Scott William
	WILLIAMSON, Bobby L.	
1993	ANDERSON, Stephen Gee	CHRISTENSEN, Dale J.
	CRITTELL, Charles Michael	FUH, Chwan Bor
	HUANG, Yande	HUGHES, Craig Dale
	LIU, Guang Yue	LIU, Min-Kuang
	TAGUE, Thomas Joseph, Jr.	ZHENG, Zhiwen
1992	ANDRUS, Merritt B.	BISHEA, Gregory A.
	CLEMMER, David E.	DEWEY, Michael A.
	EARL, Edward A.	HEIDECKE, Scott A.
	HELLE, Mark A.	HERNANDEZ, Ramon
	HUANG, Yo-Hsin	ISAK, Stefan J.
	KOCH, Thomas	KOURES, Antonios G.
	LIAN, Li	LU, Xiangjun
	MAVROMOUSTAKOS, Stylianos	MOON, Myeong Hee
	NILES, Stanley R.	O'NEIL, James P.
	PENG, Tang-Sheng	POSS, Mitchell J.
	SHERWOOD, Mark H.	SOUSA, Joao P. D. F.
	SPAIN, Eileen M.	WENG, Weiqing
	XIA, Jiulin	ZHONG, Zhandong
1991	ANDERSON, Lawrence Glenn	DALTON, Dennis Michael
	DUNKEL, Reinhard	FISHER, Ellen Ruth
	FU, Zhenwen	GEBLER, John Charles
	KLOBUS, Michael Andrew	LEE, Kenneth E.
	LIU, Fang	MAUTZ, Douglas S.
	QUIROS, Nelson Ivan	RODRIGUEZ, Carmen Lillian
	SONG, Linsheng	TAYLOR, Hugh Lawrence
	TONNIES, Shawn Marie Dougherty	WALDMAN, Thomas Edward
	WALLACE, Ingvar A.	WONG, Andrew Lee
	YU, Jaehoon	ZHANG, Donglu
1990	BENNETT, Robert R.	CRESSMAN, Erik N. K.
	DASCHBACH, John L.	DAVISSON, Vincent Jo
	DIBBLE, Bridget Gourley	GEORGIOU, Savas K.
	HAMRICK, Yoon Mi Lee	HAWKINS, Marvin Clair
	LEMIRE, George Wayne	LEOPOLD, Mary Frances
	MELENDEZ, Enrique	MORRISON, Richard W.
	NEWSOME, Peter Wyatt	OSTERBERG, Carolyn E.
	PARRY, Diane B.	POSTON, Pete E.
	ROMER, Duane R.	RUSSELL, Andrea E.
	SANDERS, Clifton G.	SEDLACEK, Arthur J., III
	TAFESH, Ahmed M.	TAYLOR, Scott
	WEAVER, Michael R.	ZHU, Xiao-Rong
1989	ABBOTT, Duain E.	FREEMAN, Jeffrey Willis
	FUNK, David John, II	GMEINER, William Henry
	HUANG, Zheng	KENDALL, Ricky A.
	LEE, Seungho	O'NEAL, Douglas Wayne
	SENN, Dwayne Robert	SMITH, Ronald Scott
1988	ASHLEY, Kevin E.	CARTER, Carl M.
	CURTIS, Janet C.	DATTA, Arun K.
	DAVIS, Darrell R.	DE POY, Rosemarie E.
	GEDRIDGE, Robert W.	HANSEN, Marcia E.
	HOWARD, Stephen L.	JONES, Harlan K.
	KOWALSKI, Mark H.	KRALIK, Michael S.
	LEARNED, Alan E.	MERROW, Clifton N.
	NEWBOUND, Timothy D.	OBA, Edwin Dean
	ORENDT, Anita M.	
1988	PEOPLES, H. Allan	RISEMAN, Stephen M.
	SEIDEL, Jimmy L.	SETHI, Naresh K.

	STAHL, Lothar	STREMLER, Kay E.
	TIAN, Rujiang	WANG, Jiang-Hua
	WILEY, Michael R.	ZWICK, Bill D.
1987	ADAMIC, Raymond Joseph	CARR, Jeffrey W.
	FOLEY, John Kieran	FREY, Regina Faye
	HEESCHEN, William Andrew	HELSTROM, Arlee Louise
	HIGASHI, John Michael	KORZENIEWSKI, Carol
	MORIN, Frederick George	MUEHLBACHER, Manfred
	PHILLIPS, Gregory R.	SCHIMPF, Martin Edward
	SOLUM, Mark Stephen	WILLIAMS, Michelle Elizabeth
	WOODSIDE, Andrew Bencich	
1986	BANDYOPADHYAY, Saibal	BREWSTER, Gary B.
	CASSIDY, John Francis	CHEN, Jenn-Sheng
	CROCCO, Guy L.	DIXIT, Vandana
	ENHOLM, Jonathan Eric	GUNDERSON, Judy Joy
	JANSEN, Kathryn Lynn	JENSEN, James O.
	LLOYD, Barry Alan	SNOW, Sarah Severson
	SNOW, Steven Ashley	TREHAN, Rajender
	XIANG, Tian-Xiang	
1985	BODEN, Eugene Pauling	BROWN, Mark Steven
	CHRISTENSEN, Stephen B.	CHULJIAN, David Toros
	DAVIS, Joe Matthew	FRANS, Stephen David
	KACHENSKY, David F.	LEACH, Roger A.
	McKENNA, William Patrick	MITCHELL, Mark Byron
	NEWMARK, Richard Dale	OTTESON, Aaron Dale
	OZMENT, Judith Lynn	WALLRAFF, Gregory Michael
1984	ANDERSON, Gary Harold	BEELER, Alvin Jeffrey
	BRIMHALL, Steven Lyn	GRIFFEY, Richard Holmes
	NELSON, Keith Allen	PETERSON, John Rolfe
	WILSON, David Richard	YATES, John Bennie, III
1983	ACEVEDO, Oscar Leobardo	CARTER, Christine Anita
	COOTS, Robert Jay	CYMBALUK, Teddy Henry
	FOX, Dennis Peter	GRUA, James Russell
	NICKELL, David Glenn	PELLETIER, Michael Jerome
	WHITE, Mitchell Ray	
1982	AMARNATH, Kalyani	BACIC, Zlatko
	CAVANAUGH, David B.	HEROLD, David A.
	JONES, David S.	KELLEY, Robert L.
	LEMPERT, Walter R.	LLOYD, Lindsay Bruce
	NEAL, Timothy R.	STEWART, James Anderson
	WALLACE, Susan L.	WEBB, Robert R., II
	Yang, Feng-Shyang	
1981	BLACK, Edward Partridge	DODDS, Alan R.
	DOVICHI, Norman John	KNORR, Fritz John
	LESSLEY, Sim Duane	MALMIN, Oliver Kim
	MARSHALL, David Barton	MASH, Eugene Arthur, Jr.
	NIKOLAI, William Louis, III	SHEPARD, Ronnie Lee
	THOMPSON, Michael Douglas	WIGGINS, Paul Landry
	YIM, Yung-Chang	ZILM, Kurt William
1980	FISK, Thomas Eugene	FRANK, Lenore Randall
	GARROSSIAN, Massoud	GAUDIOSO, Larry Alan
	GAUGHAN, Roger Grant	GREENWALT, Casper Charles
	KENNEY, John Willliam, III	KING, Chi-Hsien Richard
	KUZNICKI, Steven Mitchell	McHALE, Jeanne Louise
	NEUSTADT, Robert Jules	OBERLANDER, Joseph Eugene
	REDINGTON, Patrick Kay	TREPTOW, Warren L.
1979	BENNETT, Dennis W.	BIALKOWSKI, Stephen Edward
	LIN, Hao-chou	LIN, Yn-Hwang
	LIVINGSTON, Clyde Lewis	ROBINSON, Randall Eugene
	SATTERWHITE, Dennis Michael	WHITTENBURG, Scott Laird
1978	BAREFIELD, James E.	BOYD, Jack D.
	CAMAIONI, Donald M.	HAMIL, William D.
	HILEMAN, Frederick D.	KOLLIN, Werner
	LEE, Sootae	
1978	MILES, Douglas L.	NOBLE, Thomas A.
	RENLUND, Anita M.	STROEBEL, Gary G.
1977	ANDERSEN, Earl L.	ANDERSON, Albert G.
	BOWMAN, Lyle M.	FITZPATRICK, John R.
	LIESEGANG, Gerarld W.	MAYNE, Charles L.
	NIELSON, Dennis W.	SHAW, John H.

	SMITH, Larell K.	SMITH, Peter P.
	STEVENS, Don J.	WILKERSON, John L.
1976	EASTMAN, Alan Dan	HUGES, John Maurice
	MANGUM, Michael George	MUMFORD, Neal Alva
	NOGAR, Nicholas Steven	RYAN, Philip Wallace
	SANDERS, Edward Henry	
1975	DOWNING, John Wayne	FREDERICK, Gary Donnell
	HARGROVE, Robert John	KESNER, Laya Floch
	KREMER, Lawrence Nicholas, III	MYERS, Drewfus Young
	ODOM, Robert Wayne	SMITH, Richard D.
	THURBER, Timothy Craig	VESTAL, Marvin Leon
1974	ANDERSON, Richard Bruce	BECK, Boyd Reid
	CLARK, Roger Thomas	DEWEY, Harry John
	DUEBER, Thomas	HOGAN, Patrick B.
	MIN, Tae Bang	SCHMIDT, Charles L.
	SPILLNER, Charles J., Jr.	UEHARA, Yosei (Ree)
	WELCH, Melvin Bruce	WRIGHT, Randy Ben
	YANG, Frank Jiann-Fu	
1973	ALVAREZ, Vernon Leon	ANDERSON, Christopher
	ERNST, Stephen Richard	GRAHAM, Richard Charles
	GREGONIS, Donald Eugene	LENTZ, David John
	RHODES, George Wyatt	SHAW, James Russell
	SHIEH, Dean Jau	UHLIG, George Franzen
1972	BURKE, John David	CHAN, Yihlin
	EVERTON, Thomas	FLETCHER, Richard William
	FLYNN, Charles Robert	HSU, Chen-Chao
	INSKEEP, Warren Herschel	MONROE, Manus Bernard
	PANZICA, Raymond Philip	SANDBERG, Richard Garth
	STREEPER, Richard Dean	WU, Shuh-Wei
1971	AUBORN, James John	CHEONG, Kam-Khow
	CLARK, Gary James	CLOW, Roger Paul
	COLLINS, Scott William	FAERBER, Gerald Lee
	FU, Juian-Juian Liu	GRABBE, Rolland Ralph
	HERBELIN, John Morgan	JOHNSON, Albert LeRoy
	KIM, Sang-Hyung	LEUTZINGER, Eldon E.
	LIVINGSTON, Robert Condie	LONG, Robert Allen
	LYERLA, James Richard	MICHELSON, Christian Edward
	NATHAN, Lawrence Charles	OWEN, Jeffrey Daniel
	PEMBERTON, James Paul	RYU, Ji-Yong
	STRONG, Arthur Brent	
1970	BOONE, Daniel Reuben	COLE, David LeRoy
	CURRIE, Bruce LaMonte	DUCH, Michael William
	FU, Yi-chang	GHANDEHARI, Mohammad Hossein
	HILLS, Lorin Paul	HINSHAW, Jerald Clyde
	KLINGBIEL, Richard Thomas	MacKNIGHT, Allen Kent
	RICH, Larry Dean	SHUMAN, Dennis Alan
	WITKOWSKI, Joseph Theodore	
1969	BABB, Robert Massey	BENNION, Bruce Carver
	BREITLING, Shirl Morgan	DALLING, Don Keith
	DARNALL, Karen Rae	HARGIS, James Howard
	HOLOVKA, John Michael	JOHNSON, Wallace Delmar
	KIM, Sung Wan	LOVING, Ben Arthur
	McCARTHY, James Ray, Jr.	POPP, Carl John
	ROUSSEAU, Robert James	SWEAT, Floyd Walter
	THOMPSON, Gary Haughton	TOLMAN, Richard Lee
1968	LIN, Cheng-yu	LU, Wei-chen
	NELSON, John Henry	PAIK, Woon-kie
	SMITH, Richard Leon	
1967	ANDERSON, Clyde Lee	DYER, Daniel Sinclair
	EL-EZABY, Mohamed Samir	EL-SAYED, Laila Mohamed Sabet
	GARRARD, Verl Grady	JENSEN, William Denzil
	MILES, Daniel Warren	PERKINS, Richard Scott
	SONNTAG, Arch Christian	VAN LEAR, George Edward
1966	ALGER, Terry Dean	BEARD, Howart Richard
	BODÉ, Donald denby, Jr.	BROWN, Terry David
	CHENEY, Brigham Vernon	FULLER, Edward Noel
	GARVEY, Roy George	GERIKE, Peter
	HASLAM, John Lee	JENSEN, Ronald Paul
	JHON, Mu Shik	MILES, Melvin Henry
	PUGMIRE, Ronald Paul	TOU, Chieh

WHITTAKER, Mack Page

1965 CHAPPELL, Gilford Arthur — JAMES, Mar Lynn Rees
JENNINGS, Paul Wendall — KIANG, Kuo Su Chin
LIANG, Kai — LITCHMAN, William Morris
McLAUGHLIN, Donald Reed — MINER, Bryant Albert
MYERS, Marcus Norville — WANG, Yun-Liang
WOOLFENDEN, Warner Reynolds

1964 CHENG, Thomas Tein-sow — DORRENCE, Samuel Michael
FUSHIMI, Fred Chikashi — HOFF, Raymund Earl
KIM, Kak-Choong — LIN, Kingso Shingtsung
LIN, Sheng Hsien — MA, Shao-mu
TEERLINK, Wilford John — URRY, Dan Wesley
VAUGHT, David Mitchell

1963 GOKEN, Gary Lee — HIRST, Robert Charles
HOLLAND, Hans Joachim — JACKNOW, Joel
KUHLMANN, Karl Frederick — LE FEBRE, Vernon Glen
PETERSON, Robert Hampton — SCHROEDER, Kermit A.
WELCH, Garth Larry

1962 ANDERSEN, Terrell Neils — BARFIELD, Michael
BISHOP, Jay Lyman — BOYACK, James Ray
FELIX, Walter Dale — HECHT, Harry George
HIGGINBOTTAM, Harold — PAUL, Edward Gray
SCHMIDT, Donald LeRoy — SEAGER, Spencer Lawrence

1961 BEAN, Roger Marcus — FURSE, Clare Taylor
JONES, Leon Lloyd — QUISENBERRY, Richard Keith
REE, Teresa Shinye — SCHEUPLEIN, Robert John
SHIN, Hyung Kyu — TEREDA, Kazuji

1960 CARLSON, Charles M. — CHANG, Seihun
EYRING, Edward Marcus — FULLER, Evertt Jack
STOUT, Mason Gardner — TUCKER, Ross Norman
WRIGHT, Richard Dorius

1959 KEANE, John Joseph — MORTENSEN, Earl Miller
POTTER, Arnel Dewaine — ROBERTSON, Donald Edwin
SCHMELTZ, Irwin

1958 HAHN, Sang Joon — JOHNSON, Robert Le
MORREY, John R. — STEWART, George Hudson
WACKS, Morton Edward

1957 BARTON, Bruce Arlyn — BOWMAN, Carlos Morales
FUNK, Albert Gail — GRANT, David Morris
HAMMER, Charles Rankin — KELLER, Roy Alan
McGEE, Lloyd Ross — ROSSITER, Bryant William
RUETMAN, Sven Helmuth
SHORT, Glen Allison — SNOW, Richard Lewis
SPENCE, Jack Taylor — TENSMEYER, Lowell George
TICHY, Jerome R. — YANG, Kang
YUEN, George Ulysses — ZWAHLEN, Kenneth Dean

1956 BLYHOLDER, George Donald — FOSS, John Gerald
PERKINS, Ralph Hulet — PETERSEN, Joseph Claine

1955 BINFORD, Jesse Stone, Jr. — BULLOUGH, Vaughn Lynn
GEE, Kenneth Herbert — KATO, Haruto P.
KRAUSS, Morris — McCULLOUGH, Thomas Francis
MORTENSON, Edna Linnea — RUOFF, Arthur Louis
SORENSEN, David Perry

1954 DAVIS, Robert Elliott — GIDDINGS, J. Calvin
KROPF, Allen — MARCUS, Rudolph Julius
McFADDEN, William Hamilton — WALKER, Franklin Earl
WILHELMSEN, Paul Chadwick — ZOLLINGER, Joseph LeMar

1953 GARDNER, Pete Delos — GILMOUR, Hugh Stewart
HAMMER, George Nelson — RICE, George Basil, Jr.
SHULL, Charles Morell — THOMPSON, Grant
WAYRYNEN, Robert Ellis — WILDE, Kenneth Alfred

1952 ANDERSEN, Wilford Hoyt — JOHNSON, Henry Wilson
LASATER, James Arthur — NEWMAN, Stanley Ray
NIMER, Edward Lee — ROSENSTOCK, Henry Meyer
STEPHENS, C. Wayne

1951 ALDER, Marilyn Grace — CHEN, Mei Chio
COLBURN, Charles Buford — MARKER, Leon
MUELLER, Charles Richard — PARTRIDGE, William Schaubel
REYNOLDS, Richard Johnson — SMITH, Richard Pearson
WALLENSTEIN, Merril Bernard

1950	BORROWMAN, Samuel Ralph	KOLBEZEN, Martin Joseph
	KWOH, Ting-Chang	RAVVE, Abraham
	ROSSMASSLER, Stephen Atwater	WEATHERBEE, Carl
1949	FERRIS, Robert Clarke	GILMORE, Richard Clyde
	REESE, Cecil Everett	
1948	HALL, Howard Tracy	
1947	SUGIHARA, James Masanobu	

The Chemistry Department

2000 – 2014

Written by Edward M. Eyring

Assisted by Heather Burkhart

Awards to Dept. Faculty 2001-2014

2001	Stang, Peter J.	Election to U.S. Academy of Science membership
2002	Stang, Peter J.	Becomes Editor of the Journal of the American Chemical Society
2002	White, Henry	Becomes Associate Editor of JACS
2002	Poulter, Dale	Becomes Editor of the Journal of Organic Chemistry
2002	Burrows, Cynthia	Becomes Associate Editor of the JOS
2002	Harris, Joel	Becomes Editor-in-Chief of Applied Spectroscopy
2002	Stang, Peter J.	Elected to membership of American Academy of Arts and Sciences
2004	Breckenridge, Wm.	University Distinguished Scholarly and Creative Research Award
2004	Louie, Janis	NSF Career Award
2004	Poulter, Dale	ACS James Flack Norris Award in Physical Organic Chemistry
2004	Burrows, Cynthia	Bea Singer Award
2005	Harris, Joel M.	ACS Award in Analytical Chemistry
2004	Miller, Joel M.	Governor's Medal of Science and Technology
2004	Miller, Joel	Utah Award
2004	Voth, Greg	IBM Faculty Research Award
2004	Voth, Greg	John Simon Guggenheim Memorial Foundation Fellowship
2004	Sigman, Matt	Pfizer's Creativity in Organic Chemistry Award
2004	Sigman, Matt	Camille Dreyfus Teacher Scholar Award
2004	White, Henry	ACS Division of Analytical Chemistry Award in Electrochemistry
?	Breckenridge, Wm.	University Distinguished Teaching Award
?	Breckenridge, Wm.	University Distinguished Research Award
~2006	Anderson, Scott	Elected Fellow of American Physical Society
2005	Burrows, Cynthia	University Distinguished Research Award
2005	Harris, Joel M.	NSF Creativity Award
2005	Harris, Joel M.	Fellow of AAAS
2005	Poulter, Dale	Elected to American Academy of Arts and Sciences
2005	Richmond, Tom	Perlman Faculty Award for Undergraduate Counseling
2005	Louie, Janis	NSF Faculty Early Career Development Award
2005	Rainier, John D.	Chaired 39th National Organic Chemistry Symposium at Utah
2005	Simons, Jack	Rosenbladt Faculty Prize at Commencement, May 6, 2005

2005	Voth, Gregory	Designated a Distinguished Professor of Chemistry
2005	White, Henry S.	Frontiers in Chemical Research Leadership at Texas A&M University
2005	Burton, Marilyn	Chemistry Outstanding Staff Award
2005	Driscoll, Jerry	Chemistry Outstanding Staff Award
2006	Harris, Joel M.	ACS Utah Award
2007	Miller, Joel S.	2007 James C. McGroddy Prize for New Materials (Joint with A.J. Epstein)
2007	Louie, Janis	Sloan Research Fellowship
2007	Louie, Janis	Arthur C. Cope Scholar Award
2005-2006	Owens, Greg	Early Career Teaching Award (University of Utah)
2007	Pugmire, Ronald	Henry H. Storch Award (ACS Division of Fuel Chemistry)
	Simons, Jack	Elected Fellow of the American Physical Society
2007	Stang, Peter J.	2007 ACS Award for Creative Research and Applications of Iodine Chemistry
2007	Zharov, Ilya	NSF Career Award
2009	Burrows, Cynthia	Elected Member of American Academy of Arts and Sciences
2009	Poulter, Dale	Elected Member of National Academy of Sciences
2009	Armentrout, Peter	Franklin H. Field and Joe L. Franklin Award for Outstanding Achievements in Mass Spec.
2009	Keck, Gary	University Distinguished Teaching Award
2009	Molinero, Valeria	Beckman Young Investigator Award
2009	Shoemaker-Parry, Jenifer	NSF Career Award
2009	Zharov, Ilya	IUPAC Young Observer Award
2009	Miller, Joel S.	Elected Fellow of AAAS
2011	Stang, Peter J.	National Medal of Science
2012	Molinero, Valeria	Camille Dreyfus Teacher-Scholar Award
2012	Eyring, Edward	2011 Academia Governor's Medal of Science and Technology
2013	Stang, Peter J.	ACS Priestley Medal
2014	Harris, Joel M.	University Distinguished Teaching Award
2014	Keck, Gary	ACS Cope Scholar Award
2014	White, Henry	2014 Governor's Medal of Science and Technology

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I. Peter Armentrout Takes Charge

In the latter half of the year 2000, Professor Peter B. Armentrout was appointed University of Utah Department Chair of Chemistry. He earned a B.S. degree in 1975 at Case Western Reserve and his PhD. Degree in 1980 at Cal Tech. Peter has also done postdoctoral research at Bell Labs and had been an assistant professor of physical chemistry at the University of California, Berkeley for a few years before his appointment to the Utah faculty in 1987. While at Berkeley, Peter began his ion-beam mass spectrometry studies of metal molecule ions that continue to produce many national awards for Peter and his students. A recent representative example of Peter's knack for identifying and fostering extraordinary student talent is the Distinguished Alumni award made by Utah in April 2014 to Professor David Clemmer, who is located at Indiana University. David earned his PhD degree (1992) working with Peter at Utah. While working since then at Indiana, David has successfully extrapolated Peter's gas phase studies into the elucidation of protein folding issues. The challenging questions raised by Peter in student oral examinations an in visiting faculty seminars are hallmarks of what has made the science of chemistry at Utah first-class in recent years.

The election of Professor Peter J. Stang in 2001 to the U.S. National Academy of Sciences was very big news for the Department of Chemistry at Utah. Up to them there had been only one previous chemist, Josef Michl, who had begun his professional career in Utah and remained long enough at Utah to be elected an Academy member before leaving Utah. We will report the names below of more Utah Chemistry faculty members who have followed Peter Stang into the ranks of the NAS. (The late Henry Eyring and Cheves Walling were elected to NAS membership before joining the Utah Chemistry faculty, and their most notable chemical discoveries during long lifetimes were made before they moved to Utah.)

One of Peter Stang's major chemical discoveries prior to 2001 was how to synthesize molecular structures containing metal-complex units that self-assemble into tiny machines with potential practical applications. Prof. Stang is also very highly valued for his extraordinary ability to teach young people at every level how to do creative new chemical science by his example in his laboratories and his classrooms. His skillful editing of the scientific work of other chemists preparing their discoveries for publication in the most prestigious "journal" (magazine) of the chemical profession which he edits, the Journal of the American Chemical Society (JACS), continues to have a huge positive impact on the chemical profession.

Joel S. Miller, another year after year well-funded full professor, was honored at the San Francisco national ACS meeting for his pioneering development of molecule-based magnets that will eventually replace iron and other metals in practical applications of magnetic fields. His ACS recognition is called the Chemistry of Materials Award. In addition to being one of the star scientists on the faculty, Joel has an impressive collection of science toys and covers of magazines featuring his firsts in science that make a visit to his office in the chemistry building, a rewarding pit stop. (Call ahead to make sure Joel is around before stopping by. His extensive world-wide scientific collaborations may very well have him in Japan, Israel, or elsewhere temporarily if you impulsively come calling by his office.)

The transition in the chairmanship of the Chemistry Department from Dale Poulter to Peter Armentrout was seamless. Challenges of keeping the Utah faculty young and competitive for national research dollars include recruiting new faculty who teach well, write winning research proposals, and at least tolerate living conditions in drought-stricken Salt Lake City. Dale and his colleagues had added 3 green assistant professors (John Conboy [analytical], Eric Hegg [inorganic], Matthew S. Sigman [organic]) and an experienced teacher/researcher (Greg Voth [physical]) to the faculty by the time Peter Armentrout took charge of Chemistry.

In mid-summer of 2001, Millie Trevithick passed away from Alzheimer's. She was the ultra-dependable Chemistry Department secretary for many years when Dave Grant and later Ted Eyring were chairing the Chemistry Department.

To put the events noted above in context we recall that on the morning of September 11, 2001, terrorists used three commercial airliners to kill almost three thousand innocent people in New York, Washington D.C., and Pennsylvania. A dark undertone in the subsequent pages of this Chemistry history is the diminution of federal funding available for chemical education and chemical research since 9/11, arising from fiercely competing social and military national priorities. This task of chairing the Chemistry Department has become very challenging indeed, from the financial point of view subsequent to September 11, 2001.

II. The Salt Lake Winter Olympics

In 2002, the Salt Lake Winter Olympics played a dominating role in the first three months of the calendar year in the life of the Utah Chemistry Department. While skiing competitions took place in the mountains around Park City and skating events took place out beyond West Valley, the colorful parades of the opening and closing ceremonies took place in the renovated Rice-Eccles "Olympic" Stadium a few feet south of the Henry Eyring Chemistry Building.

Many University of Utah students, faculty, and staff volunteered for temporary ushering assignments which helped make the Olympic Experience a resounding success for Utah. We seemed to see everywhere windbreakers, hats, and other paraphernalia bearing Olympic symbols. Security concerns were sometimes intrusive, but Chair Peter Armentrout correctly declared "having the Olympics in our backyard was the experience of a lifetime."

On the science scene, Joel Miller's "Light-Tunable Plastic Magnet," Matt Sigman's "New Catalytic Reaction," and Henry White's "Reinvention of the Battery" all made positive technical news.

Additions to the faculty included Peter Flynn (nuclear magnetic resonance) coming from the University of Pennsylvania, Janis Louie (inorganic and organic chemistry) from Cal Tech., and Jon D. Rainier (organic synthesis) from the University of Arizona.

The Department regretted the loss arising from Wes Bentrude changing to Emeritus status, Tom Beebe moving permanently to the University of Delaware, and Fred West moving to the University of Alberta. On February 1, 2002, Distinguished Professor David M. Grant began phased retirement.

Visibility of the Department in the international chemical community was greatly enhanced by Peter Stang becoming Editor of the Journal of the American Chemical Society with Henry White as one of his Associate Editors.

Also in 2002, Dale Poulter became the Editor of the Journal of Organic Chemistry with Cindy Burrows as an Associate Editor, and Joel Harris was reappointed as the Editor-in-Chief of Applied Spectroscopy. There is no doubt that some of our best chemistry classroom teachers are made less available to our undergraduate chemistry students by this exemplary service by some of our faculty to the chemical profession. However, the quality of new research being done in the department by undergraduates, graduate students, and postdocs is greatly enhanced by having many notable chemists visiting the University of Utah editorial offices in person or electronically and keeping some of our star Utah chemistry faculty/editors apprised of the hottest new developments in chemistry. One of the key ingredients required to make Utah a hub for editing great scientific periodicals continues to be gifted reader-writers-word-processors who cheerfully convert sloppy English into scientific literature. Charlotte Sauer, Julie Westwood, … are a few of the stars at Utah who have successfully practiced this demanding witchcraft. They were or are paid by the journal in question with salaries passed through the University by the journal business offices.

On October 5, 2002, Professor Stang was inducted into membership in the American Academy of Arts and Sciences at a meeting of the Academy in Cambridge, Massachusetts. This is an honor shared by other notables such as George Washington, Benjamin Franklin, Thomas Jefferson, Alexander Graham Bell, and Albert Einstein.

Peter Armentrout continued as Chair in 2003. Thus Peter A. was running the show when Ilya Zharov, a Ukrainian doing postdoctoral research in Josef Michl's lab, accepted an Assistant Professorship in Chemistry at Utah.

In January 2003, Gretchen J. Domek was identified as a prestigious Rhodes Scholar bound for Oxford University. During her time as an undergraduate at Utah, Gretchen had done research in the Biology Lab of Professor David Goldenberg, had particularly enjoyed course work with Professors Rick Ernst and Joel Harris, and had been a member of the Utah intercollegiate cross country ski team for two years.

III. Peter Armentrout Creates Monthly Brown Bag Lunch Tradition

One of the important administrative innovations of Peter Armentrout's tour as Department Chair was the creation of monthly "brown bag lunches" attended by the full department faculty. Customarily, two faculty members are deputized by the Chair to talk for about 25 minutes each about their current research. No slides, overheads, handouts or movies are allowed. The speaker may write on the blackboard (or white board) in the course of the talk, but questions from the audience and answers from the speaker get the main emphasis of each performance. Faculty members bring their own sack lunch and drink soda water and eat cookies provided by the Chair.

This sort of preview of "amazing scientific discoveries" can be the means of encouraging publication in peer reviewed journals that head off "cold fusion" type papers before they reach the popular press.

Providing adequate space for laboratory research was a special concern in 2003. What was probably unforeseeable was how much the space needs would change as the composition of the faculty would change and the physical size of NMR high-field research instrumentation would also decrease. In spring 2003, Dave Grant and a small army of NMR research coworkers were using then state-of-the-art spectrometers with wide magnetic fields. The design of the new David M. Grant NMR facility with huge open bays for 2 new NMR spectrometers that would avoid overlap of magnetic fields moved forward.

Since the mid-1980s, Professor Arthur J. Epstein at Ohio State University and Joel Miller at Utah had been developing plastic magnets that conduct electricity. In 2003, a new kind of electronics called spintronics based on a plastic called vanadium tetracyanoethanide, or TCNE, seemed very promising. Spintronics can let computers store and transfer twice as much data per electron as in a traditional semiconductor such as silicon or gallium arsenide. A bonus is that once a magnetic field pushes an electron into a direction of spin, it keeps spinning the same way until another magnetic field causes the spin to change. This property facilitates quick access of magnetically store information during computer operation even if electrical power to the computer is switched off between uses. Thus data can be stored permanently and is available instantly at any time. Perhaps most remarkably, plastic TCNE works all this magic at temperatures as high as 100°C.

As we embark now on a consideration of what transpired in the Utah Chemistry Department in the year 2004 it may be helpful to pause first to consider briefly the dramatic change in the flavor of what was happening in the classrooms and laboratories over the half century between 1954 and 2004. In 1954, Bill Burke and his faculty of a dozen profs were teaching in what is now the Widtsoe Building on Presidents Circle and in several World War II era refurbished wooden barracks buildings. There was no refrigerated air conditioning and freshmen laboratory students sweltered in a big top floor lab with no fume hoods. All the lectures were delivered to students in poorly illuminated lecture halls with the instructors writing on blackboards. The saving grace was that the lecturers (Lloyd Malm, Jim Sugihara, Jim Horton, Henry Eyring, and Austin Warhaftig, to name a representative few) were bright minds with great enthusiasm for their subject matter. Chemical research was being carried out largely by talented graduate students. The eight Ph.D.s who graduated in 1954 included Cal Giddings who went on to become the international star of his generation of chromatographers. Cal's conception and execution of several "field flow fractionation techniques" continue to find practical applications among practical chromatographers worldwide. Returning our focus to chemistry at Utah in 1954, calculations were done by physical chemistry graduate students and postdocs on mechanical calculations and slide rules. Biochemical research was being carried our mostly in the Medical School. Only one woman, Marilyn Grace Alder, had graduated in Chemistry with a Ph.D. degree (in 1951).

In 2004, Peter Armentrout was beginning his second three-year term as Department Chair. He had a faculty of about thirty professors housed in a complex of modern, well-ventilated classrooms and laboratories called the Henry Eyring Building. Striking changes at the fifty-year mark included many more women students at every level in 2004, and four truly gifted women on the tenured or tenure track faculty. Back in 1954, the modest reputation of the Department rested largely on the research achievements of Henry Eyring and the bright young physical chemistry Ph.D.s (Ransom Parlin, Bruno Zwolinski, Rufus Lumry, Bill Cagle) who had gathered around him. In striking contrast, in 2004, the research reputation of the Department rested on the achievements of a balanced team of organic, inorganic, analytical, and physical chemists. In 2014, the balance was further improved by the research achievements of faculty members who are now focused on biological chemistry problems.

IV. The Emphasis on Biochemistry Grows

The Spring 2004 issue of the U. of Utah Department of Chemistry "Alumni Newsletter" reported important advances being made by Professor Sheila David and independently by Professor Cynthia Burrows in the understanding of DNA damage arising from oxidative chemical reactions. In the same issue of the newsletter, the use of a laser "tweezer" to hold in place particles as small as $1/100^{th}$ the diameter of a human hair in water done by Professor Joel Harris was reported. Further along in the same newsletter the assembly of a "metacluster" supercomputer (by Julio Facelli, David Grant, and Greg Voth) for advanced simulations of biological processes is also described.

Among the many news items in the Spring 2004 issue of the newsletter are the following: Professor Bill Breckenridge won the University's Distinguished Scholarly and Creative Research Award; Dale Poulter, Peter Stang, and Cynthia Burrows authored articles on chemical elements in the September 8, 2003 story "It's Elemental: The Periodic Table" in C&E News; Janis Louie won an NSF Career Award to discover the untapped chemistry of CO2; Dale Poulter won the ACS James Flack Norris Award in Physical Organic Chemistry; Jack Simons authored a 461 page book "An Introduction to Theoretical Chemistry" published by Cambridge University Press in 2003; Rosemary Laufer took early retirement from her long held post as Administrative Assistant to the Department Chair and was succeeded in the post by Debbie Olson [Considering Rosemary's excellent memory of where all the bodies are buried, some may await with anxiety the possible publication of her memoirs]; Ron Ragsdale ran out of breath at 18,000 feet of elevation on Mt. Kilamanjaro, but his daughter Krista made it to the 19,340 foot summit; Dr. Ilya Zharov, born in Russia, joined the faculty at Utah after postdoctoral work with Josef Michl in Boulder, CO; Dr. Kevin E. Ashley (Ph.D. 1987) has weathered the embarrassment of a role in the "Cold Fusion" episode and has a responsible job with NIOSH in his home town of Cincinnati, OH.

V. Faraday Christmas Lectures

Way back in December of 1981, Professors Ron Ragsdale and Jerry Driscoll started their popular version of the annual Faraday Christmas Lectures. Michael Faraday, born in London in 1791, was one of the most celebrated scientists of the 1800s for his discoveries of the laws of magnetism and his discovery of several chemical elements. As the Director of the Royal Institution, Faraday popularized science for Londoners by dazzling one hour practical demonstrations of chemical principles such as the loud ignition of large soap bubbles containing hydrogen gas. These original Faraday lecture demonstrations in the 1800s were performed by Faraday and by other scientists visiting the Royal Institution who shared Faraday's enthusiasm for science and showmanship. The Ragsdale/Driscoll version of the Faraday Christmas lectures was held for two or three consecutive evenings in the largest lecture hall of the Henry Eyring Building. Ragsdale and Driscoll wore dressy black suits, starched white shirts, and black bow ties with a tall, dressy top hat on each man's head. As the years between early December sped by, the ritual back and forth patter between Ragsdale and Driscoll portraying Faraday and his assistant steadily improved in humor and scientific insight. Ron Ragsdale and Jerry Driscoll are talented comedians. The performances were well advertised and consistently drew turn away crowds of 300+ students and friends of Chemistry. The two stars of the Ron and Jerry [Faraday] show retired gracefully after the December 2004 show, and Peter Armentrout and Chuck Wight were deputized to take their places in the December 2005 Faraday Christmas Lectures. Jerry has since retired from the

University faculty and is farming with his wife on the beautiful island of Kauai. driscoll@chem.utah.edu is still an e-mail address for Jerry.

VI. How Good is the U. of U. Chemistry Department?

Our friends with a taste for quantitative information sometimes ask: "How 'good' is the University of Utah Chemistry Department compared to other departments in the U.S. which are granting Ph.D. degrees in Chemistry?" One reasonably objective answer lies in a comparison of the following quotient Q for as many departments as you have the patience to make the calculation:

$$Q = \frac{\text{sum of federal research dollars awarded in a year to the department}}{\text{the number of tenure track faculty members in the department in the same year}}$$

The supposition here is that the author of the most innovative research proposal receives the most federal research funding. Chemical & Engineering News, July 21, 2003, page 29, reported federal research dollar awards to the University of Utah for Chemistry for the year 2001. The number of tenure track faculty members for Utah in 2002 is found on pages xiii to xix of the 2003 ACS Directory of Graduate Research. Combining these two data sets, one obtains:

Rank

1. Johns Hopkins University
2. Harvard University
3. Stanford University
4. M.I.T.
5. Cal. Tech.
6. Northwestern University
7. U.C.L.A.
8. Columbia University
9. Univ. of Colorado, Boulder
10. University of Illinois, Urbana
11. Univ. of Pennsylvania, Philadelphia
12. Univ. of Utah, Salt Lake City
13. Univ. of California, Berkeley
14. Univ. of North Carolina, Chapel Hill

The year 2001/2002 in terms of federal research funding was about average for the Utah Chemistry Department for the interval between 2000 and 2010.

The big good news of the Spring 2006 Newsletter was that Peter Armentrout was still chairing the Department and progress was being made on construction of the David M. Grant NMR Center casually called the "Gauss Hause." With the 20/20 hindsight of 8 added years of experience it is now evident in 2014 that the huge bays in the Gauss Hause designed to accommodate an 800 MHz and a 900 MHz NMR spectrometer were unnecessary. New equipment designs mitigated the detrimental effects arising from overlap of intense magnetic fields from neighboring MHz NMR spectrometers.

Prof. William H. (Bill) Breckenridge retired early from the Utah faculty on July 1, 2005 after 34 years of exemplary service as a notably successful classroom teacher of Honors freshmen chemistry classes and an internationally acclaimed researcher on "van der Waals" bonding between metal atoms (and ions) and rare-gas atoms. His Utah awards include the Hatch Teaching Prize, the University Distinguished Teaching Award, and the University Distinguished Research Award. Only two other Utah faculty members have collected all three of these top prizes. Bill won a J.S. Guggenheim Postdoctoral Fellowship to do research in France in 1985. Over the years Bill won many other awards. Bill has a long standing enthusiasm for French culture, language, and wine as well as science. In retirement Bill spends much of his time collaborating with English and French scientists in the laboratories abroad. In managing the human resources of a first rate Chemistry Department one must accept the reality that some of our most gifted scientists will move out of Utah in the middle of a brilliant career as Josef Michl, Greg Voth, and Bill Breckenridge have done. On the other hand, more of our notable faculty members have come to Utah well into their brilliant careers as, for example, Henry Eyring, Bob Parry, Cheves Walling, John Gladyz, Peter Armentrout, Cindy Burrows, Scott Anderson, Henry White, and Joel Miller. Perhaps

the single greatest strength of the Chemistry faculty has been a core of home run hitters who have performed well year after year without ever changing uniforms. The heaviest hitting all stars in this category are Peter Stang, Dale Poulter, Jack Simons, Gary Keck and Joel Harris.

In Spring 2006, the comparative newcomer to the Utah Chemistry faculty was Professor Michael H. Bartl. He had come to Utah from a 3-year postdoctoral stint in the lab of Prof. Galen Stucky at the University of California, Santa Barbara. His degree education had been entirely in his native Austria, and he spoke excellent English. He was a materials scientist. Among many strengths, he knew how to synthesize semiconductor nanocrystals and how to characterize them with advanced optical/laser spectroscopy. He uses photons rather than electrons as the main information source in studies broadly called Nanophotonics-Nanotechnology that involves sub-micron spatial resolution and picasecond time resolution.

Newsmakers mentioned in the Spring 2005 and 2006 Newsletters include:

Marilyn Burton and Jerry Driscoll received Chemistry Outstanding Staff Awards in 2005

Professor John Conboy made excellent publicity for Utah Chemistry by an imaging technique showing the distribution of chiral molecules on a solid surface [Chem. Eng. News, Feb. 14, 2005, 83(7), pp. 47-55.]

Prof. Richard D. Ernst and coworkers discovered that SF_6 is not “extremely inert”

The late Henry Eyring was honored in “The Days of ’47 Parade” (but <u>not</u> for his foot racing)

Prof. Jon D. Rainier chaired the 39th National Organic Chemistry Symposium at Utah, June 12-14, 2005

Dr. Regina F. Frey (Ph.D. 1986, with Jack Simons) is a Senior Lecturer in Washington Univ., St. Louis, MO

Mrs. Carolyn Brady with her husband Rod Brady are responsible for the annual Robert W. Parry Teaching Award

Dr. Steve Brown successfully defended his Ph.D. dissertation at Cal. Tech.

Dr. Dale Brugh (Ph.D. 1997, Morse) given tenure in Chem. Dept. at Ohio Wesleyan University

Gretchen Domek won the mark of “distinction” for her MPhil thesis concluding her 2 yr. Rhodes Scholarship

Prof. Steven M. Kuznicki (Ph.D. 1980) appointed endowed chair professor of Chem. Eng. At Univ. of Alberta

Steve Hamilton (B.S. 2005, Matt Sigman) studying medicine at Mayo Clinic on a full scholarship

Keith Jacobs (B.S. 1992) Faculty Fellow at Univ. of Montana-Missoula in business finance

Andrew J. Leavitt (Ph.D. 1994, Tom Beebe) is professor of chemistry at Univ. of West Georgia, Carrollton, GA

Dr. Mandy Hosford (Ph.D. 2005, Burrows) and Prof. Chuck Wight completed the Wahsatch Steeplechase

Ryan Julian (B.S. 1999) is faculty member at Univ. of California, Riverside

Dr. Christopher R. Lloyd (Ph.D. 1996) detects microbial contamination in food, water, and medical diagnostics

Dr. Tim Newbound (Ph.D. 1988) troubleshooter for Saudi Arabian American Oil company

Dr. Jeffrey D. Owen (Ph.D. 1971) owns a five-acre business park near Seattle, WA

Kirk Ririe (B.S. 2005) is a co-founder and CEO of Idaho Technology Inc.

Mark Thomson (B.S. 1987) earned a Ph.D. at Colorado State in 1995 and has taught since in Louisiana and Arkansas

Matthew Thorum (B.S. 2005) has begun Ph.D. work at Univ. of Illinois at Urbana Champaign

Teresa Jasmine Tuan (B.S. 2006) her precocity is described in a Daily Utah Chronicle article published Tuesday, June 8, 2006, Vol. 116, No. 7, entitled “Sixteen Going on 30”

Prof. George F. Uhlig (Ph.D. 1973, with Henry Eyring) mentor of talented undergraduates at College of Eastern Utah

Prof. Dan W. Urry (Ph.D. 1964, with Henry Eyring) entrepreneur/inventor of contractile protein-based machines

IN MEMORIAM

Melvin George Jacobsen (1924-2005) loyal shipping and receiving clerk, Chemistry Stockroom

Maria Ana Curelaru (1967-2005) (B.S. 1989) (Ph.D. 1994, Univ. Texas, Austin) began working at Kemin Nutrisurance in Des Moines, Iowa in February 2005

Robert Walter Parry

Robert Walter Parry 10/1/1917 ~ 12/1/2006 Robert W. Parry, 89, passed away December 1, 2006 in Salt Lake City, Utah. He was born October 1, 1917 in Ogden, Utah to Jeanette (Petterson) and Walter Parry. He graduated from Utah State Agricultural College in 1940 receiving a bachelor's degree in chemistry. He received a masters degree from Cornell University in 1942, and a PhD in chemistry from the University of Illinois in 1946. He married Marjorie Joyce Nelson July 6, 1945. They had two children, Robert Bryce Parry and Mark Nelson Parry. Robert Parry was a Professor of Chemistry at the University of Michigan from 1946-1969. In 1969, he came to the University of Utah as a Distinguished Professor of Chemistry, where he served in this capacity until 1997. From 1997 until his death, he was Professor Emeritus at the University of Utah. He was an extraordinary teacher, teaching chemistry to thousands of undergraduate students. In 1970 he co-authored a high school chemistry text, Chemistry Experimental Foundations, which was widely used throughout the United States. In 1972 he received the Manufacturing Chemists Award for College Teaching. He was also an excellent research scientist, directing research groups at both Michigan and Utah. His graduate students serve on chemistry faculties at universities throughout the country. In 1980, he received a Senior United States Scientist Alexander Von Humbolt-Stiftung Award, taking him to West Germany for a year. In 1980, he received the first Governor's Medal of Science from the State of Utah. His unique gift, however, was his ability to interact with people. He was a husband, father, teacher, consultant, and colleague. Robert Parry was extremely active in the American Chemical Society. He served as its president-elect in 1981 and president in 1982. He was a member of the Counsel of the American Chemical Society more than 45 years. He served on the Board of Directors of the American Chemical Society from 1973-1983. From 1969-1980, he was a member of the Board of Editors of the Journal of the American Chemical Society. He was the founding editor of Inorganic Chemistry from 1960-1963. He was chairman of the Board of Trustees of the Gordon Research Conferences from 1967-1968. In 1993, Robert Parry received the Priestly Medal, the highest honor given by the American Chemical Society, for lifetime achievement in chemistry. He received the Distinguished Service to Inorganic Chemistry Award in 1965, the Distinguished Service to Chemical Education Award in 1977, and the Utah Award for Service to Chemical Education in 1978. He received Honorary Doctor of Science Degrees from Utah State University (1985) and the University of Utah (1997). He is survived by his wife of 61 years, Marj; two sons, Bryce and Mark; and his grandchildren, Russell, Marelle, Lauren, Kristie, and Robert. He is predeceased by his parents; two brothers, Dean and Edward; and sister, Jeanette. A memorial service will be held 3 p.m. at the Evans & Early Mortuary, 574 East, 100 South, Salt Lake City, Utah, Saturday, December 9, 2006. In lieu of flowers, contributions to the University of Utah Women's Club Scholarship Fund would be appreciated.

Published in Salt Lake Tribune from Dec. 3 to Dec. 8, 2006

Excerpt of Robert W. Parry obituary in S.L. Tribune 12/3/2006

(See also “IN MEMORIAM” at back of Spring 2007 Newsletter, pp. 18,19)

The Spring 2007 Chemistry Department Newsletter:

Peter Armentrout announced that he would be succeeded as Department Chair by Henry White. He also reported that the David M. Grant NMR Center had been dedicated. With justifiable pride Peter announced the addition of Dr. Ryan Looper to the faculty. Ryan had recently been a postdoctoral research associate with Prof. Stuart Schreiber at Harvard University. Peter also noted that he had been instrumental in bringing Janis Louie, Jon Rainier, Peter Flynn, Ilya Zharov, Jennifer Shumaker-Parry, Mike Bartl, Vale Molinero, as well as Ryan Looper to the Utah Chemistry faculty. Peter also noted that Shari Zinik and Debbie Olson had been "super" staff members for him to work with.

One of the best ways of measuring the impact of the U. of Utah Chemistry Dept. faculty is to read letters from former students and colleagues. Below you will find abbreviated summaries of correspondence reported in the Spring 2007 newsletter:

Charles Finell (B.A. 1934) at age 97 [in 2007] still lives in Carmel Valley, CA. Has set up a charitable remainder trust with the Chem. Dept. as beneficiary because he was "a poor farm boy who received help with his education."

Art Ruoff (Ph.D. 1955, Henry Eyring Group) Cornell Univ. Prof. Emeritus with a spectacular list of awards for his studies of materials such as diamond and tungsten under high static pressures as high as 560 GPa.

Terry Anderson (B.S. 1958; Ph.D. 1962, Henry Eyring Group) Retired from Kerr-McGee in Oklahoma City, OK in 2001 where he was Principal Chemist for electrochemical industries; resides now in Riverton, UT.

Prof. Zoltan Schelly (postdoc 1969-70, Ted Eyring lab) long standing faculty member at U. Texas, Arlington researches transient electrophysics of unilamellar bilayer vesicles.

Prof. Milton Lee (B.S. 1971) long standing faculty member at BYU-Provo investigates microfluidics, hand-portable GC-MS, liquid chromatography, and ion mobility spectrometry.

Dr. Alan D. Eastman (Ph.D. 1975, Parry Group) retiree from ConocoPhillips in 2003, now lives in Salt Lake and consults mostly for ChevronPhillips Chemical Co. about on-line Raman and NIR spectrometry.

Dr. John W. Kennedy, III (Ph.D. 1979, Jack Simons) researches high pressure spectroscopy in diamond anvil cells, now Prof. of Chemistry and Chemical Physics at Concordia Univ., Irvine, CA.

Prof. Alec M. Wodtke (B.S. 1981) Berkeley Ph.D. in 1986 with Yuan T. Lee; Dept. Chair at U.C. Santa Barbara, 2003. Now Prof. at Geog-August Univ., Goettingen, Germany; potential energy surface for atomic H scattering on Au(s).

Prof. Joseph A. Gardella, Jr. (postdoc 1982, Ted Eyring Lab) U. of Buffalo Distinguished Professor; recipient of Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring from the NSF.

Dr. Jozsef Beres (postdoc 1982-84, Bentrude Lab) lives in Budapest, Hungary where the Beres Pharmaceutical Co. was founded in 1989. Jozsef is the director since 1993. There are 220 employees.

Dr. Bill McKenna (Ph.D. 1985, Ted Eyring Lab) was Program Manager of Light Management Films for the Display Science and Technology Center in the Eastman Kodak Research Laboratories in Rochester, NY.

Dr. Darryl Spencer (B.S. 1991) earned his PhD. In [the] lab of Nobel laureate Mario J. Molina at M.I.T. Got into software development for mass spectrometer products and in 2007 was working in Concord, Ontario.

Professor Eileen Spain (Ph.D. 1992, Morse Group) at Occidental College, Los Angeles, CA and has NSF funding for her research in the area of interfacial chemistry and recreates with 2 kids and husband in Utah.

Jane Marie Behm Arrington and Caleb Anthony Arrington (Ph.D. 1994 and Ph.D. 1995) are married and think back fondly on some of the best years of their lives in Utah.

Prof. George Richter-Addo (Postdoc 1992-93, Gladysz lab) was recently appointed Chair of the Department of Chemistry and Biochemistry at the University of Oklahoma.

Dr. Scott Waite (Ph.D. 1993, Joel Harris Lab) Director of Labs for Dept. of Chemistry at University of Nevada, Reno. Also manages safety and chemical hygiene programs and departmental instrumentation.

Dr. Andreas Fechtenkoetter (M.S., Peter Stang's lab, Ph.D. 1995, Mainz, Germany in 2001) Wife Chrys is U of U alumna in Chemical Engineering; Dept. Head for BASF Centre in Singapore in ~2006.

Dr. Christopher Lloyd (Ph.D. 1996, Ted Eyring lab) Director of R&D at MicroBioSystems in Logan, UT. Developed portable equipment to detect microbial contamination at low levels in milliseconds.

Dr. Yanlong Shi (Ph.D. 1996, Ted Eyring lab) and Ms. Lian Shao (M.S. 1998, Morse lab) They reside with their two children in Boston area. Yanlong is a fuel cell expert. Lian is a manager of a network operation center.

Dr. Edward Orr (Ph.D. 1997, Ted Eyring lab) Manufactures representative for photoresists used in patterning Si wafers in semiconductor manufacturing. Resides with wife and daughter in Vancouver, WA.

Dr. Chuck Story (postdoc 1997, Ted Eyring lab) Senior research chemistry for the Lubrizol Corporation, Wickliffe, OH, largest manufacturer of lubrient additives. Chromotographer. Amateur astronomer.

Ms. Kelly Erickson (executive secretary, 1998) Worked for Joel Miller, Ted Eyring and another faculty member. Kelly and her husband Rinar live in Henderson, NV where she acts in plays and runs marathons.

Dr. Jamie Manson (Ph.D. 1999, Joel Miller lab) Did postdoctoral work at Argonne National Lab and at Oak Ridge National Lab before joining the Chemistry Department at Eastern Washington University.

Dr. David Van Horn (Ph.D. 1999, Cindy Burrows) Did inorganic chemistry postdoctoral work at U.C. Berkeley, now an Assistant Professor at the University of Missouri at Kansas City studying heavy-metal transport in biological systems.

Dr. Rico E. Del Sesto (Ph.D. 2002) First a postdoc and now a regular staff member at Los Alamos National Laboratory studying ionic liquids, water detection, nanomaterials, and radiation detection.

Dr. Jamie K. Pero (B.S. 2002) will begin working as a Ph.D. research assistant at the Clorox Technical Center.

Dr. Coby B. Carlson (Ph.D. 2002, Peter Beal lab) Did postdoc. With Laura Kiessling, Wisconsin-Madison. Employed by Invitrogen in Madison. He and wife have two small children.

Robin Barrios Seely (B.S. 2004) Did theoretical chemistry research with Jack Simons. Now in Pharmacy School at Northeastern Univ., Boston. Glad she chose professional school.

Dr. Roger A. Leach (Ph.D. 1984, Joel Harris Lab) currently a Research Manager with Corporate Analytical Science Group at DuPont.

Dr. Robert Bennett (Ph.D. 1989) Managing Propellants, Explosions and Pyrotechnics Research Department at ATK Launch Systems (formerly Thiokol).

Dr. Brian Rasmussen (B.S. 1993) has come back to Salt Lake City and now works as a physician in town. "It's good to be back."

Dr. Michael Weibel (Ph.D. 1999) married in December 2004 and moved to Maryland in 2004 where he works in OSD's Program for Chem. & Biological Defense.

Dr. William B. Rothwell (B.S. 2000) Graduate in 2004 of Tulane Univ. Med. School. Became a third year resident at Baystate Med. Center, Springfield, MA in Medicine/Pediatrics.

Ryan D. Roberts (B.A. 2001) Pursuing an MD/Ph.D. degree, studying tumor immunology, received a 3-year training grant.

Dr. Christopher Kuehl (Ph.D. 2001) Accepted a research chemist position in the Medical Products Division of W.L. Gore and Associates in Flagstaff, AZ.

Peter W. Anderson (B.S. 2003) currently a third year medical student at Saint Louis University.

Ryan W. Hart (B.S. 20036) completed an M.S. degree at U.C. Riverside and is working at IM Flash Technologies.

Bryant Roth (B.S. 2003) now a chemist at Johnson Matthey in Salt Lake City.

Dustin Mortensen (B.S. 2004) Working for Battelle at Tooele Chemical Disposal Facility.

John Brailsford (B.S. 2004) working on a Ph.D. degree at University of California, Irvine.

Erin Umbriaco (B.S. 2004) medical student at Baylor University in Houston, TX.

Dr. Matthew Kriech (Ph.D. 2004, Conboy lab) employed by ATK Launch Systems Group working on chemical aging of solid rocket propellants.

Teresa Jasmine Tuan (B.S. 2006) selected as one of twenty-six graduating seniors inducted into the Beehive Honor Society.

Maurine Liddiard (1984) now in Durango, CO working at Fort Lewis College. She loved her time in the Chem. Dept. (running the show) more than any other job she ever had.

Gordon Hale (1985) former manager of the Chemistry stockroom and purchasing activities. At age 86 (in June 2006) he still bubbled with enthusiasm for family and traveling.

Prof. Tsutomu Masujima (former postdoc in Ted Eyring lab) still has his home in Hiroshima, Japan. Sells a nanospray top for MS analysis. Developing new type of microscope & mass spectrometer.

Prof. Bill Guillory (1985) former Chem. Dept. Chair who was instrumental in securing funding for the 2nd wing of the Eyring Bldg. Started the Hurricane Katrina Support Group. Writes books.

Louise Traper was a mainstay of the David Grant NMR research operation who has subsequently created a successful intimate apparel business for women and has a Fox Trotter horse in competition.

Prof. Jean Futrell (1986) is an international research star in ion chemistry and mass spectrometry, some of whose former graduate students at Utah have achieved great fame in their own right.

Sam Cole (former manager of Chem Computer Center, 1986-1990) now is Principal Software Engineer with CyberOptics Semiconductor in Beaverton, Oregon.

Lynell Gardner worked for Professors Armentrout, Beebe, and Eyring before graduating with a B.S. in Psychology in 1994. She now runs Alumni Relations at Weber State University.

Dr. Hua ("Bonnie") Huang (1998) (Postdoc. Ted Eyring's lab) Now a Senior Scientist at Allergan, Inc. in Irvine, CA where she characterizes protein structure using MALDI-TOF mass spectrometry.

VII. Gauss House is renamed after David M. Grant

<u>Chemistry Faculty News in the Spring 2007 Alumni Newsletter:</u>

Distinguished Prof. David M. Grant was honored Sept. 8, 2006 by having the Gauss Haus named after him.

Earlier in 2006 a special issue of Magnetic Resonance in Chemistry (Vol. 44, #3) was published honoring Dr. Grant on his 75th birthday and celebrating his many contributions to the methodology and applications of Carbon-13 Nuclear Magnetic Resonance spectroscopy. Building a great Chemistry Department is very much a community enterprise, but a strong case can be made for identifying David M. Grant as the one person who did the most to bring the Department from obscurity to true prominence.

Dr. Valeria Molinero (Ph.D. 1999, University of Buenos Aires) joined the Chemistry faculty on August 16, 2006 as an Assistant Professor. She uses powerful computational methods to model the transformation between amorphous phases and crystalline matter, teaches physical chemistry, and is making an excellent reputation for herself with path-breaking publications.

Dr. Jon Rainier was promoted to the rank of Full Professor.

Dr. John Conboy was promoted to Associate Professor with Tenure.

Dr. Janis Louie was promoted to Associate Professor with Tenure.

Henry White was elected to the rank of Distinguished Professor by other Distinguished Professors. With the approval of the central administration, College of Science Dean Pierre Sokolsky selected Distinguished Professor Henry White to be Chair of the Chemistry Department beginning July 1, 2007, following Peter B. Armentrout.

The casual reader of this history may be interested to know that the Chair of a department at the University is not required to be a Full or Distinguished Professor. David M. Grant began Chairing the Chemistry Department when he was a young Associate Professor. What a Chair must have is exemplary leadership qualities. There is no room in a first rate university for a Chair who "leads from behind."

The jump in academic rank from Assistant to Associate Professor with "Tenure" at the University of Utah is very important because the "winner" after no more than seven years of "involuntary servitude" does not need to search immediately for some other paid employment. Over the past fifty years fewer than fifteen percent of the young people joining the Utah Chemistry faculty have been denied promotion with tenure. However, it should be noted that "Tenure" does not guarantee employment until age 65 or later. If a "tenured" faculty member frequently fails to teach her/his assigned classes acceptably or does not perform faithfully other assigned duties such as committee work, counseling of students, participating in oral examinations of degree candidates, etc., she or he may be fired for cause after review by the central university administration.

Back now to the happy success stories of the Chemistry faculty reported in the Spring 2007 Alumni Newsletter:

Prof. Joel Miller was selected to appear on Thomsen Scientific's ISIHighlyCited.com because of his "exceptional citation count in the field of Material Science."

High School student Lindsay Hubley drew favorable attention to the research lab of Prof. Sheila David by winning Third Place at the 2006 International Science and Engineering Fair in Indianapolis.

TITLE IX ISSUES

On September 19, 2006, Prof. Richard Zare of Stanford University delivered the Cal Giddings Lecture on "Making It Count: Quantitation of Low-Copy-Number Proteins in Single Cells." That Spring he had written an article [Chemical & Engineering News, May 15, 2006, pp. 46-49] about ways to grow the participation of women in U.S. academic chemistry. Zare recommended collecting several "Title IX measurables" annually. In the Spring 2007 Chemistry Alumni Newsletter his "measurables" are listed with the performance for academic year 2005-2006 by the Utah Chemistry Department shown in parentheses:

Percentage of undergrads. majoring in chem who are women (102/277 or 37%)
Percentage of grad. students in chem. who are women (71/164 or 43%)
Percentage of postdocs. in chem. who are women (7/46 or 15%)
Percentage of lecturers/instructors in chem. who are women (1/3 or 33%)
Percentage of assistant professors in chem. who are women (2/5 or 40%)
Percentage of associate professors in chem. who are women (1/4 or 25%)
Percentage of full professors in chem. who are women (2/22 or 9%)

Thus among our younger faculty (assistant and associate professors), 30% were women.

On June 19, 2007, Distinguished Professor Cheves T. Walling (1916-2007) passed away peacefully in Peterborough, New Hampshire. He had tremendous favorable impact on the reputation of Chemistry at Utah before becoming an Emeritus Professor in 1991.

On July 25, 2008, Dr. H. Tracy Hall, the "father" of manmade industrial diamonds, passed away in Provo, Utah. He was Henry Eyring's first Ph.D. student, graduating from the University of Utah in 1948. Tracy became Director of Research at BYU-Provo in 1955 and fathered many diamond producing companies world-wide as well as in Utah.

The Spring National Meeting of the American Chemical Society was held in Salt Lake City for the very first time during the interval March 22-26, 2009. The Utah Chemistry Department was well represented at this meeting by students and faculty of the department delivering technical talks to the meeting attendees. Dr. Jan Hayes, the Chair of the ACS Division of History of Chemistry at the time, had secured funding for a half day symposium honoring the legacy of the late Henry Eyring. Invited speakers included Prof. Douglas Henderson (BYU-Provo), Prof. Josef Michl (Univ. of Colorado, Boulder), Prof. Dan Urry (Univ. of Minnesota and University of Alabama, Birmingham) and Prof. (Steven Kuznicki (University of Alberta, Edmonton). One of the highlights of the symposium was a graphic prepared by Dr. Amy Dambromovitz (University of Alberta) showing that Henry Eyring's 700+ scientific papers continue to generate citations in the scientific literature at a high level even thirty plus years after his death.

VIII. NIH Awards Funds for an Enlarged Chemistry Building

In the spring of 2009, the University was notified that $8M from the NIH had been awarded for construction of a major addition to the so-called "south tower" of the Henry Eyring Chemistry Building. At the time of the new NIH award it was clear that at least $10M additional [funds] would be required beyond the $8M in NIH funds to complete the project. Associate Professor Greg Owens was promptly deputized as "Director of Development" to lead this ambitious fund raising campaign.

On April 15, 2009, the College of Science hosted an "Eyring Legacy Event" in collaboration with the University Office of Development. The main event was a dinner in the Tower of Rice Eccles Stadium. Attendees included fourteen of the late Professor Henry Eyring's former research students, members of Henry Eyring's family, the three members of the LDS Church First Presidency, notable local political figures, members of the Chemistry faculty, and many other invitees.

In Fall 2009, The Catalyst Alumni Newsletter of the Chemistry Department, no volume number, had morphed into THE CATALYST CHEMISTRY NEWSLETTER, Volume 1, Number 1, Fall 2009 with a dazzling array of color photographs not found in the issue of the defunct Newsletter. Prof. Henry White was continuing as Department Chair and noted that Chemistry was still accomplishing much despite draconian State of Utah budget cuts.

The "Faculty Profile" story was about Assistant Professor Kenneth Woysechowsky who had come to Utah from upstate New York via a B.S. at Penn State, a Ph.D. at U. Wisconsin – Madison, and a postdoc. at the ETH in Zurich, Switzerland. One of Ken's research foci continues to be issues related to icosahedral capsids ("soccer balls") commonly found in viruses.

One of the challenges of having strong Utah Chemistry faculty is the inevitable competition with other strong departments for our chemists at every level of development. Examples of this problem in the history of the U. of Utah Chemistry Department abound. Josef Michl leaving Utah for Austin, Texas immediately after his election to the National Academy of Sciences is a particularly painful example. Another troubling example was the departure of Jean Futrell, bound for the University of Delaware. Just as unexpected was the decision of John Gladysz to leave in 1998 for a Chair in Germany after 16 very fruitful years elevating the prestige of inorganic chemistry at Utah. More recent disappointing losses include Greg Voth departing for the University of Chicago, the husband-wife team of Peter Beal and Sheila David decamping for the University of California, Davis, and Eric Hagg joining his wife at Michigan State University. What these and many other lateral transfers within academic chemistry have in common is more resources immediately available to the transferee at the far end of the move. If the Chair of the Utah Chemistry Department had had the endowment funds enjoyed by the Departments with which we were competing some of these unhappy losses could have been avoided. That reality makes stories about large donations to endowments particularly encouraging news.

The Thatcher Company in Salt Lake City madw a multi-year pledge to create a four-year full tuition undergraduate scholarship in Chemistry or Chemical Engineering. The first recipient was Natascha Knowlton of Magna, UT. She was also the 2009 Cyprus High School Sterling Scholar in foreign language.

Dr. Rebecca Uhlig, a practicing optometrist working in Portland, Oregon was mentored in the Utah Chemistry Department by Professor Laya Kesner. Rebecca created in 2009 the Laya Kesner Award to be given to an undergraduate chemistry major who has demonstrated teamwork and support of her/his fellow students' learning experience while in the classroom or lab.

Life sketches of three prematurely deceased Chemistry Department students are also given in the Catalyst, Fall 2009, Vol. 1, No. 1 issue. Their names are Jennifer Alexander, Christopher Nielsen, and Masaaki Tamayama.

Recognitions of Faculty Members mentioned in this Catalyst issue include the following:

Prof. John Conboy promoted to rank of Full Professor

Prof. Gary Keck received the University of Utah Distinguished Teaching Award

Prof. Joel Miller was elected Fellow of AAAS

Prof. Valeria Molinero received the Beckman Young Investigator Award

Prof. Peter Armentrout was given the Field and Franklin Award for Outstanding Achievement in Mass Spectrometry

Prof. Jennifer Shumaker-Parry received an NSF Career Award

Prof. Matthew S. Sigman received the Robert W. Parry Teaching Award endowed by the Brady Foundation

Prof. Ilya Zharov was promoted to Associate Professor and received the IUPAC Young Observer Award and was named University Distinguished Honors Professor

Debbie Olson, Department Secretary, received the W. W. Epstein Outstanding Educator Award

Prof. Holly Sebahar also received the W. W. Epstein Outstanding Educator Award

There is a gap in copies of the Catalyst (University of Utah) Chemistry Newsletter between Volume 1, Number 1, Fall 2009 and the Biannual Catalyst Newsletter, Fall 2012, that has no volume number and no issue number.

The Curie Club was invented and first convened sometime during this three-year interval. A few events from this interval in the Chemistry Department History are the following:

May 28, 2009, Dr. Bill Jack (Duke Univ. Ph.D., 1983; Native Salt Laker) visited and talked about "Polymerases and Other DNA Enzymes."

September 21, 2009, Lucy Ziurys, University of Arizona, boss of Kitt Peak and Mount Graham, Astronomical Observatories, spoke on "Molecular Spectroscopy Beyond the Solar System: A Physical Chemist's Approach to Astrochemistry."

January 21, 2010. Dr. Bethany Buck-Koehntop, Scripps Research Institute, spoke on "DNA recognition by the Methyl-CpG Binding Zinc Finger Protein Kaiso." Bethany subsequently joined the Utah Chemistry faculty.

58th ASMS Conference on Mass Spectroscopy in Salt Palace, May 23-27, 2010. Peter Armentrout spoke to an audience of about 4,000 attendees on May 23rd. Dr. Marvin Vestal (Futtrell Ph.D.) was an awardee on May 24 for a Distinguished Contribution to Mass Spectrometry. Prof. Tsutomu Masujima (former Postdoc in Ted Eyring lab) brought 20 of his coworkers from Hiroshima, Japan and spoke to a reasonable crowd on Thursday morning, May 27th about "Robotized Video-Mass Scope for Direct and Live Single-cell Molecular Exploration."

April 6, 2010, Inorganic Colloquium, Dr. Fred Hawthorne, Univ. of Missouri, Columbia, "Polyhedra Boranes in the Biomedical Area," hosted by Joel Miller.

A retirement reception for Dr. Jerry Driscoll was held on June 15, 2010. His matchless gift for classroom demonstrating chemical principles enriched all our lives. He now resides in Hawaii.

May 9, 2011, John Maier, University of Basel, Switzerland, "Electronic Spectroscopy of Carbon Chains, Rings and Ions of Relevance to Astrophysics," Host: Prof. Michael Morse.

June 25, 2011, Chair Henry White and a few others from Chemistry attended a polo match at the South Jordan Equestrian Park to see how the College of Pharmacy raises money for a new pharmacy research building. The event was finances by Claudia Skaggs Lutrell, whose daughter was one of the polo pony riders.

The lead story in the Fall 2012 Catalyst is Distinguished Professor Peter Stang receiving the National Medal of Science from President Barack Obama in September 2011 in the White House and the 2013 Priestley Medal from the American Chemical Society. The National Medal of Science is the highest U.S. honor for a scientist or engineer. The Priestley Medal is the highest honor bestowed by the ~164,000-member ACS on a chemist or chemical engineer. The medal is basically a lifetime achievement award and reflects Peter's contributions to the lively field of supramolecular chemistry in which large molecules build themselves from a mixture of pre-designed chemical building blocks.

Another story with a colorful picture in the Fall 2012 Catalyst is Miss Utah is a Chemist. Kara Arnold, Miss Davis County, was crowned Miss Utah on June 16, 2012. She graduated with a degree in Chemistry from the University of Utah in August, 2012 and aspires to become a physician. Her immediate goal was to encourage youth to discover their potential by STEPPING UP with STEM (science, technology, engineering and math).

Biannual Catalyst Newsletter, Sumer 2013 [no Volume Number]

Endowed Chair

Ragsdale Professor Charles "Butch" Atwood is using IRT ["Item Response Theory"] to determine not only which test questions are the best discriminators of student capability BUT ALSO the topics which pose the biggest learning challenges. A new 110-seat computerized testing center in the Marriott Library is the location where his students are experiencing IRT. IRT applied across individual school districts in Utah may yield the knowledge needed to focus teaching efforts and boost student performance. Also, chemical lecture demonstrations will be test by IRT to determine which demonstrations lead to an intended "Aha!" moment for students in freshman level General Chemistry.

Professor Peter Stang captures the highest award of the Amer. Chem. Soc.

This story draws attention to the long service of Prof. Stang as Editor-in-Chief of the Journal of the American Chemical Society, arguably the most prestigious periodical dealing broadly with chemistry in the entire world.

Greetings from the Chair Henry S. White

The Chair drew favorable attention to the Reese Floor for Advanced Undergraduate Laboratories and the Curie Club Active Learning Center in the new Thatcher Building. Henry expressed extreme gratitude for the support of alumni, friends, and corporations who helped make the new building a reality. He also drew attention to the new Thatcher Presidential Endowed Chair in Biological Chemistry, the Peter J. and Christine S. Stang Presidential Endowed Chair, and the Henry Eyring Presidential Endowed Chair which are critical to success in attracting and holding star teachers and researchers of chemistry to the University of Utah faculty. He announced in closing that his successor as Department Chair is Distinguished Professor Cynthia J. Burrows, a long-time faculty member and an exceptionally gifted chemist and educator.

Curie Club Members Explore the Nano World

Members and friends of the Curie Club teamed up with children and grandchildren in the C. Dale and Susan R. Poulter Lab. of the Thatcher Building to learn from their own experiments about properties of suspensions of colloidal metal particles. Prof. Jennifer Shumaker-Parry provided supervision of this laboratory event and explained that Michael Faraday in the nineteenth century was the first scientist to explain the beautiful colors achieved with suspended metal particles of different sizes.

Follow That Electron!

Professor Ryan Steele is a theorist who uses quantum mechanics and supercomputers to model the transfer of an electron to a heterogeneous catalyst when $(H_2O)n$ experiences photoxidation with transfer of a proton to neighboring molecules. A detailed 20 picosecond simulation of a 17-water-molecule cluster undergoing this reaction is estimated to require 9 years now with presently available computers. The Henry Eyring Center for Theoretical Chemistry under the direction of Professor Vale Molinero has lately been moved from the INSCC building immediately north of the Park Building a distance of roughly 200 meters to the 4^{th} floor of the beautiful new Thatcher Building. With the theoretical chemists located much closer physically to the rest of the faculty it will be interesting to see whether or not attendance at Department Colloquia grows significantly as it should. As with most human endeavors, the science of chemistry advances faster when all the participants are talking to one another.

Scholarship Honoring Prof. Edward Eyring Announced at Dept. Awards Ceremony

Dr. Craig V. Lee, DDS was the keynote speaker for the annual Department Awards Seminar. An annual “Edward Eyring Undergraduate Scholarship” was awarded for the very first time to Levon Katsakhyan marking the retirement of Prof. Eyring after more than 50 years of service. Numbered among the many generous donors of this annual scholarship were former students and faculty colleagues of Prof. Eyring.

Doors Opened at Thatcher Building in March 2013

On March 13, 2013, the Thatcher Building for Biological and Biophysical Chemistry was dedicated. The facility is named in honor of the Lawrence E. and Helen F. Thatcher family. It provides much needed space for graduate research and undergraduate teaching laboratories. Photos from the dedication ceremony are available online at http://giving.utah.edu/events/thatcher-building/.

Waters Advanced Mass Spectrometry Lab to be Dedicated in September with Symposium

On September 20, 2013, the Chemistry Department and Waters Corporation will hold a symposium on “Innovations in Biological Mass Spectrometry.” Included will be a Dedication Ceremony for the new Waters Advanced Mass Spectrometry Lab featuring the new Waters Xevo G2-S QTof instrument. Distinguished researchers speaking in the symposium will include Professor David Clemmer (Indiana University), Julie Leary (U.C. Davis), Joseph Loo (UCLA), John McLean (Vanderbilt University), Natalia Tretyakova (University of Minnesota), and Peter Armentrout (University of

Utah).
Waters Corporation has donated the new mass spectrometer for the new lab in the Thatcher Building. It is designed to be adaptable with any future innovation in the field of mass spectrometry ensuring the instrument remains current.

Professor Ryan Looper Wins Young Investigator Awards

Prof. Ryan Looper won Amgen's Young Investigator Award. This prize recognizes his research on small molecules within biological systems and includes an unrestricted research grant. Three other recipients are Sara Riseman at CalTech, Abigail Doyle at Princeton, and Scott Snyder at Columbia. In 2013 Ryan also received one of only two nationwide Young Investigator Awards given by Eli Lilly & Co. A major unrestricted research grant was included. Looper and his collaborators seek compounds that function as specific modulators of cell signaling events.

Emeritus Professor David Morris Grant Dies

On April 13, 2013, Distinguished Professor David Grant died at age 82 of natural causes. As Chair of Chemistry for a lengthy period, Dave established the practice of steering substantial departmental resources into the hands of young faculty members who were still getting their research programs started rather than into the hands of tenured faculty members who were not writing enough successful research proposals to granting agencies. Thanks to Prof. Grant's powers of persuasion, Prof. Cheves Walling and Prof. Bob Parry brought their established research reputations to Utah at a time when the Department was treading largely on the research reputation of Henry Eyring. Eventually, the enormously productive team of carbon-13 NMR spectroscopists Dave Grant gathered around him in his research lab had a broad impact on the favorable research reputations of the Utah Chemistry Department comparable to that made by the established stars (Henry Eyring, Cheves Walling, Bob Parry, etc.) who got the Utah juggernaut first rolling.

New Presidential Endowed Chair of Biological Chemistry

The Lawrence E. Thatcher family endowed a Presidential chair of Biological Chemistry in the Spring of 2013. Some fraction of the interest from the endowment may be spent each year by the Chairholder on her/his basic research, but not on personal expenses. Thus the Endowed Chair facilitates the Chairholder undertaking high risk/high potential experiments in exploring transformative new scientific ideas. Distinguished Professor and new Department Chair Cynthia J. Burrows was informed by Tom and Kathy Thatcher that she is the inaugural Thatcher Presidential Endowed Chair of Biological Chemistry.

2013 Distinguished Alumni Recognized in April

Three notable alumni of the Chemistry Department graciously consented to visit the Utah campus to accept 2013 Distinguished Alumni Awards in April 2013, visit with current students, and eat an Award dinner with members of the faculty. The three awardees ion 2013 were the following:

Dr. Dick Smith completed his Ph.D. dissertation research in the lab of Professor Jean Futrell in 1975. His research at Pacific Northwest National Laboratory (Richland, Washington) has been very fruitful. He uses advanced mass spectrometric techniques to explore proteomics, i.e. how the proteins in a single biological cell interact with one another.

Dr. George Uhlig received his Ph.D. degree in 1972 for research carries out in the lab of Professor Henry Eyring. George retired from active duty in the U.S. Air Force in 1983. He was employed by Hercules Aerospace managing research projects for several years and subsequently taught chemistry at Salt Lake Community College and the College of Eastern Utah (CEU) in Price. At the latter location he created the only science research program in the college. He retired from CEU in 2008.

Dr. Rob Webb completed his Ph.D. in 1982 as the second doctoral student of Prof. Gary Keck. At Bristol-Myers-Squibb Rob worked on drugs to treat HIV/AIDS and cancer. At Arena Pharmaceuticals he helped develop the obesity treatment named Lorcaserin. He is now Vice President at Amplyx Pharmaceuticals.

Two New Faculty Members Joined the Chemistry Department

In August 2013, Dr. Matthew Kieber-Emmons joined the faculty in the rank of Assistant Professor (seeking eventual tenure). His background was a B.S. in Chemistry from St. Joseph's University (2002) and a Ph.D. in Chemistry from the University of Delaware (2008). He came to Utah directly from an NIH postdoctoral fellowship at Stanford University. There he had combined spectroscopy measurements with theoretical calculations seeking electronic structure contributions to chemical reactivity. His mentor at Stanford was Prof. Edward Solomon. Matthew is nominally an inorganic chemistry and one of his early research topics at Utah includes design of transition metal catalysts for water splitting.

In January 2014, Dr. Caroline Saouma became an Assistant Professor of Chemistry at Utah and concurrently a member of the USTAR Alternative Energy Cluster. She is an inorganic chemist interested in the mechanism of small molecule activation. Her B.S. in Chemistry was from M.I.T. in 2005, and her Ph.D. in Chemistry was from CalTech in 2011. She has since been an NIH NRSA postdoctoral fellow at the University of Washington in the lab of Prof. James Meyer. She recently won a prestigious ACS Division of Inorganic Chemistry Young Investigator Award. Her future research interests include pathways for CO_2 fixation and various aspects of fuel cells.

Biannual Newsletter (Catalyst) Fall 2013 [no volume number]

XI Letter form the Chair by Cindy Burrows

The new Chemistry Chair, Distinguished Professor Cynthia J. Burrows, nicely summarized the "transformative impact" of Henry White's previous six years of strong leadership as Chair: 11 new professors (one third of our tenure-line faculty), including 4 women, completion of the $24M Thatcher Building, and establishment of 3 endowed chairs. ["tenure-line" is budget speak for faculty members who have already achieved tenure as well as those who are on track for tenure consideration such as newly appointed assistant professors] She welcomed to the Department of Chemistry two new assistant professors [Kieber-Emmons and Saouma] and a new Manager responsible for all fiscal matters in the Department [Reneé Laws assuming the place of Shari Zinik]. Also welcomed were Willow Toso to the Electronics Shop, and Alyssa Geisler as the new Development Officer for Chemistry.

In the same message to "Chemistry Friends and Families" Professor Burrows sketched immediate challenges facing Chemistry at Utah in 2014:

1) The State of Utah model for funding the University of Utah is transitioning from legislative appropriation to tuition-based funding. Thus encouraging students to pursue the "central science" of chemistry as a major or incidental to other studies is imperative, particularly if they are enrolled at the U. of U or are considering enrolling at the U. of U.
2) A window of opportunity for doubling the impact of a gift to the Rom and Eileen Ragsdale Scholarship Endowment Fund will close on December 31, 2014!

Unraveler: Professor Bethany Buck-Koehntop

Dr. Bethany Buck-Koehntop works in the Gauss Haus on a good-sized 800 MHz NMR spectrometer. She and her colleagues study a set of three methyl-CpG binding proteins (MBPs) called the ZBTB family. They are associated with cancer progression through their regulation of gene expression at methylated DNA sites. A combination of in vitro biophysical studies and in biological cell genomic studies are used to characterize the activities of the ZBTB family of MBPs in cancer. A goal of such studies is the identification of new biomarkers for improved cancer diagnostics.

Waters Lab Dedication and Mass Spectroscopy Symposium

On September 20, 2013 the new Waters Advanced Mass Spectrometry Laboratory in the Thatcher Building was dedicated before 120 participants with a video-feed overflow room. David Clemmer (Indiana), Julie Leary (UC Davis), Joseph Loo (UCLA), John McLean (Vanderbilt), Natalia Tretyakova (Minnesota) and Peter Armentrout (Utah) highlighted various aspects of biological chemistry revealed through mass spectrometry. Special thanks are due to Waters Corporation for their generous donation of the mass spectrometer. For photos see www.facebook.com/chemistry.utah.

John Gladysz and Janet Bluemel Fund Future Endowed Chair

John Gladysz and his wife Janet Bluemel are both notable chemistry professors at Texas A&M who have happy memories of their wedding in Red Butte Garden in 1997. Because of their striking success in academic chemistry previously in the U.S. and in Germany before settling in College Station, TX they are in a favorable financial position. They have made provisions in their estate plan for a future Endowed Chair in the Utah Department of Chemistry that will support the teaching, research, service, and professional development of the Chairholder. The Chair will be filled by an outstanding researcher in any area of organic or inorganic chemistry. Persons interested in creating a similar legacy are encouraged to contact Department Chair Cindy Burrows at 801-585-7290 or burrows@chem.utah.edu.

Marc Porter: USTAR Professor and Space Cadet

Marc Porter is a Professor of Analytical Chemistry with a USTAR appointment and research laboratory space in the James L. Sorenson Biotechnology Building. He remembers riding on a NASA weightlessness simulation nicknamed the "vomit comet" because it induced nausea in about two-thirds of passengers. He admits he got sick, but the microgravity tests of his device, a water-quality monitor, were successful. The device determines iodine and silver levels in a water sample. Both are used as sterilizing agents in space exploration. Among his many duties, Marc is Director of the Nano Institute of Utah that drives interdisciplinary nanoscale device research and collaboration in Utah. Porter's team keeps in mind a numerical goal: 10^{-24}. That is the concentration at which they would like to detect a target, equivalent to one virus particle in one liter of water.

Curie Club Hosts First Fall Event

On October 22, 2013, the Curie Club presented a panel of four experts presenting career pathways beyond the Ph.D. to about 40 attendees. Dr. Susan Poulter, Ph.D. organic chemistry and retired law school professor, spoke about how her scientific background prepared her for a career in environmental law and intellectual property issues. Prof. Jen Heemstra, Chemistry Assistant Professor, reflected on how combined experiences in academia and industry prepared her for an independent academic career. Dr. Carrie Kelley, instructor at the U. of U. and AMES, described a teaching career that has included the small college atmosphere of Concordia College, the large classrooms of general chemistry at the U. Of U., and the unusual setting of a science oriented charter high school. Dr. Carol George, the Governor's Science Advisor for the State of Utah, gave tips on opening uncommon doors by being willing to look outside her training in molecular biology and stem cell research to a career in public service. One big "take-home" message of the evening was that careers can transition over time, and one should always be open to new opportunities.

New Teaching and Research Instrumentation

A new lab designed to give U. of U. chemistry students access to the latest instrumentation opened in the Thatcher Building under the slogan "Instruments by ThermoFisher Scientific, Chemists by the University of Utah." In the lab are UV and FT-IR spectrometers, liquid (HPLC) and gas (GC) chromatography systems linked to single quadruple mass spectrometers, an automated solvent extraction system and an ion chromatograph. The idea originated with Utah graduate Arni-Elei Costa, Technical Sales Rep. for ThermoFisher Scientific. He recognized the need for U. of U. students to have lengthy access to the type of modern instrumentation they will encounter when going to work in a chemical industry. (Arni has another notable gift besides his excellent knowledge of chemistry and his engaging personality: he can jump on top of a desk from a standing position just as the late Henry Eyring could do circa 1960. See the photo on page 6 of "The Chemistry Department, 1946-2000" by E. M. Eyring.) Linda De Jesus, ThermoFisher V.P. of Global Strategic Sales, played a key role in making the instrumentation for this new student laboratory happen.

Associate Professor-Lecturer Laya Kesner Retires after Two Decades of Teaching

Laya Kesner started her career at Utah as a graduate student in 1967. She completed a Ph.D. dissertation on field flow fractionation under Prof. Cal Giddings in 1975. After a postdoctoral position with Prof. Richard Boyd in Chemical Engineering she taught chemistry for a while at Rowland Hall-St. Mark's School. Her focus on employment in Salt Lake City was dictated by her husband's faculty position in Psychology. Finally, in 1994 Laya was selected for a job in the U. of U. Chemistry Dept. updating and revitalizing the General Chemistry labs. In the years since she has taught General

Chemistry II, Environmental Chemistry, Pre-Nursing Chemistry, and Quantitative Analysis. She also pioneered freshman Service-Learning lab sources for freshman students interested in detecting Pb in paint in older homes. Her positive impact on chemistry students was noted above in a story about Dr. Rebecca Uhlig, now a Doctor of Optometry.

Dr. Marilyn Alder Marquis, First Woman to Earn a Ph.D. from the College of Science in 1951

Dr. Marilyn Alder Marquis died on August 26, 2013. She was the first woman to obtain her Ph.D. degree from the U. of U. College of Science. Her dissertation supervisor was Professor Henry Eyring. Marilyn did research on a broad range of topics for corporations and government labs including Dugway Proving Ground in the western desert of Utah. Her interests included arcplasma processing of chemicals, synthesis of tetrafluoroethylene, synthesis of polymer intermediates, and mechanism of ozone reactions. In 2012, she was honored as a distinguished alumna of the U. of U. Chemistry Department at a dinner honoring her and two other notable alumni.

New Presenters Tackled the Annual Christmas Faraday Lectures Tradition

Professors Janis Louie and Tom Richmond were deputized to prepare and perform the traditional Faraday Lectures in December 2013. They lived up to the expectations of the appreciative audience composed largely of high school students, parents, and friends of the University. As is the custom, explosions, combustions, and radical chemical reactions were the order of the day. Michael Faraday was one of the early directors of the Royal Institution located for more than 200 years in downtown London and not supported financially by the British "Royals" as one might mistakenly infer from the title of the Institution. Among the many notable scientists who have occupied the post of Director is the name of Sir George Porter, Nobel Prize Winner for the invention (with others) of flash photolysis methods of measuring fast rates of chemical reactions. Sir George gave the principal invited talk at the dedication of our Henry Eyring Chemistry Building in 1968.

Milestones in Physical Chemistry: The Potential Energy Surface of Eyring and Polanyi

In 2013, the Zeitschrift fuer Physikalische Chemie, Volume 227, Issues 9-11, pages 1207-1655 contains the classic paper, "On Simple Gas Reactions," by Henry Eyring and Michael Polanyi originally published in German in 1931, but now available in English on pages 1221-1245. Another paper of possible interest to U. of U. chemists is one on pages 1467-1490, entitled "Toward Detection of Electron-Hole Pair Excitation in H-atom Collisions with Au(111): Adiabatic Molecular Dynamics with a Semi-Empirical Full-Dimensional Potential Energy Surface" by Svenja M. Janke and 5 co-authors, including Alec M. Wodtke of Georg-August University at Göttingen, Germany. Alec Wodtke received a B.S. degree from the U. of U. Chemistry Department in 1981. Wodtke was one of two guest editors of this 446 page volume of Z. Physikalische Chem. He was also Chair of the U.S. Santa Barbara Chemistry Department before moving to Göttingen, Germany.

The Spring 2014 issue of *Catalyst*, Biannual Newsletter of the Department of Chemistry, University of Utah reports the following:

Letter from the Chair, Cynthia J. Burrows

The Department graduated 57 undergraduate Chemistry majors this spring and 33 master degree students over the past calendar year. Three former students received 2014 Distinguished Alumni Awards: Professor David Clemmer, Dr. Jerry Murry, and Mr. Thomas Thatcher (see below); Prof. Joel Harris received the University of Utah Distinguished Professor Award; Prof. Jen Heemstra was awarded a College of Science Professorship to develop a new interdisciplinary course – chemical biology; Jeff Statler received the excellence in Education Award from the LDS Student Association; Prof. Gary Keck was awarded the title of Distinguished Professor as well as Cope Scholar by the ACS. Distinguished Professor Peter Stang became the David P. Gardner Presidential Chair holder on July 1, 2014. In Summer 2014, Asst. Prof. Dr. Luisa Whittaker-Brooks will establish a solid-state inorganic chemistry program focusing on solar cell materials and nanostructure design. Asst. Prof. Michael Grünwald will join the Henry Eyring Center for Theoretical Chemistry bringing his expertise in self assembly and nanoscience.

Former Chemistry Chair and Distinguished Professor Henry White began his service as College of Science Dean on July 1, 2014. He is internationally renowned for his research in electrochemistry and last fall received the 2014 Utah Governor's Medal of Science and Technology. Cindy wrote: "Henry will lead the College of Science to great places and leap tall buildings in a single bound!"

Curie Club Sponsors Three Graduate Awards to Women Chemists

The Ronald and Eileen Ragsdale Curie Club Graduate Research Award was bestowed on Anna Wolna. She is a fifth year graduate student in Cindy Burrow's lab. Anna focuses on DNA cross-links using single-molecule nanopore technology.

Two Curie Club Graduate Teaching Awards sponsored by Anthony W. Czarnik and Craig and Linda Lee were given to Kirsten Meek and Annika Pecchia-Bekkum.

Additional Prestigious Awards to Women Chemists

Elizabeth Bess won the national Iota Sigma Pi Anna Louise Hoffman Award for outstanding achievement in research. She works in Prof. Matt Sigman's Research Lab on a problem involving directed evaluation of enzymes. Senior Elizabeth Ward is this year's American Institute of Chemists Award winner as the top graduating chemistry major. She works in Prof. David Blair's research lab. Junior Alexandra Kent won a Barry Goldwater Scholarship intended for persons pursuing a STEM research career. Alexandra works in Prof. Jenn Heemstra's research lab.

Research Spotlight on Gary Keck and Bryostatins

Professor Gary Keck reaped well deserved rewards in 2013-2014 for his remarkable achievements in synthetic organic chemistry research and his equally noteworthy success mentoring his undergraduate and graduate students of organic chemistry. The University recognized Gary's outstanding success by according him the title of Distinguished Professor. The American Chemical Society awarded him this year the honor of being an ACS Cope Scholar, a title limited to the very most successful organic chemists of their day. His first Ph.D. student at the University of Utah, Dr. Jerry Murry, was selected to be one of the 2014 three Distinguished Alumni of the Chemistry Department.

Bryostatins are found in marine organisms and for decades have been thought to have cancer fighting potential. The flagship compound, Bryostatin 1, was isolated in only gram quantities from tons of marine animals. This scarcity of a potentially life-saving molecule persuaded Gary and his research group to design and carry out a laborious total synthesis of Bryostatin 1 that was accomplished in 2011. In some encouraging *in vitro* studies Bryostatin 1 induced apoptosis (cell death) in tumor cells, but that effectiveness was not replicated in clinical trials using human patients. Gary and his team have synthesized a family of Bryostatin monologues with a view to finding what minor modifications of the parent compound may yield a more effective cancer fighter. The related compounds are given names such Merle 23 honoring Gary's friend musician Merle Haggard. (Gary's passions include chemistry, music, golden retrievers, and practical jokes.)

2014 Distinguished Alumni: David Clemmer, Jerry Murry, and Thomas Thatcher

On April 21, 2014, the successful careers of three alumni were celebrated with invited talks and an elaborate dinner at the Alumni House.

Professor David Clemmer earned a B.S. degree at Adams State College, Alamosa, CO in 1987 and a Ph.D. degree at Utah under the tutelage of Prof. Peter Armentrout in 1992. He was a postdoctoral student at the Himeji Institute of Technology in Japan and at Northwestern University in Evanston, IL. David joined the Indiana University Chemistry faculty in 1995 and Chaired that faculty from 2002 to 2006. His research accomplishments include development of methods for studying structures of complex, low symmetry systems in the gas phase and complex measures of proteins in what is now called proteomics.

Mr. Thomas Thatcher received his B.A. in Chemistry at the University of Utah in 1985, was Assistant to the President of the LDS Church Mission in Fukuoka Japan (1980-1982), and earned his MBA from Brigham Young University in 1987. Tom worked for 27 years at Thatcher Company and was General Manager of Thatcher Pharmaceutical from 1998 to 2012. He has been a member of Rotary Club since 2006, serving as the Chairman of the International Service Committee and leading humanitarian efforts in Bolivia. Currently, Tom is the founder and CEO of Intuitive Funding, a company focused on helping startups succeed.

Dr. Jerry Murry did his Ph.D. dissertation research with Professor Gary Keck, completing it in 1994. He then completed and NIH postdoctoral fellowship with Professor David A. Evans at Harvard University. In roles of increasing responsibility, he worked subsequently at Pfizer Central Research, then as Director of Process Development at Merck Research Laboratories, and then joined Amgen in 2006 where he is now Vice President Small Molecule Process and Product Development. In these leadership roles he has authored more than 50 scientific publications, contributed to more then 10 patents, and authored more than 30 regulatory filing documents including four New Drug Applications.

The Electronic Lab in its 42nd Year

One of the continuing great strengths of the Utah Chemistry Department has been, and still is, the high quality of the people manning the Electronics Shop, the Machine Shop, and the Glassblowing Shop. Here we focus on the people who presently make the Electronics Shop indispensable to our teachers and researchers in the Department and elsewhere on campus. A vigorous research program in Chemistry stretches back in time to the end of World War II in 1945. Some still remember graduate students of Professor Austin Wahrhaftig monkeying with vacuum tubes in ground floor labs of a wooden converted Army barracks building located along the east side of what is now the Widtsoe Building. Electronic gear that could not be scrounged from War Surplus was assembled by Austin's graduate students and hired undergraduate electrical engineering majors. Eventually, our Chemistry Department Electronics Lab was born in 1972, and it was a going concern when Dale Heisler, the present Director of the Electronics Shop, joined the staff in 1979. The present staff consists of Mike Scott, doing primarily repairs of equipment and computer support, Shawn Laughlin, network administrator, Dennis Edwards, department NMR service engineer, and Willow Toso, who joined the staff in 2013. As a group, these multitaskers provide data acquisition and control systems, signal conditioners, transducers, custom software, repair, and computer support for the Departments of Chemistry, Physics, Biology and other departments in the Colleges of Engineering and Earth Sciences.

Major NMR research programs that produced many widely read scientific papers based on Dave Grant's Carbon-13 expertise never would have seen the light of day without the expert assistance of Dennis Edwards, Dale Heisler, and the other indefatigable workers in the Electronics Shop.

iPhones and iPads have definitely changed (for the good) the way students and faculty much of the information they need for doing innovative research and learning new concepts and skills. However, even the newest electronic gadgetry for acquiring new data fails occasionally, and it is wonderful to have skilled troubleshooters in the Electronics Shop who will come quickly to the "bedside" of a suddenly "ailing" electronic lab experiment. As faculty and students have adapted to typing and transmitting new scientific papers to publishers and other scientists by computer, there has been a dramatic shrinkage of the size of the secretarial staff in Chemistry. Until construction and repair of electronic instrumentation for making chemical laboratory measurements is robotized and cheap, skillful employees in the Electronics Shop have better job security than just about anyone in the Chemistry Department until U.S. government agencies funding research go bankrupt.

History of Utah Chemistry Department hits the Pause Button in August, 2014.