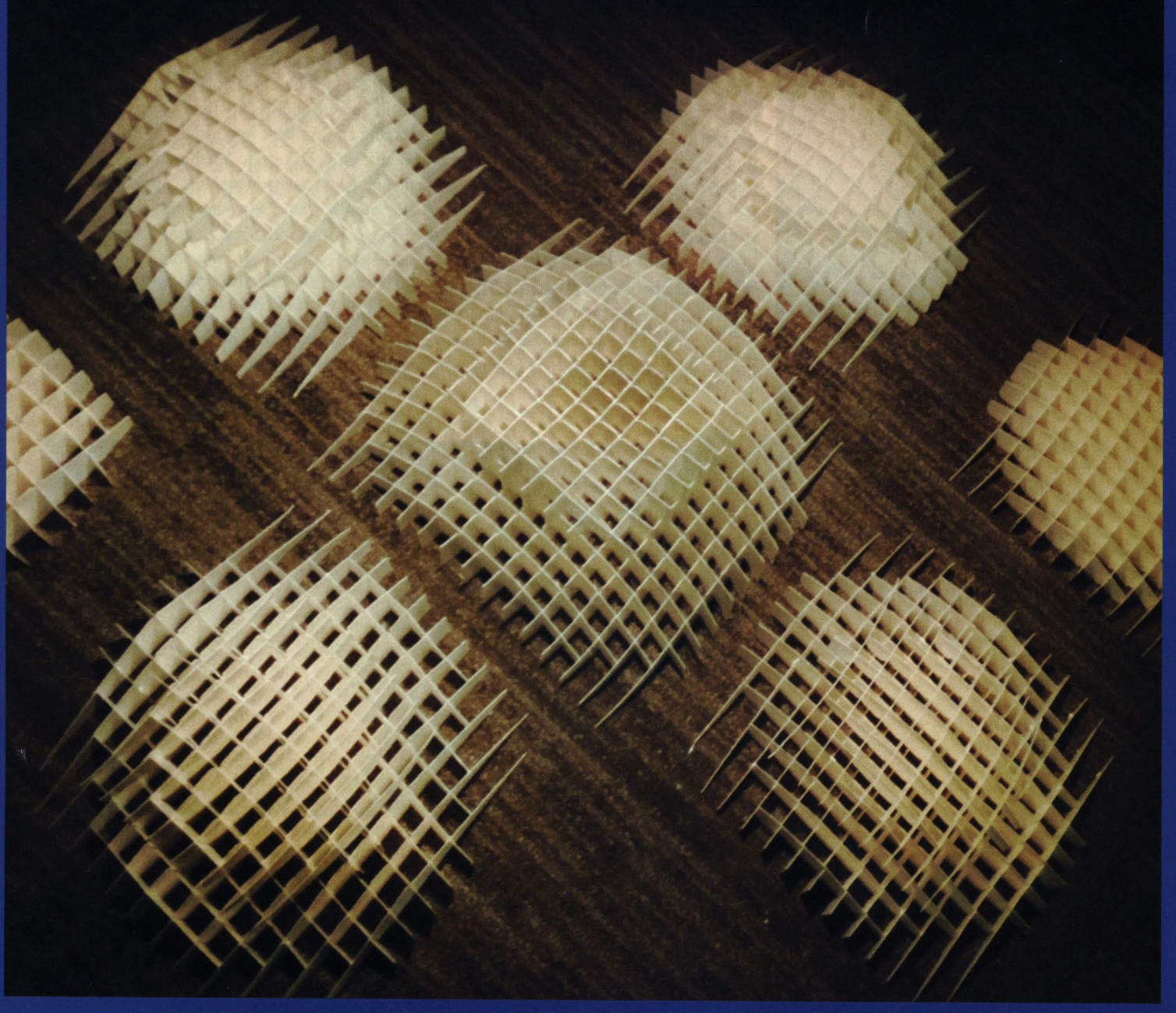
THE HEXAGON

SPRING 2016

of Alpha Chi Sigma



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SUBMISSION DEADLINES

Spring (March)	January 1
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Winter (December)	October 1

Chapters and groups: Send stories of events, and don't forget photos. Send contact information as well.
Alumni: Personal and professional news is always welcome.

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EDITORIAL

The Same and Not the Same

"As we grow, we truly become more diverse."

Kip A. Nalley, GMC,
Alpha Sigma 1990

Twenty years ago, Professor and Nobel Laureate Roald Hoffmann wrote a book titled "*The Same and Not the Same.*" He gave seminars where he called this concept "chemistry's fundamental tension." In a simple example, Hoffmann points out that stereoisomers are simultaneously "the same" and "not the same."

While the Supreme Council addressed the concept of "growth" during the installation ceremony for the *Delta Epsilon* Chapter at Boston University, I was struck by how our growth in numbers brings a diverse richness of ideas and experiences into the Fraternity.

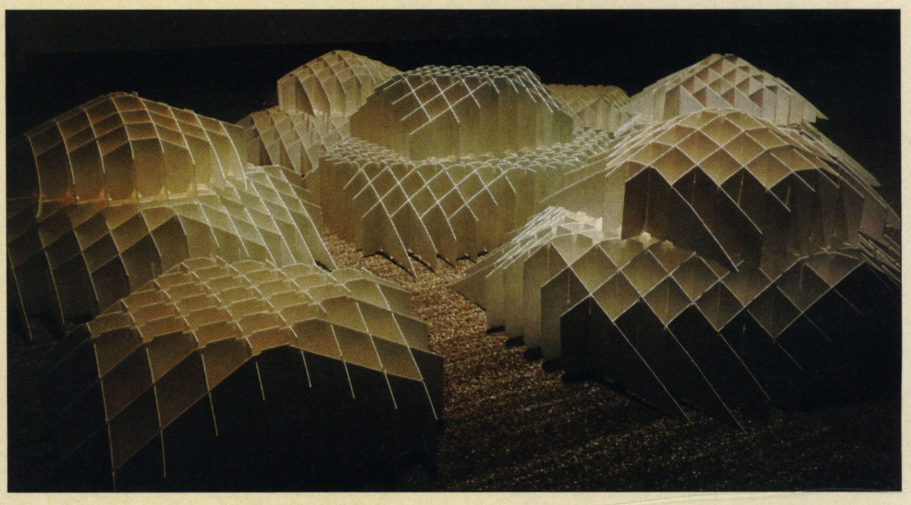
The college experience at *Delta Epsilon* at Boston University is quite different from the experience at, say, *Alpha Alpha* at Stanford. The students at a large Big Ten or SEC school have very different experiences compared with those at a smaller college or university. Within the organization, our chapters are "the same," as we are all Alpha Chi Sigma, and they are at the same time "not the same," as we all have our own settings, histories, circumstances and situations.

As we grow, we truly become more diverse as the individual experiences of any given chapter only enhances the richness and texture of the organization as a whole. This is a sense of diversity that all members can experience by taking any available opportunity to interact with one another—from Florida to Minnesota, from South Dakota to Washington, D.C.; from helping a new initiate to interacting with someone who has graduated long ago.

Everyone has their unique experience that is "not the same" as yours, and yet everyone is "the same," namely, a brother of Alpha Chi Sigma, striving for the ideals of the Three Objects.

The Objects of Alpha Chi Sigma

1. To bind its members with a tie of true and lasting friendship.
2. To strive for the advancement of chemistry both as a science and as a profession.
3. To aid its members by every honorable means in the attainment of their ambitions as chemists throughout their mortal lives.



On the Cover

"Paper Crystallography" (The 2016 Grand Prize and People's Choice winner in the "Science as Art" competition at the University of Michigan) *Sculpture and images by Lawrence Chen* (more information on the next page.)

Living the Three Objects at *Alpha Omega*

Submitted by Matthew Cline, *Alpha Omega 2012*, and Nico Villa-Roel, *Alpha Omega 2013*

At the end of every chapter meeting, we stand and say the Three Objects together. After memorizing them during our pledge semesters, we can basically say them in our sleep by now. Even if it may not take any effort to recite them, the brothers at *Alpha Omega* have really been trying to put them all into action.

The first Object is the easiest—be friends with one another. The third Object takes a little more effort. Every year, we bring in representatives from companies like General Mills and Procter & Gamble to talk at chapter about the job field and life after college. We hold weekly study parties to work on homework and projects together and get help from older brothers. And we keep contact with our alumni who are working in the field that we hope to enter. And getting those jobs after college should completely take care of the second Object: "To strive for the advancement of chemistry both as a science and as a profession."

But more can be done. Over the last year, our chapter has really stepped up our outreach programs. To advance chemistry, we need to get others involved too. As is true for other chapters, we hold a free clinic for local Boy Scouts each semester to help them earn their chemistry merit badges. Around 60 Scouts come to campus and we show off experiments and a research lab on campus. But our School Demos chair this year wanted to do more.

Matthew Cline carries out experiments at Atlanta Science Festival (image by Nico Villa-Roel).

Normally, we would try to reach out to local elementary schools and have one or two days where we would go do experiments for elementary students. But being in the heart of Atlanta made us want to expand our reach and create bigger and better projects in order to demonstrate that we are a leading organization striving for the general advancement of chemistry. Last spring, the chemistry department at Georgia Tech asked us to participate in Hands on Future Tech, an event where middle school students from the Atlanta area who are interested in STEM are able to get hands-on experience and exposure to these fields from students and professionals. Alpha Chi Sigma brothers performed experiments for these kids and we were able to share our everyday experiences as STEM students with them.

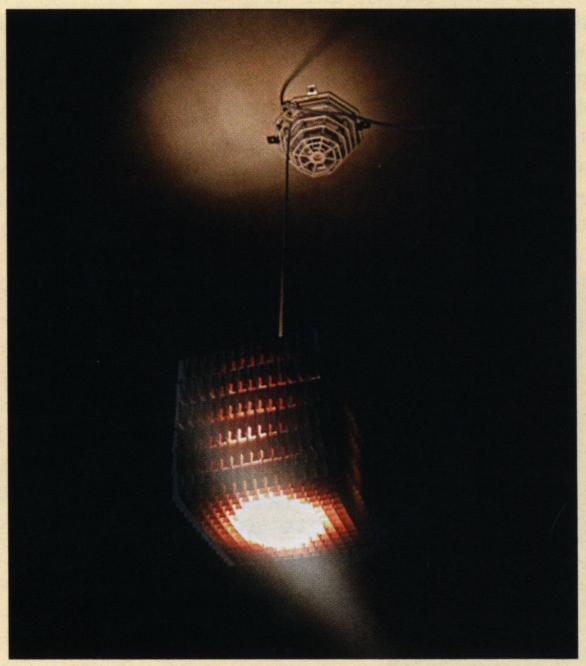
This event provided us with the contacts necessary to register for a booth at the Atlanta Science Festival: a local, weeklong celebration

(continued on page 9)

Science as Art

The University of Michigan Science Learning Center (SLC) sponsors an annual "Science as Art" competition for undergraduate students. This year, Lawrence Chen, an Honors biochemistry major in the Department of Chemistry, was the 2016 Grand Prize and People's Choice winner. Lawrence created an ideal merging of science and art with a three-dimensional representation of an X-ray diffraction pattern. With simple cardstock dividers used for packing glass vials, he wrapped a light source and then sculpted, in paper, a stunning, physical landscape of diffraction. Lawrence's written description of his work, and his photographs of the installation, all serve to enhance the experience:

"There is a source of light, and cardstock. The gaps in the constructs demonstrate how the light passes through the crystal. If one were to place a surface very close to the suspended piece, it could be seen how the light interacts with the presence and absence of material. But with distance, that pattern diffuses and dissipates. On the ground, the diffraction pattern is a representation of what one might see: geometric patterns indicating where the light has struck the surface, and where it has not. The information in its arrangement isn't immediately apparent—and so it requires some careful inspection. The materials were once a part of the packaging that held glass vials used in research labs, but have now been given a new life illustrating what might have happened to the samples it once held." *Images by Lawrence Chen*



Rediscovery of the Elements

The Rare Earths–The Last Member

James L. Marshall, *Beta Eta 1971*, and Virginia R. Marshall, *Beta Eta 2003*, Department of Chemistry, University of North Texas, Denton, TX 76203-5070, *jimm@unt.edu*

Figure 2. The Kaiser Wilhelm Institute is now the Freie Institute, located in Berlin-Dahlem, Thielallee 63—N52° 26.85 E13° 17.11. This is the Hahn-Meitner-Bau (Building): Institut für Biochemie, the laboratory where the splitting of the atom was first observed.

The final rare earth to be discovered. In the previous "Rediscovery" article,[1c] we saw how Henry Gwyn Jeffreys Moseley (1887–1915) in 1914 through X-ray analysis formulated the concept of atomic numbers; and how he concluded that there was one rare earth yet to be discovered—number 61. This element had actually been "predicted" a decade earlier—Bohuslav Brauner (1855–1935), professor of chemistry at the University of Prague, Czechoslovakia, in 1902 announced, on the basis of an anomalous atomic weight gap between the two elements, that an element should exist between neodymium (60) and samarium (62).[2d]

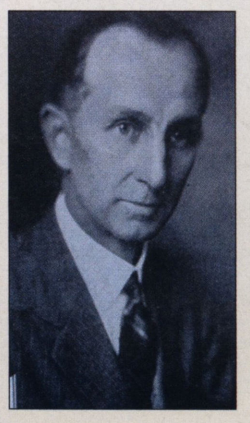


Figure 1. B. Smith Hopkins of the University of Illinois, is the only ΑΧΣ member whose announced element—illinium—appears on the Mendeleev Wall Periodic Table of the Elements in St. Petersburg, Russia (see Figure 11 on page 10).

Chemists promptly began to search in crude preparations of these two elements, hoping to find element 61 as an impurity, but during the next two decades nothing definitive was reported.[2d] In 1921 Charles James (1880–1928), the co-discoverer of lutetium in 1907 and professor at the University of New Hampshire and member of ΑΧΣ (*Mu* '11), suggested in 1921 that solubility trends of the rare earth carbonates indicated such an element existed between neodymium and samarium.[3] However, in spite of his expertise in the separation of the rare earths[1c]—he is credited with preparing the purest sample of lutetium, the last rare earth discovered in 1907—he was silent on the matter of actually isolating the intermediate element.

The discovery of illinium. Five years later "illinium" was announced in the *Journal of the American Chemical Society* by B. Smith Hopkins (Figure 1) (1873–1952; ΑΧΣ, *Zeta* '13) of the University of Illinois.[4] Hopkins had not isolated the element, but he reported that new absorption lines appeared common to the intermediate crystallization fractions of neodymium and samarium. He reported that he also was able to observe faint X-ray lines whose frequency agreed with the predicted values of element 61.

Among the myriad of spectral lines appearing for neodymium, samarium, and contaminants of other rare earths and heavy metals, a few were confirmed by German chemists[5] – and also by Charles James.[6] Both James and Hopkins had been simultaneously working on this problem, but each was unaware of the other's research.[7] James had obtained similar data several years previously,[7] but elected not to publish until he obtained more definite results. Ironically, James had been asked to referee Hopkins' announcement publication on illinium! A true gentleman,[8] James did not demand shared honors, but instead promptly endorsed Hopkins' publication. This example of "moral integrity" has been lauded by the authors of the

Figure 3. Plaques on the Hahn-Meitner Building. LEFT: "In this building of the Dahlem Kaiser Wilhelm Institute for Chemistry, the splitting of the uranium atom was discovered by Otto Hahn and Fritz Strassman." RIGHT: "In this building Lise Meitner worked 1913–1938, the co-discoverer of the splitting of the atom, and Max Delbrück, pioneer of molecular genetics, who worked with Frau Meitner 1932–1937." Max Delbrück, who migrated to the U.S., received a Nobel Prize in 1969 for discoveries concerning "the replication mechanism and genetics structure of viruses."

recent *The Lost Elements: The Periodic Table's Shadow Side*,[2] citing this as scientific professionalism at its highest: "Real integrity is doing the right thing, knowing that nobody's going to know whether you did it or not."[2d] Upon Hopkins' announcement of illinium, James quietly published his results in a less prominent journal,[6] confirming Hopkins' observations.[7]

An independent discovery—florentium. Meanwhile, across the Atlantic Ocean another claim for element 61 was made.[2d] An independent observation of the same absorption and X-ray spectra was made by Luigi Rolla (1882–1960) of the Royal University of Florence. He called his element *florencium*, later *florentium*.[2d,9] Rolla claimed he had actually performed his research two years previously, and he proved it by providing a packet of documentation he had sealed at that time—he wanted more time to prepare a sample of the element before publishing.[2d]

A contentious trans-Atlantic debate ensued as to the priority of "illinium" or "florentium."[2d] A race ensued as to who could isolate an authentic sample of element 61, but no one was able to perform the deed. Even Walter Noddack (1893–1960) and Ida Tacke Noddack (1896–1978), the geological chemistry experts who had just discovered rhenium in 1925,[1b] tried their hand at isolating element 61—but were unsuccessful. Ida Tacke Noddack, who had ingeniously prophesied nuclear fission years before Otto Hahn observed it in Berlin,[1b] suggested element 61 might be gaseous and radioactive[2d] (she turned out to be half correct—*vide infra*).

Was illinium/florentium authentic or spurious? The evidence for element 61 was very thin indeed. The X-ray lines that were "proof" of element with an atomic number of 61 appeared only as faint traces, sometimes lost in the forest of the main spectral lines, in the fractions of neodymium and/or samarium. Since an actual sample of element 61 could not be prepared, many scientists began to doubt its presence. One such person was Wilhelm Antonin Alexander Prandtl (1878–1956), at that time at the Wilhelm-Institut für Physikalische Chemie und Elektrochemie in Berlin (where Fritz Haber had been conducting research on poison gases during World War I). Prandtl, who in 1926 was simultaneously heavily criticizing the claims[2c] by the Noddacks for "discovery" of element 43 (masurium),[1b] rejected the claim of discovery for illinium.[10] Prandtl reported he could produce the "illinium" lines in the absorption spectra by simply changing the proportions of neodymium and samarium in the sample to be analyzed; furthermore he claimed the very faint X-ray lines could be produced by contaminants of barium, bromine, chromium, and platinum.

Mattauch's rule of isobars (1934). Meanwhile, theoretical considerations bore on the issue regarding element 61. Josef Mattauch (1895–1976), a researcher in mass spectrometry who succeeded Lise Meitner (1878–1968) as head of the physics department at Kaiser Wilhelm Institute for Chemistry (Figures 2,3), after she fled Germany in 1938, formulated his "Isobarenregel" (Rule of Isobars) in 1934.[11] This Rule was an empirically derived law which defined the possible combinations of stable or unstable nuclei for isobars (nuclides with the same atomic mass but different atomic numbers, e.g., $_1H^3$ and $_2He^3$). The rule states that for isobars differing by only one atomic number, if one nucleus is stable, then the other one must be radioactive. Examples: Since $_7N^{14}$ is stable, then $_6C^{14}$ must be radioactive; since $_6C^{13}$ is stable, $_7N^{13}$ must be radioactive. This rule, after 80 years, still holds true with only two minor exceptions, and has been refined and quantified on the basis of the liquid drop model of the nucleus.[12]

In his 1934 article,[11] Mattauch applied his rule to element 61, for which he predicted all isotopes would be radioactive. This conclusion follows for 61 because the elements both immediately before and after 61—neodymium and samarium—have stable isotopes for the range of the masses of isotopes of 61. Specifically, for the mass range of element 61 (centered between Nd=144.2 and Sm=150.4), either Nd or Sm has a stable isotope—neodymium has stable isotopes 142–146 and 148 and samarium has stable isotopes 147–150 and 152, thus excluding stable isotopes 142–150 of element 61. (In Mattauch's article, a similar argument is given for Noddacks' masurium, element 43,[1b] taking into account the stabilities of isotopes of its surrounding elements molybdenum and ruthenium).

Some in the scientific community of the 1930s took heed of Mattauch's rule and began to make the obvious conclusion: perhaps element 61 (as well as masurium) had not been found in nature, because it didn't *exist* in nature.[13] Even the Chair of the Chemistry Department at Illinois, William Albert Noyes (1857–1941; ΑΧΣ *Zeta* 1912), who had been championing Hopkins' claim for illinium, was beginning to have "doubts about the experimental evidence" and in 1928 asked Charles James—whom he actually previously attempted to lure to Illinois[7]—to collaborate to resolve the uncertainty of the claim of the element.[7] Regrettably, James was terminally ill and died that same year.

The status of element 61 before World War II. With no definite sample of element 61 in hand, its status was uncertain. Hopkins believed in illinium without reservation; he wholeheartedly believed that the element was there, if only in trace quantities.[7] Slowly the scientific community began to consider that since technetium had been artificially produced in 1937 and was shown to be radioactive,[1b] perhaps promethium could be artificially prepared as well. However, the situation as described by Mary Elvira Weeks stood perhaps as a convenient best guess—in the 1939 edition of *Discovery of the Elements* she reported that, "Element number 61, illinium,

the last of the rare earths, [finally] took its place in the periodic table."[9]

The Manhattan Project. World War II, with the development of the atomic bomb, created the opportunity for the artificial synthesis of element 61. A complete city—Oak Ridge, Tennessee—was built from scratch to develop fissionable and trigger materials for the Manhattan Project. The fissile materials for the bomb were the 235 isotope of uranium (U-235) and plutonium. Constituting 0.7% of the natural abundance of uranium, U-235 was separated at three facilities known as K-25 (which used the gaseous diffusion method, using different diffusion rates of UF6), S-50 (liquid thermal diffusion), and Y-12 (using calutrons, essentially huge mass spectrometers). A pilot plant for the production of plutonium was named X-10, or the Graphite Reactor (Figure 4). This was the second nuclear reactor, the first being the atomic pile at the University of Chicago (the "Fermi" pile). The Graphite Reactor went into operation on November 4, 1943. Natural neutron production in the uranium rods transformed uranium-238 into plutonium-239 (Figures 5–7). This process involved slow neutrons (decelerated while passing through graphite) which were absorbed by uranium-238, which then experienced two beta-decays to produce plutonium-239.

Other nuclear events occurred simultaneously. To understand all of these processes at X-10, fission products of uranium needed to be analyzed. Georges Urbain (1872–1938), the co-discoverer of lutetium, had once said that fractional crystallizations was the only method of merit in the search for new elements.[2b] However, now a much more efficient method of separation was needed. Fortunately, such a technique—ion-exchange chromatography—was developed by Frank Harold Spedding (1902–1984)[14] (Figure 8) using an Amberlite support and a citrate eluant with a carefully controlled pH. Ion-exchange chromatography was particularly applicable to rare earths because of the dynamic equilibrium of rare earth ions with ligands, which causes significantly different retention times of different rare elements on the specialized substrate. With this method, clean separation of the rare earths was realized.

The analysis of the rare earths was performed in a neighboring laboratory (Figure 9) by the team of Jacob Akiba Marinsky (1918–2005), Lawrence Elgin Glendenin (1918–2008), and Charles DuBois Coryell (1912–1971). They followed the travel of various fractions by tracing their radioactivity, using the pioneering method of the Curies[1a] for radium and polonium. They isolated a fraction which proved to be the new element,[15] a "long-lived" isotope (half-life of 2.6 years) which they eventually proved by mass spectrometry to have a mass of 147.[16] They went on to discover another isotope, Pm-149 (half-life 53 hours).[16,17]

Figure 4. X-10, Code name for the Graphite Reactor (Building 3001), was built to produce fissionable plutonium.; Hillside Drive—N35° 55.68 W84° 19.06. The X-10 Graphite Reactor has been designated a historical landmark by the American Society for Metals (dedicated 1973) and the National Park Service (1966). Also, the American Chemical Society has designated the Oak Ridge National Laboratories as a National Landmark.

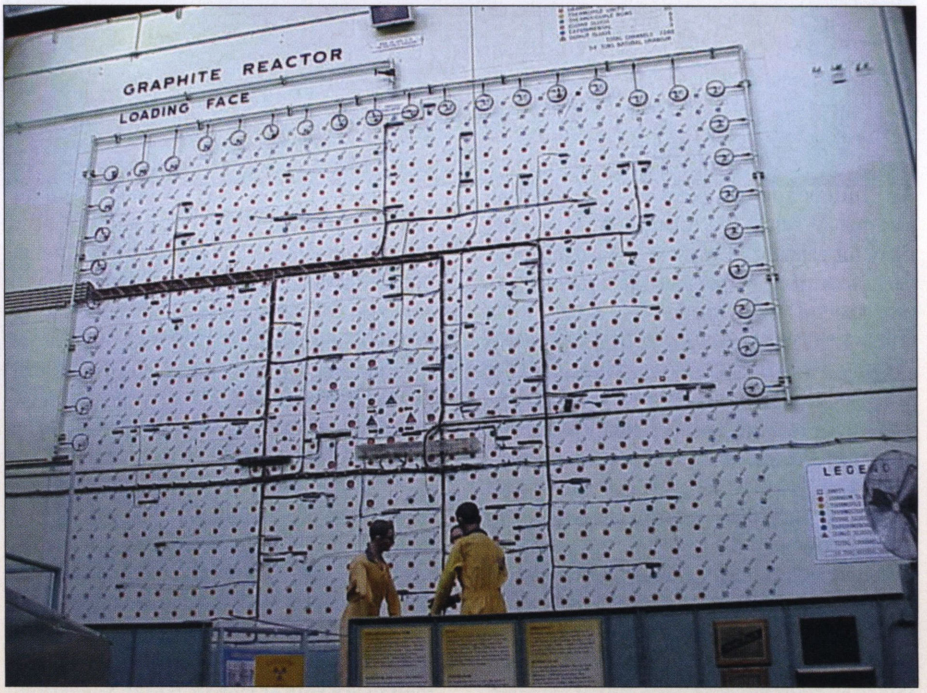


Figure 5. Inside X-10, Graphite Reactor, where promethium was produced in the atomic pile. This is the "loading face" where 54 tons of uranium rods had been inserted, with model mannequins at the bottom. After reaction, the uranium slugs were pushed into a canal of water 20 feet deep, and then were transferred to the Chemical Separations Building.

It soon became clear that all isotopes of promethium were radioactive (the longest-lived isotope is promethium-145 with a half-life of 17.7 years), and claims by earlier researchers to have observed it in nature were

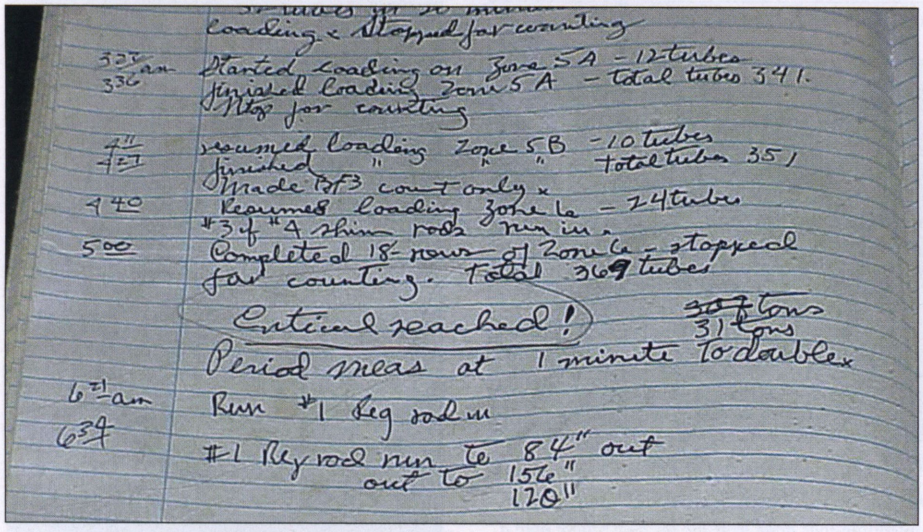


Figure 6. The Graphite Reactor was designed and built in 10 months. Notebook on display: "Critical reached" on November 3, 1943, 5am, at which time the nuclear chain reaction was self-sustaining. The reactor went into production the following day.

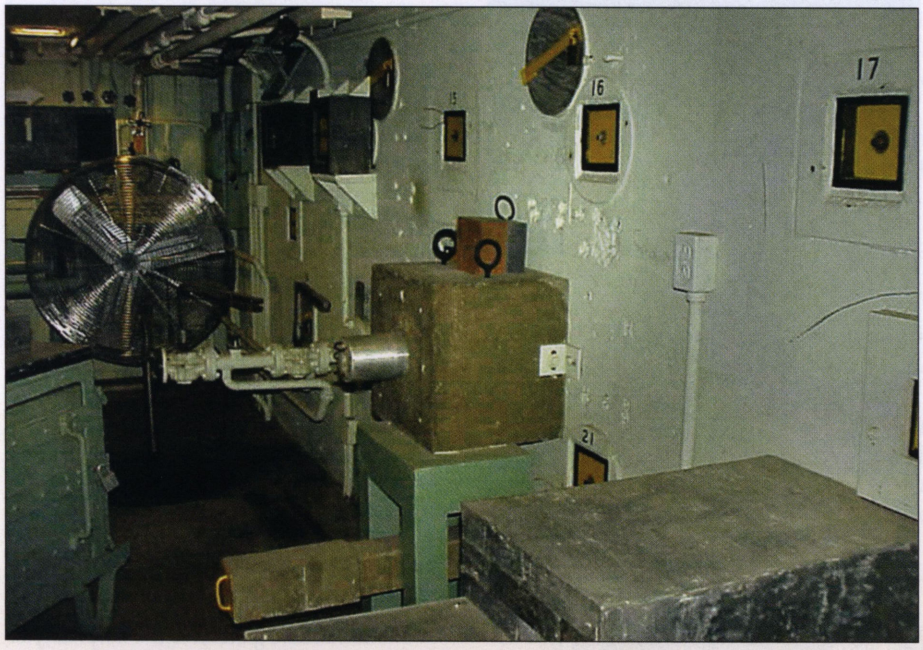


Figure 7. Upper room, where radioisotopes were prepared, after 1945. Radioisotopes were produced by bombarding chemical elements with neutrons from the nuclear chain reactions or fissioning—that occur inside a nuclear reactor. Radioisotopes are used in various applications for medical, industrial, agricultural, military, space, and scientific research. Prepared radioisotopes includle iodine-131, phosphorus-32, and carbon-14. The reactor stopped operation in 1963.

thus shown to be erroneous.[17] The (extremely faint) X-ray lines claimed to belong to a new element by Hopkins and others now were known to have been due to impurities which could never be completely removed in those days before ion exchange chromatography (unfortunately, the original analyzed samples are no longer available,[7] and the exact composition of these is not known).

Owing to security concerns, the announcement[17] of the discovery of promethium was delayed until 1947 (Figure 10). The formal announcement[15] itself was made at the 112th national meeting of the American Chemical Society, New York City, September, 1947.[16] (Ironically, W. A. Noyes was then president of the American Chemical Society, and presided over the General Meeting). Afterwards a press conference was held where Hopkins, Harris, and Yntena attended to make a futile plea for "illinium," as well as Lawrence Larkin Quill (1901–1989) and M. L. Pool (1900–1982) of

Figure 8. Frank Spedding pioneered the method of ion-exchange chromatography for the separation of materials.[14] He was "universally acknowledged as one of the world's foremost experts on the identification and separation of rare earths."[21] He developed methods for producing large quantities of high purity uranium critical to the Manhattan project.[21] Photo courtesy of University of Iowa archives.

Ohio State University, who had performed some inconclusive cyclotron studies (bombarding samarium with deuterium) and were suggesting "cyclonium" for the name of the element 61.[2d] The adopted name of "promethium" was made the following year.[18] The suggested name, promethium, was made by Coryell's wife Grace Mary.[16] "The name refers to Prometheus, the Titan in Greek mythology, who stole fire from heaven for the use of mankind. It not only symbolizes the dramatic way in which the element is produced as a result of harnessing of the energy of nuclear fission, but also warns of the danger of punishment by the vulture of war." In 1949 the name promethium was officially adopted by the IUPAC.[16]

The fate of illinium. After the discovery of promethium, all isotopes of which had short half-lives, it became clear that it was impossible for promethium to have been observed in ordinary rare earth minerals. Rolla himself retracted the claim of his discovery of element 61, as if he wanted Hopkins to own completely the "credit of failure."[2d] Rolla's successor at Florence, Giorgio Piccardi (1895–1972), who was heavily involved in Rolla's rare earth research, when later asked what he thought of all the florentium work, was heard to state philosophically, …"the great Poincaré defined science as the cemetery of hypotheses; if in it our own is buried, I will be honored."[2d]

Promethium in nature. Intense searches have actually shown that promethium has been observed in nature "in trace amounts in uranium ores, as a product of uranium fission."[7] A sample of African pitchblende was found to contain 4×10^{-15} grams of Pm-147 per kilogram of ore.[19] The 147Pm/U ratio in the pitchblende was 3×10^{-4} disintegrations per second per gram of uranium. The observed 147Pm/U ratio in the pitchblende was in agreement with the 147Pm/U equilibrium ratio in non-irradiated natural uranium. The results indicate that the

Figure 9. Chemical Analysis Building, Oak Ridge, TN, where promethium was isolated (originally the west wing of the building complex; then building #706, now building #3550, Central Ave.—N35° 55.61 W84° 18.99). The actual laboratory where the separation of promethium was done is at the far end, where now a modern brick building stands (visible behind the wooden structure).

147Pm in African pitchblende was produced predominantly by U-238 spontaneous fission – just as it was produced at the X-10 Graphite Reactor. Apparently, billions of years ago, when the concentration of U-235 was higher, there *was* such a natural reactor—the Oklo Reactor[17]—a site in Gabon, Africa, ca. 2 billion years ago. Analysis of the product shows an anomalously large concentration of samarium-147 (a beta-decay product of Pm-147), indicating that the concentration of Pm-147 was once higher at this site (but no longer).

The ultimate fate of illinium. Although Rolla had conceded the obvious, Hopkins campaigned the rest of his life for the cause of illinium, never wavering in his claim, even when he saw Marinsky's preparations at a regional American Chemical Society Meeting (Syracuse, New York) in 1948.[2d] The announcement read: "The first exhibition to the public of compounds of elements 43 and 61 took place at the closing session of the symposium held by the Division of Physical and Inorganic Chemistry of the American Chemical Society at Syracuse University, June 28–30. Three milligrams each of the yellow chloride and the rose nitrate of element 61 were shown as well...."[20] Promethium had definitely replaced illinium.

And yet the memory of illinium lives on in St. Petersburg, Russia! On the "Wall Periodic Table" erected in 1936 at the Metrology Institute (where Mendeleev was employed his later years), illinium still stands (Figure 11)—a ghost reminding us of the thousands and thousands of hours of crystallizations necessary to deliver a handful of new elements to the chemist's laboratory shelves. This element—albeit spurious—is the only one on this Mendeleev wall which was "discovered" by a member of ΑΧΣ.

Figure 11. The "Wall" Periodic Table in St. Petersburg, at the Metrology Institute, 19 Moskovsky Pr., St. Petersburg, Russia (N59° 55.08 E30° 19.05), constructed in 1935.[22] Two of the original elements included in this table—illinium and masurium— were eventually discredited. However, illinium ("Jl") remains, while masurium (which was originally assigned for element 43; directly above the "Jl," between "Mo" and "Ru") has been scraped off, probably for political reasons, rising from painful memories of World War I battles in the Masurian region.[1b]

It is a tribute to the professionalism of chemistry that the relationship between Hopkins and James, albeit competitive, was always cordial. In the end, although both achieved great success in their research of rare earths, neither had ever actually understood that they never had in hand any sample containing element 61. The discovery of this element had to await the nuclear age with its new methods and technology. This is a story that reminds us of the philosophical words of Roald Hoffmann that the "voyagers of discovery" should lead us not into "false condescension" of criticism, but instead through the joyful travel "into lovely meandering paths, leading to an understanding of how chemistry really works."[2a]

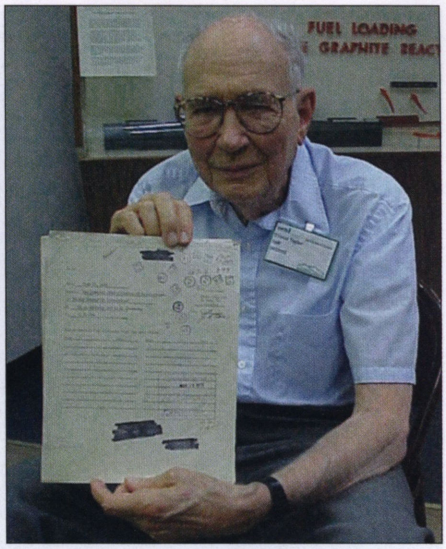


Figure 10. Dr. Ellison Hall Taylor (1913–2008) was interested in preserving the legacy of ORNL (Oak Ridge National Laboratory) since its inception. He was director of the Chemical Division 1954–1974. In this photo taken in 2002, Dr. Ellison holds the original internal memorandum describing the isolation of promethium, dated June 27, 1947, while the actual work itself was performed three years earlier and was kept classified during WWII. The formal publication appeared in the Journal of the American Chemical Society *five months later.[15] In the 1950s Dr. Taylor was part of the team which pioneered molecular beam chemistry at Oak Ridge.*

Acknowledgment.

The authors are grateful to the hospitality of Dr. Steven Snow, head of the American Museum of Science and Energy, who arranged the visitation to all the important sites of Oak Ridge and Marilyn McLaughlin (Oak Ridge National Laboratory Communications and Community Outreach) and furnished a history of Oak Ridge and the Clinton Laboratories. A decade after our visit to Oak Ridge, these people are still active in volunteer work, conducting bus tours. Special recognition is also given to the late Dr. Ellison Taylor (Figure 10) for his insight and important memories.

In addition, discussions with Marco Fontani and Mary Virginia Orna (authors of reference 2) were extremely valuable, furnishing details regarding the history of illinium and florentium (aka promethium).

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Living the Three Objects at *Alpha Omega* *(continued from page 3)*

Nico Villa-Roel creates giant dry ice bubbles at the YMCA event (image by Wen Liu).

of science and technology. At the fair's Exploration Expo, there were more than 100 booths spread around Centennial Olympic Park and more than 17,000 people attended. Our exhibition's name was The Art of Chemistry— we showed how to make paint, which attendees used to create their own masterpieces, and we taught kids about chromatography with coffee filters. We had about a dozen brothers working at a time, and we were packed. It was amazing to see these kids getting excited about chemistry!

The following semester, we coordinated with a local YMCA to host a Science Expo. We packed up a car full of beakers, dry ice, half and half, flour, and even a hairdryer and headed to the Wade-Walker Park YMCA in Stone Mountain, Georgia. We had brothers spread out in four rooms and multiple experiments going between them. Groups of kid walked from room to room, eating from bags of dry ice-formed ice cream they had made in the first one. They got to guess colors in flame tests at one table and then go across the room to play with natural pH indicators. One little boy proudly told his dad that he learned the word Anthocyanin. Down the hall, the elephant toothpaste experiment was drawing the second biggest crowds—after the ice cream, of course.

A Night at the Museum with Research Triangle Professional Chapter

Submitted by: Wendy S. Robinette, *Gamma Iota 1988*, RTP President

The Research Triangle Professional Chapter was invited to the Museum of Life and Science in Durham, North Carolina, once again, to present a chemistry magic show. Our performances were held on Saturday, October 3, 2015. This time we put together a show centered on fluorescence and phosphorescence. The museum has a demonstration theater upstairs, with seating for about 20, and, as before, there was an overflow crowd. With three tube black lights and a smaller LED black spotlight, we performed experiments to find out what glows in the dark from the samples available at the museum in addition to other items

(continued on page 11)

Dan Foreman helps make glow-in-the-dark slime (image by Dave Morgan).

IN MEMORIAM

BANDOVICH, Emil C., *Alpha Psi 1948*
BRUMBAUGH, Robert J., *Alpha Iota 1946*
CLARK, Robert E., *Beta 1948*
CRAWLEY, David M., *Delta 1962*
DINTIMAN, Jr., Luther L., *Alpha Iota 1940*
FEEHAN, Thomas J., *Alpha Tau 1942*
GARLINGTON, William D., *Chi 1944*
JENNINGS, Wilfred S., *Chi 1946*
JONES, Thornton Keith, *Sigma 1947*
KAELBLE, Emmett F., *Zeta 1954*
LEUTWYLER, John C., *Beta Epsilon 1953*
MACARTOR, Frank Leonard, *Alpha Phi 1947*
MILLER, James D., *Alpha Delta 1967*
NICKOL, Donald E., *Nu 1947*
SORROW, MD, John M., *Rho 1942*
SPILNER, Allan J., *Chi 1942*
SWEARINGEN, John D., *Alpha Sigma 1941*
TROUT, James B., *Alpha Iota 1948*
VORRES, Karl S., *Beta Nu 1963*
WENDT, Robert C., *Zeta 1953*
ZECHER, David C., *Alpha 1963*

Emil C. **BANDOVICH**, *Alpha Psi 1948*, 94, passed away November 11, 2015. He was born March 7, 1921, and was a lifelong resident of the Waukegan, Illinois, area. Emil served in the army as a medical assistant. After service he attended Illinois Institute of Technology majoring in engineering. He graduated from Lake Forest College. He worked at Johns Manville for 34 years as an industrial engineer supervisor before retiring in 1984. Emil was principal of High School Religion at St. Joseph's Church and was a member of C.F.U. Lodge #75. Many of his friends will recall Emil playing their requested song on his harmonica: you name it, he could play it. He enjoyed dancing, and Sunday night at the rink is where he met his wife, Bernice, whom he married in 1948. He was a master of rhyming and making puns out of words. Even at 94 years old, he played a very skillful game of cribbage.

Robert Earl **CLARK**, *Beta 1948*, 91, of Hickory, North Carolina, passed away November 12, 2015. Born September 26, 1924, in Hennepin County, Minnesota, Robert was a chemical engineer specializing in the pressure sensitive tape industry. From 1960 until 1973, he worked at what is now Shurtape. He was a charter member of Northminster Presbyterian Church and was a member of the U.S. Army Air Corps during World War II and U.S. Air Force during the Korean War. He is survived by his wife of 66 years, Juanita Peugh Clark, and their four children.

David Maxwell **CRAWLEY**, *Delta 1962*, was born on December 22, 1937, in Kansas City, Missouri. In 1959, Dave married his high school sweetheart, Norma Jean McCartney. After 56 years of marriage, they have four children and 15 grandchildren. After earning his B.S. degree in chemical engineering from the University of Missouri, Dave began a career with Stauffer Chemical Corporation, which led him to jobs of increasing responsibility from Michigan, to West Virginia, to Connecticut, and ultimately to Tennessee, where he built and managed a chemical plant. Following a brief retirement, Dave returned to chemical engineering with Fisher Scientific in New Jersey and (after another retirement) as a private contractor in San Diego. Retiring yet again, Dave and Jean settled in Stanley, North Carolina, where they built their dream house and, with family members, developed the small subdivision of Cowans Ford Park. Dave worked hard and played hard, playing basketball, fly fishing, and coaching his sons' soccer teams. Although two failed knee surgeries limited his physical activity, he was a skilled golfer. Despite suffering from chronic lymphocytic leukemia, Dave played a round of golf almost every week until the last month of his life. An inveterate supporter of his children, employees, friends, or anyone else, he gave of his time, energy, and counsel to further their pursuits. His eagerness to share biblical wisdom continued and in the midst of his "retirements." In 1994, Dave and a friend began the Christian publishing ministry Timeless Texts. Dave continued operating Timeless Texts and companion store, Timeless Christian Books, the rest of his life.

Luther Lloyd "Pete" **DINTIMAN**, *Alpha Iota 1940*, was born November 17, 1920, in Steelton, Pennsylvania, and died on December 4, 2015, in Oakmont, Santa Rosa. He was a devoted husband, father, chemical engineer and executive, wine connoisseur, golfer, community leader and volunteer. He was a longtime member of Kiwanis. Pete received his degree in chemical engineering at University of Pennsylvania in 1942, and immediately went to work at Union Carbide Corp. in various positions in West Virginia, Texas and then in New York where he was vice president—distribution, chemicals and plastics. He was a member of the American Institute of Chemical Engineers and Tau Beta Pi honorary. After retirement, Pete moved to Oakmont in 1988. He served on the board of the Oakmont Valley Association and was a generous contributor to the Sonoma County Orchestra, Somona State College, the Luther Burbank Center and other community organizations.

Thomas Joseph **FEEHAN**, *Alpha Tau 1942*, of Houston, Texas, died November 22, 2015. Br. Feehan was born in New Orleans on February 12, 1924, and received his bachelor's degree in chemical engineering from Tulane in 1944. He was a member of Tau Beta Pi and was elected Outstanding Engineering Alumnus in 1978. Br. Feehan served with the First Marine Division in the Okinawa Campaign in WWII. He joined Brown & Root, Inc. as a junior engineer in 1947 and served that company for 38 years in increasing positions of responsibility, rising to vice president in 1968, president and CEO in 1977, and chairman in 1983. He retired from Brown & Root in 1985. Br. Feehan was a former director of Brown & Root, Halliburton Company, First City Bank Corp and the Foxboro Company. He served as a director and supporter of numerous professional, civic, and philanthropic organizations. He was an avid bird hunter and golfer and was a member of St. John Vianney Catholic Church. He was preceded in death by his wife, Virginia, and is survived by his three daughters.

Wilfred 'Bud' **JENNINGS**, *Chi 1946*, of Warwick, Pennsylvania, passed away December 22, 2015. He was 91. He was the husband for 66 years of Elizabeth 'Betty' Jennings. Bud graduated from Yale with a degree in chemical engineering. He worked his entire career at ARCO, where he was the manager of refinery technology. Bud was a member of the American Petroleum Institute and a United States Marine Corps veteran. His passions in life were his family, opera and classical music. In addition to his wife, he is survived by his four children.

Emmett Frank **KAELBLE**, *Zeta 1954*, age 83, died June 6, 2015. Emmett was a loving husband to wife Martha for 60 years and was father of children Alan, Lynne, Steve, and Tam. He was a friend to many from First Presbyterian Church of Kirkwood, Monsanto, Friendship Force, St. Louis Christmas Carols, and Aberdeen Heights.

John (Jack) Connor **LEUTWYLER**, *Beta Epsilon 1953*, died of natural causes at the age of 82 on October 2, 2015, in Mill Valley, California. Jack was born in Savannah, Georgia, on July 4, 1933. He is survived by his wife Jean, sons Matthew and Michael and stepsons Tatum, Nathan and Bob Holt. Jack received his Bachelor of Science degree in chemical engineering from Clemson in 1955. In 1961, he received a Ph.D. in chemical engineering from Yale. He also studied at the University of Paris-Sorbonne under a Fulbright Grant from 1959–1960. He was employed by Chevron Corp., in multiple capacities, until his retirement in 1996. He was vice president and general manager of operations for Chevron Shipping Company, the marine transportation subsidiary of Chevron. He also served as liaison with his company's interests in Kazakhstan, as well as in positions in strategic planning, traffic and chartering, and corporate logistics and trading. Jack enjoyed a wide range of hobbies. He loved fishing, worldwide travel, skiing, classical music, ballet and opera. He was a devoted dog owner, and often took his dogs in the fields to hunt birds. He was an enthusiastic sports fan, whether cheering on his sons at school athletic events, or rooting for the San Francisco Giants and 49ers. He loved to cook his favorite Southern fried chicken and enjoyed dinner parties in the Larkspur home he shared with his family. His love and support of his family, along with his numerous close friends, was the core of his life.

Donald Eugene **NICKOL**, *Nu 1947*, 90, died November 3, 2015, at his residence. He was the husband of Joan Gloria (Bell) Nickol and is father to a son, and two daughters. He and Joan celebrated their 66th wedding anniversary on June 19. He was born September 5, 1925, in York, and after one semester at Penn State, Don enlisted in the U.S. Army. He was part of the 16th Field Artillery Observation Battalion, participating in the Normandy, Northern France, Rhineland, Ardennes & Central Europe campaigns. He received the Good Conduct Medal, World War II Victory Medal, European Service Medal with five Bronze Stars and the French Jubilee of Liberty Medal. He also served as an officer in the U.S. Air Force Reserves. In retirement, he wrote a book using excerpts from his letters home. He graduated from Penn State in 1949 with a B.S. in agri-

cultural biological chemistry. He began his career with Beacon Milling Company in Cayuga, New York, and transferred to York in 1953. In the 1960s, he started Eastern Laboratory Service Associates, an analytical laboratory testing food, feed, forage and water. He worked with Bob Hoffman and participated in product formulation and testing of his health products. Don also served as an inspector with the York City Health Department. Selling the laboratory in the late 1980s, Don and Joan retired to live along the Bogue Sound in North Carolina. Don was a teacher and a leader. He taught Sunday school and taught chemistry to RN students at York College. He had been a Boy Scout leader, a church deacon and a church elder. He was a past chair of the American Chemical Society. He was an honorary life member of the Susquehanna Yacht Club. Don liked nature, music and travel. He knew birds and their calls. He canoed, sailed, boated, windsurfed and scuba-dived. He played the organ and was always listening to music.

James Barry **TROUT**, *Alpha Iota 1948*, 89, died January 9, 2016, surrounded by his wife and family. Barry was born June 27, 1926, in Upper Darby, Pennslyvania. While serving in the Navy during WWII, he attended Middlebury College and Cornell University. Barry earned a degree in chemical engineering at University of Pennsylvania. He married Ruth Laura Peoples in 1949, a marriage that would last 66 years. After graduation in 1950, he began his professional career working for DuPont, the Electric Storage Battery Co., and the Navy Dept., Bureau of Ships in Washington D.C. He also served as councilman and mayor of Vienna, Virginia. In 1965, Barry moved his family from the East Coast to Texas to work for NASA. Over the next few decades, Barry served in the Gemini, Apollo, Skylab, Apollo-Soyuz, Shuttle-Mir, and Space Shuttle programs. He retired in 1991. He was actively involved in the Episcopal Church, and served as a lay minister at St. Nicholas Charismatic Center, leading Life in the Spirit seminars. He was an avid reader, enjoyed music and singing, playing various instruments, and loved fishing and the ocean. He was a man of great intelligence, integrity, wit and compassion. Barry had six children.

Karl Spyros **VORRES**, *Beta Nu 1963*, was born in Chicago, March 14, 1927, and died August 7, 2015, in Tucson. He graduated from Michigan State with a B.S. and M.S. degree, and the University of Iowa with a Ph.D. in chemistry. He is survived by his wife, Nancy, and four children.

David C. **ZECHER**, *Alpha 1963*, passed away September 15, 2015. He was born and raised in Lancaster, Pennsylvania, and attended Franklin & Marshal College. He attained a Ph.D. from the University of Wisconsin and worked for Hercules for 31 years as a research chemist. Dave was active in Limestone Presbyterian Church, Brandywine Valley Stamp Club, and Stuyvesant Hills Civic Association. He was an avid golfer with memberships at Hercules and then Newark Country Club. He enjoyed hiking, biking, vacations, and family gatherings. He is survived by his wife, Karen, and a son and daughter.

A Night at the Museum with Research Triangle *(continued from page 9)*

we brought along. The LED spotlight was particularly useful for shining on individual samples in these experiments. We talked about fluorescence of natural and synthetic materials—Mother Nature's and man-made," as we put it. We showed the audience how to make "ink" for secret writing—using All brand detergent diluted 3:1 with water—and compared dollar bills that had been through the washer with unwashed dollar bills, the washed ones fluorescing much more brightly than the unwashed. And, to bring down the curtain, we made glow-in-the-dark slime.

Wyvern Achievement: Ashley Cantrall, *Beta Psi 2013*

The Southern Illinois University Great Cardboard Boat Regatta is by far my favorite event of the year that the *Beta Psi* Chapter is involved in and coordinates.

The Regatta at SIU is a community-wide event that draws a crowd from several surrounding towns in southern Illinois. The event in itself is a form of science outreach in which the *Beta Psi* Chapter encourages community members to build a boat using corrugated cardboard in which individuals involved can row through a course on our very own campus lake—and (in theory) stay afloat!

Ashley Cantrall, Beta Psi 2013, *makes chemistry happen at the Regatta booth.*

It is a very fun event to witness! At this event, *Beta Psi* brothers also put up a tent for science outreach demonstrations for entertainment while children wait for heats of the boat races to proceed. These demonstrations typically are comprised of water-related topics and properties.

The event, racing cardboard boats, itself promotes Archimedes' principle; while our demonstrations typically demonstrate properties of water such as density, capillary effect, and surface tension, to name a few.

I had the additional opportunity this year to lead the behind-the-scenes activity of the event and fortunately it ran very smoothly! My favorite part is simply watching the community get involved and excited to compete in the event, all with varying levels of preparation for their vessel. Some participants meticulously work out the computations involving their floatation device, while others show up the day of and assemble their boat onsite. It is a great joy to simply be a part of involving the community in this long-standing tradition at Southern Illinois University!

Jonathan E. WENZEL, GPA, *Delta 1996*, married Jennifer Davis on October 3, 2015. Alpha Chi Sigma brothers comprised most of his side of the wedding party, including David Lloyd (*Delta*), Jason Ellis (*Delta*), and GMC Kip Nalley (*Alpha Sigma*). Several *Delta* Chapter alumni who met as collegiates and subsequently got married and started families pose for a picture. From left: Anne Ellis (*Delta*), Ian Ellis, Katherine Ellis, Jason Ellis (*Delta*), David Lloyd (*Delta*) who met his wife Leonie Lloyd, *Gamma Mu*, at the last Atlanta conclave, Jon, Jennifer, Quincy Tomko, Eric Tomko (*Delta*), and Kim Tomko (*Delta*).

NEW INITIATES

ALPHA
Somer R. Beaudoin
Ethan M. Coloma
Sarah M. Hall-MacKenzie
Sanjana R. Janagam
Monica J. Kapp
Sage C. Keyes
Katy E. Klein
Alexandra M. Korndorf
Brian C. Leung
Josua I. Mendoza
Emma J. Meyer
Caitlin M. Pavelec
Christine R. Samuelsen
Ryan J. Wirtanen
Annie Yao

BETA
Derek A. Clement
Morgan E. Hughes
Amelia C. Kirkhorn
Giang T. Le
Merrick D. Pierson Smela
Emily A. Purdham
Paul W. Shafer
Brianna E. Stewart
Yuqi Zhou

GAMMA
Prashansa Agrawal
Sarah X. Deng
Fangze Liu
Daniel Mezin
Devlin C. Moyer
Shiyi Qin
Adam J. Steel
Jenna C. Sullivan
Sydney Vereb

DELTA
Astrid R. Appert Lund
Sarah Burkart
Joanna A. Chmiel
Isaac Coronel
Leslie Day
Madison K. Eifert
Thomas Ertl
Michaela M. Lenz
Kyle D. Oberkrom
Jeremy A. Quinton
Derrick J. Rens
Megan N. Saracino
Rylie N. White
Kimberly T. Wilhite
Dakota P. Wilson
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EPSILON
Venu G. Bangla
Marielle L. Cabe
Chirag D. Divecha
William D. Embrey
Samuel R. Ford
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Jordan Hoang
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Jingyu Li
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Fiona Q. Qu
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Patrick J. McGowan
Jason C. Meyer
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Thanh K. Nguyen
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Tejea A. Swanston
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Getting Ready for the 53rd Biennial Conclave (July 25–30, 2016) at Georgia Tech!

Submitted by Matthew Cline, *Alpha Omega 2012*, and Chuck Winslow, *Alpha Omega 2013*

On July 20, *Alpha Omega* celebrated a big day: our colony, *Beta Iota*, had just been voted to be reinstalled and our bid for the next biennial conclave was chosen! The 53rd Biennial Conclave will be held July 25–30, 2016, at the Georgia Institute of Technology in Atlanta.

Our Three-Star chapter has really grown in the past few years—in 2015 we welcomed 40 new brothers into our chapter. With these new members, we have had outreach events like experiments for local schools and YMCAs, helping local Boy Scouts earn their chemistry merit badges, and having a booth at the Atlanta Science Festival. We held tailgates (during winning and losing seasons), a mountain weekend retreat, and weekly study parties as well as weekly brother lunches and dinners. At our district's most recent conclave, we took home the Best Chapter award for the fourth year in a row.

We are so excited for everyone to visit us next summer at Georgia Tech. *Alpha Omega* was founded in 1932, and after reactivating in 1979, we have been going strong. We currently have around 60 active members from more than 15 states and 7 countries. Tech is located in the heart of Atlanta, Georgia—home of the world's busiest airport, the largest aquarium in the Western Hemisphere, and in our opinion, the greatest university. This conclave will be held in Tech's North Avenue Apartments—the former Olympic Village from the 1996 Olympics. This complex has a dining hall and meeting rooms all in one area, and is right down the road from Atlanta icons like the World of Coca Cola, the Georgia Aquarium, and a Tech tradition: The Varsity. We would like to invite all brothers to join us in Atlanta for an amazing experience with brothers from across the country. We can't wait to open up our chapter to everyone this summer and celebrate our biggest year yet!

ALPHA CHI SIGMA
53rd Biennial Conclave
GEORGIA INSTITUTE OF TECHNOLOGY

Official Conclave logo designed by Alpha Omega *Brother Nico Villa-Roel*

LOOKING BACK

D. Mitch Levings, OA, Grand Historian
Beta Delta 1975

100 years ago…Spring 1916

The Fraternity broke into double letters with the installation of *Alpha Alpha* Chapter. On March 2, the Stanford University Chemical Association, led by senior chemistry student Paul D. V. Manning, submitted 40 copies of their petition to the Grand Chapter. The petition, signed by seven members of the faculty, four graduates, nine seniors, four juniors and five sophomores, was quickly approved and a May 5 installation was scheduled. The installation ceremony was conducted in Pomona Hall, Palo Alto, where the installing officer, GMA Harry Curtis, was assisted by about 20 members of *Sigma* Chapter and the Golden Gate Alumni Chapter.

Close on the heels of the *Alpha Alpha* installation came the installation of *Alpha Beta* Chapter at the University of Michigan. The push to install an Alpha Chi Sigma chapter at Michigan began in 1908 when J. H. Mathews reached out to Chemistry Professor William J. Hale about converting a local chemistry club called The Alchemists into a chapter of Alpha Chi Sigma. Matthews and Hale worked toward that goal until March 1913. Mathews had traveled to Michigan to give a lecture on color photography, and while on campus, he met with many members of the local group. Matthews came to the disappointing conclusion that Alpha Chi Sigma and The Alchemists would not make a good fit. Despite the Supreme Council's abandonment of expansion at Michigan, a group of four Alpha Chi Sigma men at Michigan, namely: W. L. Badger, *Beta;* C. C. Meloche, *Alpha;* A. H. Huisken, *Zeta,* and E. B. Peck, *Pi,* picked up the challenge. On March 8, 1916, Huisken wrote GMA Curtis, saying that they had organized a group apart from The Alchemists and they were drawing up a petition to affiliate with Alpha Chi Sigma. The petition was received, approved and a May 27 installation was scheduled. Representing the Supreme Council at the installation was G.R. T. Shaw, and V.G.M.A. Nickell. It should be noted that at its installation, the *Alpha Beta* Chapter was made up almost entirely of faculty and graduate students.

The Spring Meeting of the American Chemical Society was held in Urbana, Illinois, giving the Fraternity a high degree of visibility. More than 100 chrome yellow nametags (with deep blue lettering) were given out at registration to the members of Alpha Chi Sigma. Nearly every brother attending this meeting also attended a smoker at the *Zeta* Chapter house.

Meanwhile on the Urbana campus, a chemical sorority called Alpha Theta Chi was established. The *Zeta* Chapter of Alpha Chi Sigma wished the new sorority much success. They further hoped that Alpha Theta Chi would mean as much to the women in chemistry as Alpha Chi Sigma means to the men.

Because of the failure of a few chapters to complete pledging and initiation records in a timely fashion, the National Office set a policy of not issuing badges until all the paperwork and appropriate fees had been filed.

75 years ago…Spring 1941

The five Professional Counselor positions, authorized by the fifteenth Biennial Conclave, were filled by the following brothers: Merle L. Griffin (*Alpha Epsilon*), Counselor-at-Large; Earl F. Moorman (*Epsilon*), Northern Region; M. J. Seavy (*Nu*), Eastern Region; L. Reed Brantley (*Beta Gamma*), Western Region; and W. B. Connell (*Delta*), Southern Region. The creation of the Professional Counselor position took responsibility for the 25 active Professional Chapters and Groups. This left the 11 District Counselors to deal only with the 46 collegiate chapters.

Kappa Chapter (Kansas) and *Beta Delta* (Missouri-Rolla) held a joint initiation at the *Kappa* Chapter house. While only five from *Kappa* and four from *Beta Delta* were initiated, the event was also attended by representatives of *Delta* (Missouri-Columbia), *Nu* (Penn State), *Alpha Phi* (Tennessee), Kansas City Professional and St. Louis Professional Chapters. Other inter-chapter activities include the bowling duel between *Zeta* (Illinois) and *Alpha Beta* (Michigan). That contest was tied at one-all in the spring, with doubts of a third match being held due to *Zeta*'s preoccupation with skating, exams, and women (That was the order in which they were reported in the March *HEXAGON* —GH).

50 years ago…Spring 1966

Aldne Emery (*Zeta*) was honored during the Alpha Chi Sigma Banquet at the American Chemical Society's National Meeting in Pittsburgh. Brother Emery had been the executive director of the ACS for 18 years.

The Fraternity was heavily involved with the upcoming 28th Biennial Conclave, hosted by *Alpha Beta* Chapter (Michigan). The published cost for brothers to attend the June observance was $56.50. Proposed issues for the conclave to take on included constitutional changes regarding the blackball system and an improved method for collecting Grand Chapter dues.

The number of active collegiate chapters stood at 46. The average chapter membership was 29. *Alpha* (Wisconsin) was the largest chapter with 67 actives. *Alpha Theta* (Iowa) came in second with 57. The Grand Chapter also listed 31 Professional Chapters and Groups, although not all 31 were active.

The topic of the San Francisco Professional Chapter's March meeting was the escalating problem of commuting traffic. Guest speaker Ray Ceder presented a report on the progress of the Bay Area Rapid Transit (BART) System.

25 years ago…Spring 1941

The Supreme Council gathered on the campus of James Madison University in Harrisonburg, Virginia, for the installation of *Gamma Kappa* Chapter. Before becoming *Gamma Kappa* Chapter, the group was a local chemistry fraternity called Kappa Sigma Mu. During the spring of 1990, Kappa Sigma Mu became aware of Alpha Chi Sigma. Kappa Sigma Mu reached out to Alpha Chi Sigma, resulting in a visit from DC Mark Evaniak on February 19, 1991. Moving quickly, a petition was prepared, approved by the Supreme Council, and accepted by the Grand Chapter all in time for an April 21 installation.

Thirty-two members attended the Alpha Chi Sigma Luncheon during the 201st meeting of the American Chemical Society in Atlanta.

On May 10, Dr. J. H. Jonte was honored at a special ceremony in Rapid City, South Dakota, to honor his 50 years of service to Alpha Chi Sigma. GCA Mike Zachmeier presented Dr. Jonte with a plaque from the Grand Chapter, and *Beta Phi* (South Dakota School of Mines) MA, Stephan Jerde, presented him with a plaque from *Beta Phi* Chapter.

10 years ago…Winter 2006

May 8 became the official charter date for two new chapters. The Kent State Colony of *Gamma* Chapter became *Gamma Sigma* Chapter and the Indiana University of Pennsylvania Colony of *Nu* Chapter became *Gamma Tau*. The charters were presented during a banquet and celebration at some future date, but as of May 8 the chapters were an official part of the Grand Chapter and eligible to send voting delegates to the upcoming conclave.

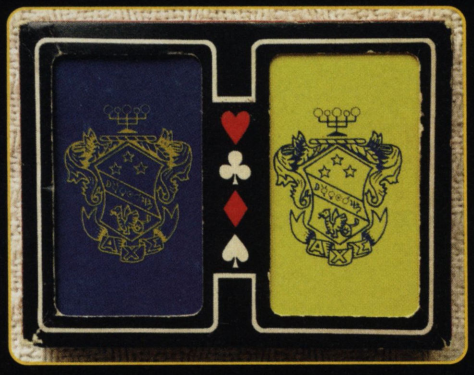
The Supreme Council awarded Dr. Bob Desiderato a certificate of appreciation for dedicated service to the Fraternity and to *Beta Eta* Chapter. Brother Desiderato served as Chapter Advisor to the University of North Texas chapter for 31 years.

Amanda Ferguson, *Alpha Sigma*, was appointed South Central District Counselor for the remainder of the biennium. The position had been previously held by fellow University of Arkansas Brother, Kip Nalley.

The Supreme Council, acting on the recommendations of the Hall of Fame Award Committee, inducted Dr. Charles L. Parsons, *Mu 1911,* and Dr. Irving Shain, *Alpha 1953,* to the Hall of Fame.

Every Year is a Souvenir

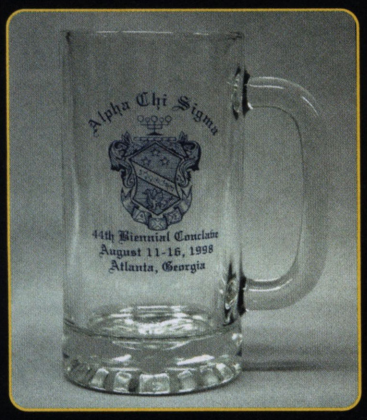
(Part 1: 1986–1998)



1978, hosted by Beta Eta in Denton, TX.

HONORABLE MENTION

1980, hosted by Tau in Ithaca, NY.

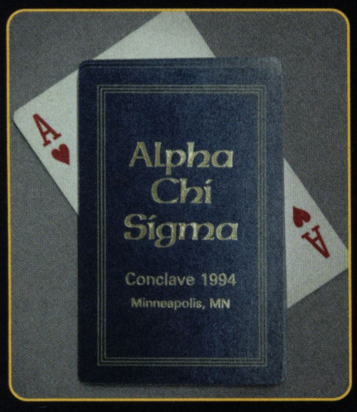


1998, hosted by Alpha Omega in Atlanta, GA.

1996, hosted by Alpha Sigma in Fayetteville, AR.

1986, hosted by Rho in Chapel Hill, NC.

With the upcoming Conclave at Georgia Tech, Brother John Becker, *Iota 1986*, suggested it might be a good time to revisit some of the souvenirs from past conclaves. Thanks to Brother Becker for the great idea and for providing the images from 1986–1998, and GH Mitch Levings for the 1978 and 1980 entries.



1994, hosted by Beta in Minneapolis, MN.

1992, hosted by Epsilon, Iota, & Indianapolis Pro in Indianapolis, IN.

1990, hosted by Gamma Beta in Tallahassee, FL.

1988, hosted by Sigma in Berkeley, CA.

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ZETA-University of Illinois Urbana, IL
IOTA-Rose-Hulman Institute of Technology Terre Haute, IN
MU-University of New Hampshire Durham, NH
PI-Syracuse University Syracuse, NY
RHO-University of North Carolina Chapel Hill, NC
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ALPHA EPSILON-Washington University Saint Louis, MO
ALPHA THETA*-University of Iowa Iowa City, IA
ALPHA KAPPA*-University of Virginia Charlottesville, VA
ALPHA PI-George Washington University Washington, DC
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ALPHA UPSILON-Michigan State Univ. East Lansing, MI
ALPHA OMEGA-Georgia Institute of Tech Atlanta, GA
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BETA IOTA-University of Florida Gainesville, FL
BETA ETA-University of North Texas Denton, TX
BETA MU-Occidental College Los Angeles, CA
BETA NU*-Purdue University West Lafayette, IN
BETA PI-University of the Pacific Stockton, CA
BETA RHO-Kansas State University Manhattan, KS
BETA SIGMA-Rochester Institute of Tech. Rochester, NY
BETA TAU-University of Arizona Tucson, AZ
BETA PHI-South Dakota School of Mines & Tech Rapid City, SD
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