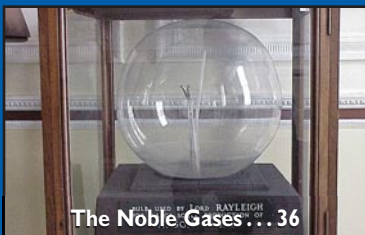
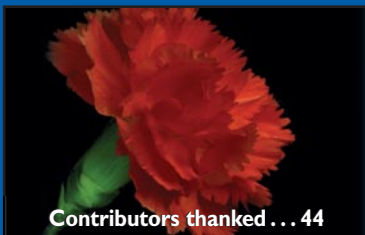




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THE HEXAGON

FALL 2012

of Alpha Chi Sigma



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SUBMISSION DEADLINES

Spring (March)	January 1
Summer (June)	April 1
Fall (September)	July 1
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

It's time to grow

Alpha Chi Sigma is great. We do great things. We have great people. Now it is time for everyone to know about us, and have everyone want to join us... well everyone having something to do with Chemistry, that is. This biennium I would like to focus on growing. We have several expansion opportunities in the works for collegiate chapters at the four pre-colonies at which we have already had members initiated. In the next year, they should all become colonies and soon convert to chapter status. We have Boston University of *Mu*, Stanford University (reactivation of *Alpha Alpha*) of *Sigma*, Georgia Southern University of *Alpha Omega*, and Southeastern Missouri State University of *Beta Psi*.

We need to reach out to more campuses and get more interest in our brotherhood. I would like to charge all brothers who live near a school, or who are in a graduate program at a place that has no chapter, to think about starting a chapter there. Contact us at the office and we will help you. Remember how much fun you had as an undergraduate? Well you can do it again without the exams, early classes, and snoring roommates.

We also need to grow the number of professional chapters. No university or college required—a desire to uphold the three objects and meet and hang out with brothers. Some of our current professional chapters judge science fairs, do chemistry magic shows, participate in our chemistry of color tie-dye program, and so much more. If interested, contact the office and we will help you help us grow. It is easy, fun, and very rewarding.

Finally, we need everyone's help. As we form new chapters, grow our outreach programs, sponsor awards for greatness, and provide more services to our brothers, we need to grow our resources. We need your support through donations. Think about a small or large donation and how much it can do for a freshman college student, a 2nd grader attending a magic show, or a brother in need receiving a loan from our education foundation. If we pool our resources we can plant the seed—or in chemistry terms throw in that seed crystal—and continue to grow into even more greatness.

I hope to look back some short time from now and say, "Wow, look at all that growth, involvement and excitement." Be part of it. Contact us, join our group on Facebook, help support us, or even just stalk our website and be amazed at what we do.



Photo by Aurora Imaging Company

Randy D. Weinstein
GMA (2012–14)
Alpha Kappa 1990

"We need everyone's help."

On the Cover

The annular eclipse of May 20, 2012, photographed by the Old County Cemetery, Brownfield, TX (N33° 11.29 W102° 17.48), 8 minutes before sunset when the waning and reddening sun could be viewed without a dark filter. This location was perfect for seeing how the "ring of fire" actually appears to the human eye. *Photo by Jenny Marshall.*

Dear Brothers:

The distribution of the Fall Issue of *The HEXAGON* goes to all of the membership for whom we have mailing information (ca. 32,000 of you), while the other three issues are provided to collegiate members and contributors. I mention this for two reasons. First, you might actually be unaware that there are three other issues of *The HEXAGON* published, and second, this will motivate you to think about your solicitation letter when you receive it! Yours in the Double Bond – GE

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.

ALPHA CHI SIGMA FRATERNITY

Risk Management Policy

Adopted by the Supreme Council on June 13, 2010.

Its Three Objects guide Alpha Chi Sigma, the Professional Chemistry Fraternity. The National Fraternity, as a resource and support organization, provides the following Risk Management Policy to govern its own events and to guide its chapters as they conduct local events. The responsibility for implementing this policy at local chapter events remains with the local chapters. In addition, members are responsible for their and their guests' compliance with this policy.

ALCOHOL AND DRUGS

1. The possession, use and/or consumption of ALCOHOLIC BEVERAGES, while on Chapter premises, or during an official Fraternity event, or in any situation sponsored or endorsed by the chapter, must be in compliance with any and all applicable laws and regulations, whether they be those of the state, province, county, city or educational institution.
2. No alcoholic beverages shall be purchased through the Fraternity or Chapter treasury, nor shall purchase of such beverages for members or guests be undertaken or coordinated by any member in the name of or on behalf of the Fraternity or Chapter. The purchase and/or use of a bulk quantity of alcoholic beverages, e.g., kegs, is against Fraternity policy.
3. The Fraternity's name shall not be associated with any event co sponsored with an alcohol distributor, charitable organization or tavern/bar where alcohol is given away, sold or otherwise provided to those present.
4. No alcohol shall be present at any rushing, pledging, or initiation event or at any pledge or chapter meeting.
5. It is against Fraternity policy to sponsor events at which non-members of the Fraternity, unless specifically invited, have unrestricted access to alcohol.
6. No member shall permit, tolerate, encourage or participate in "drinking games" while on Chapter premises during a Fraternity event, or at any event sponsored or endorsed by a chapter.
7. The possession, sale and/or use of any ILLEGAL DRUGS or CONTROLLED SUBSTANCES at any Chapter house, at any Fraternity sponsored event, or at any event that an observer would associate with the Fraternity, is strictly against Fraternity policy.
8. Any function where alcoholic beverages are present shall also have non alcoholic beverages and food available.

9. Events at which alcohol is available shall have a guest list, with all attendees registered and with age verification at the door. Any alcohol present is the responsibility of the individual who provides it. A safe ride home program should be provided.
10. It is recommended that events where alcoholic beverages are present be conducted at establishments licensed for the sale and service of such beverages.
11. This policy shall be an integral part of membership training materials. It should also be posted at the door of all parties. Each guest should sign in when they arrive indicating that they have read, understood, and agreed to follow these regulations.
12. Any violation of this policy may be the subject of discipline by a local chapter or by the National Fraternity if it is aware of the violation. If Alpha Chi Sigma receives information alleging a violation of the Risk Management Policy by a chapter, it will conduct an investigation appropriate to the circumstances and take any necessary action. The investigation will give the chapter an opportunity to respond to the allegations.

HAZING

The Fraternity does not tolerate or condone any manner of hazing. Hazing activities are defined as: "Any action taken or situation created intentionally, whether on or off Fraternity premises, to produce mental or physical discomfort, embarrassment, harassment or ridicule." Such activities include, but are not limited to: the use of alcohol; paddling in any form; creation of excessive fatigue; physical or psychological shocks; and any other activities inconsistent with Fraternity Law, ritual or policy, or with the applicable laws and regulations of the state, province, county, city, or educational institution.

SEXUAL ABUSE

The Fraternity does not tolerate or condone any form of sexually abusive behavior, whether physical, mental, or emotional, on the part of its members. This includes any actions that are demeaning to any person or group, including but not limited to date rape, gang rape, or verbal harassment.

Rediscovery of the Elements

The Noble Gases—Rayleigh and Ramsay



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

Henry Cavendish (1731–1810), the discoverer of hydrogen (phlogiston) in 1766, studied atmospheric gases for many years. In 1785, he wondered “. . . whether there are not in reality many different substances confounded together by us under the name of phlogisticated air [nitrogen].”¹ By means of electrical sparking he reacted phlogisticated air with dephlogisticated air (oxygen) to form nitrous air (nitrogen oxides) and “continued to spark till no further diminution took place. . . only a small bubble of air remained unabsorbed, which certainly was not more than 1/120 of the bulk of the phlogisticated air.”¹

Lord Rayleigh.² John William Strutt, 3rd Baron Rayleigh (1842–1919) (Figure 1) was the second Cavendish Professor of Physics (1879–1884) at the University of Cambridge (following James Clerk Maxwell, 1831–1879). Rayleigh is well known for his publications on *Rayleigh scattering* (explaining the blue color of the sky) and *Rayleigh waves* (e.g., surface earthquake waves). He received the Nobel Prize in Physics in 1904 for “his investigations of the densities of the most important gases and for his discovery of argon.”



Figure 2. This is Terling Place, which was built 1770–1771, the home of the Rayleigh family. John Strutt (1727–1816), and his family moved into the house in 1773. His grandson was Lord Rayleigh, John William Strutt, 3rd Baron (1842–1919); when he retired from Cambridge University (1884), he returned to continue research in his private laboratory, the building to the right, where he discovered argon.

The discovery of argon was prompted by an attempt to corroborate the postulate of William Prout (1785–1850), who had proposed³ that the atomic weights of the elements were multiples of the primary substance hydrogen. Rayleigh accurately weighed samples of purified hydrogen, oxygen, and nitrogen to determine if in fact hydrogen was a common denominator (Figures 2,3). He obtained reproducible values for hydrogen and oxygen, but with nitrogen he noticed a discrepancy: atmospheric nitrogen gas weighed more than artificially produced gas. He sent a letter to *Nature*⁴ where he queried: “I am much puzzled by some recent results as to the density of nitrogen, and shall be obliged if any of your chemical readers can offer suggestions as to the cause. . . .” Rayleigh’s data showed, for a 1800-cc flask, 2.3102 ± 0.0002 grams for atmospheric nitrogen



Figure 1. John William Strutt, Third Baron Rayleigh, painted by Sir George Reid, 1903. The original hangs in the Royal Society, London, Carlton House Terrace, London (N51° 30.36 W00° 07.95); a copy resides in the Rayleigh residence in Terling. He was President of the Royal Society 1905–1908.

and 2.2990 ± 0.0006 grams for nitrogen synthesized from ammonium nitrite and other inorganic precursors. Several persons responded, including James Dewar (1842–1923), inventor of the eponymous flask; William Crookes (1832–1919), discoverer of thallium^{5g}; and William Ramsay (*vide infra*). Crookes was the

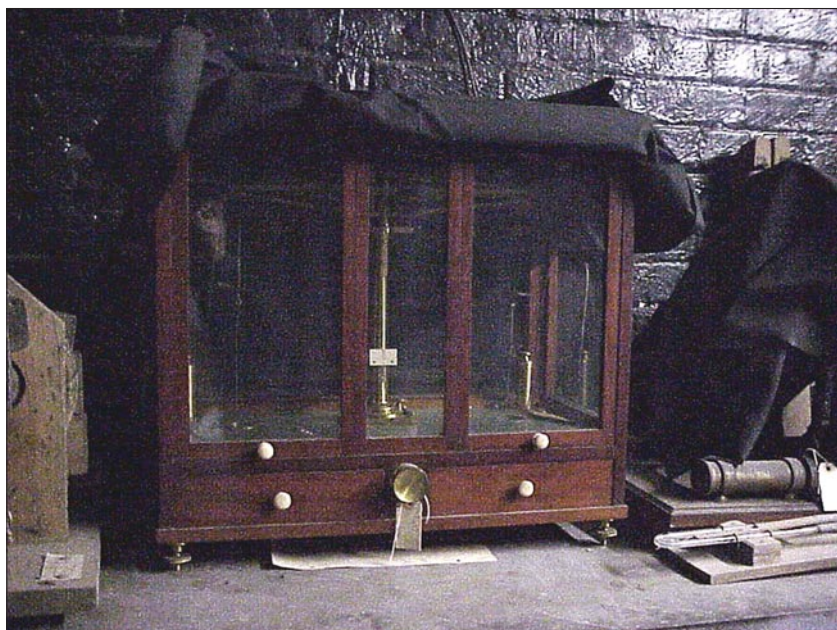


Figure 3. The critical experiment of Rayleigh was on this balance on a marble slab in the weighing room in the basement of his laboratory complex at Terling, where he noted the discrepancy between “physical” nitrogen (from the atmosphere) and “chemical” nitrogen (synthesized from inorganic compounds).

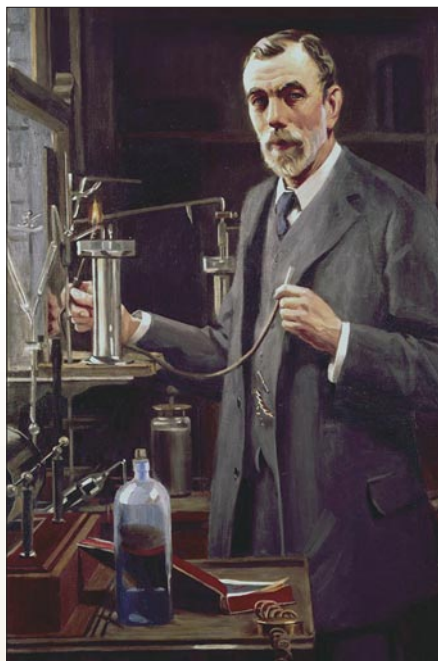


Figure 4. Portrait of Sir William Ramsay, painted by Mark Milbanke in 1913. This hangs in the Ramsay Lecture Theatre Hall of the Chemistry Building (Christopher Ingold Laboratories), University College, London, 20 Gordon Street, London (N51° 31.52 W00° 07.95). Ramsay was perfectly fluent in German and French and could lecture expertly in these languages to scientific audiences who were spellbound by his eloquence.

only one with a specific suggestion, which recalled Cavendish’s earlier research: add oxygen to the nitrogen and spark, remove the



Figure 5. This is Slade Hall of University College, London, now the art building but previously the Science Building where Ramsay performed his research (Gower Court, N51° 31.50 W00° 08.03), 100 meters southwest of the Ingold Laboratories.

resulting nitrogen oxides with caustic potash (KOH), measure the density; repeat until the density does not change.²

William Ramsay.⁶ Sir William Ramsay (1852–1916) (Figure 4), the co-discoverer of argon, won the 1904 Nobel Prize in Chemistry simultaneously with Rayleigh for “the discovery of the inert [noble] gaseous elements in air, and his determination of their place in the periodic system.” Ramsay became professor at

University College, London, in 1887 (Figure 5), replacing Alexander Williamson (1824–1904, who had proved the divalency of oxygen in 1850.^{5b}). Upon reading Rayleigh’s publication in *Nature*, Ramsay asked him if he could carry out his own investigative studies on the problem. Both agreed that the discrepancy was probably due to a heavier impurity in the atmospheric nitrogen, because all known lighter gases, such as hydrogen, methane, ethylene, etc., had been diligently removed (helium was not yet discov-



Figure 6. Rayleigh used this globe (1-foot diameter) to collect argon by sparking atmospheric nitrogen; it is on exhibit at the Royal Institution in London (21 Albemarle Street; N51° 30.58 W00° 08.58).

ered^{5b}). The two decided on different tacks: Rayleigh would remove nitrogen from air by sparking in the earlier fashion of Cavendish (Figure 6); Ramsay would remove nitrogen from air by reaction with hot magnesium (Figure 7).

The collaboration. Never was there a more improbable partnership: the impatient Ramsay and the ultra-cautious Rayleigh. It was “not in the character of Rayleigh to do things in a hurry,”² while Ramsay would “make hasty conclusions with a minimum of data.”² Friends of Rayleigh resented Ramsay’s aggressive style; Lady Rayleigh in her private notes relates how Lord Kelvin was “furious at Ramsay’s interference” in the “greatest discovery of the century [argon].”² It is true that Rayleigh and Ramsay could be irritated with each other; however, each respected the other and they understood that the collaborative approaches of a physicist and a chemist could be beneficial. Rayleigh was impressed with Ramsay as an experimenter and his prompt energetic attack on a problem,² while Ramsay revered his elder, even declaring that “Rayleigh was the greatest man alive.”^{2,7}

On August 4, 1894 Ramsay wrote Rayleigh:^{2,7} “I have isolated the gas at last . . . and it is not absorbed by magnesium.” He determined the density of the gas “X” to be 20.01 (on a scale where oxygen = 16). Rayleigh replied two days later, “I believe I too have isolated the gas, though in miserably small quantities.”² They both recognized^{2,7} that their research was founded on physicist Rayleigh’s original work, but that chemist Ramsay had



showed that “X” was chemically unreactive and suggested that it belonged to a new family in the Periodic Table.⁷

At the 64th Meeting of the British Association [for the Advancement of Science] at Oxford on August 13, 1894 the two scientists presented a preliminary announcement of the existence of a new gas in the atmosphere.⁸ The Chairman, Henry George Madan (1838–1901), suggested the name “argon,” from Greek *argos* (“idle,” “indolent”) from its chemical inertness⁷ (Note 1). Considerable doubt existed regarding the nature of this new gas—it was simply difficult for people to believe that under their noses existed a previously unknown substance making up a substantial portion of the atmosphere. The very notion of an element that did not react chemically was antithetical to the views of some—James Dewar believed it was simply a form of nitrogen, perhaps N₃.⁹

The next year a complete story could be presented. On January 18, 1895, a special meeting

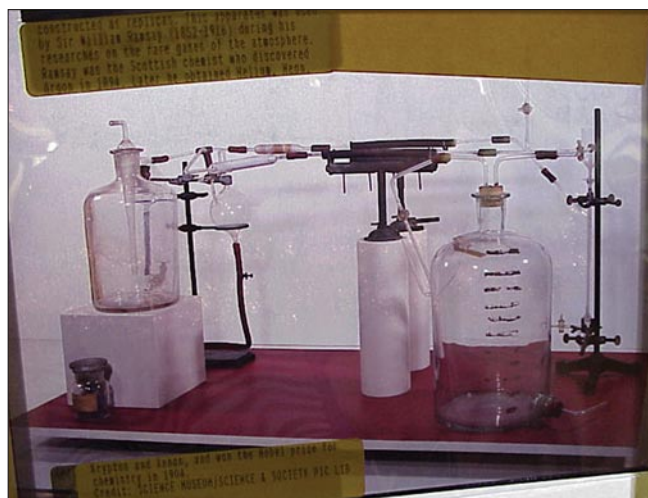


Figure 7. This is a model of apparatus used by Ramsay and Travers, located in the Science Museum, Exhibition Road, South Kensington, London. There were many variations of apparatus, most including ballast air tanks; manometers; pumps; tubes to remove all chemically reactive gases—copper to remove oxygen, copper oxide for hydrogen, soda-lime for carbon dioxide, phosphorous pentoxide for water, and finally magnesium to remove nitrogen. The tubes containing copper, copper oxide, and magnesium were heated by Bunsen burners. Exhibits such as this were once on public display, but are now in storage to make way for more “modern, meaningful” exhibits.

Figure 8. William Ramsay, the colleague of Ramsay who was the co-discoverer of neon, krypton, and xenon.

of the Royal Society was held¹⁰ at its Burlington House on Picadilly (today the home of the Royal Society of Chemistry) with an audience of 800. A complete review of the research by Rayleigh and Ramsay was given, including a determination of the ratio C_p/C_v (heat capacities at constant pressure and volume) of 1.67 which indicated a monatomic gas.^{10a} Then a report by Karol Stanislaw Olszewski (1846–1915) of Krakow, Poland⁷ was presented (by Ramsay) of the cold temperature behavior of the gas: specific values of the melting point (–189.6°), boiling point (–187.0°), critical temperature (–121°), and critical pressure (50.6 atm) were determined, establishing the gas as a simple substance^{10b} (the modern respective values are –189.2°, –185.7°, –122.4°, 48.0 atm). Finally, William Crookes reported on the spectrum, which was characteristic and unique.^{10c}

Helium and future plans. Barely two months after Ramsay’s complete description of argon,^{10a} he announced (March 29, 1895)¹¹ his discovery of terrestrial helium. As a courtesy Ramsay had asked Rayleigh to help work out the discovery, but Rayleigh declined—he did not think “working in double harness was very congenial to his habit of mind.”⁷²

Thus, Ramsay was free to launch his own private pursuit of possible other inert gases. At the 67th meeting of the British Association [for the Advancement of Science] in Toronto,

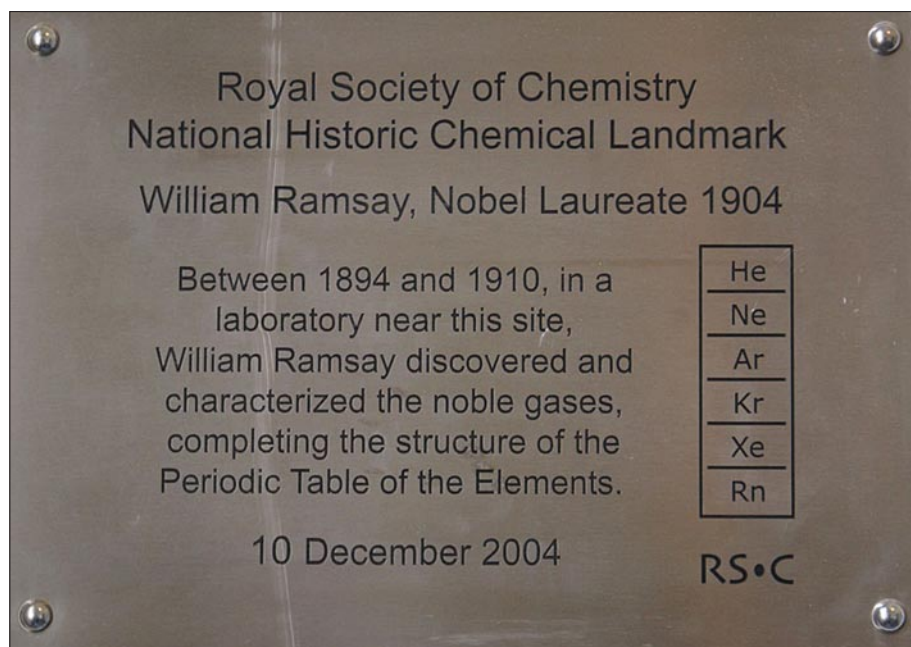


Figure 9. This is the plaque at the entrance in Slade Hall commemorating the important work by Ramsay on the inert gases. Ever since the chemical reactivity of xenon was discovered in 1962, “noble” gases has become the preferred label for the “inert” family of elements.

Canada, on August 19, 1897, Ramsay delivered a presentation on “An Undiscovered Gas,”¹² where he argued that a gas should exist between helium and argon (atomic weights = 4, 40, respectively).

It is interesting that Ramsay used the Döbereiner Law^{5c} of 1817 instead of the Periodic Table to predict this new element. Ramsay was concerned about uncertainties in predictions from the Periodic Table. He was aware of the predictions of Loçoq de Boisbaudran, who, impressed by the prophesy of *his* element (gallium) by Mendeleev,^{5a} used extrapolations from the Periodic Table to predict a much lower atomic weight 36.40 for the “element [argon] between chlorine and potassium.”¹³ In reality, the atomic weight of argon was much greater (40), even larger than that of the following element, potassium (39), in the Periodic Table. In fact, “reversals” of atomic weights had been observed twice before in the Periodic Table (*viz.*, Te/I and Co/Ni)^{5c}, which simply underscored the difficulties in predicting of atomic weights from the Periodic Table. Ramsay preferred the simplicity and success of Döbereiner’s Law of Triads and boldly predicted 20 for the atomic weight for the “Undiscovered Gas.”

Morris Travers.⁴ Morris William Travers (1872–1961), (Figure 8) an undergraduate of University College, London, joined the group of Ramsay in 1894, just after the discovery of argon. The excitement of a possible entire new

group of elements fascinated Travers and he became Ramsay’s junior partner through the discovery of a whole series of inert gases.

Ramsay had been preoccupied with his “undiscovered gas,” but other inert gases were serendipitously discovered first. By 1898 Ramsay and Travers had been preparing argon on a large scale by separating it from the atmosphere with liquid air, now prepared in quantity by the new process developed 1895 by William Hampson (1854–1926).¹⁵ One day a liter of argon, neglected because of other tasks, evaporated over the period of a week. A sudden inspiration of Ramsay led to the study of the residual liquid. Although it exhibited spectral lines of argon, also visible were two new lines, a green and a yellow-green line. It was a new gas! Ramsay named it krypton, for “hidden.”⁷

During another evening, on a hunch Travers stayed late to collect a bubble of residual gas remaining in the pump (which was usually discarded). Ramsay arrived the next day to find they had another gas with new blue lines. They named this gas xenon, for “stranger.”⁷

Next, upon liquifaction of a sample of air, the remaining uncondensed gas was studied. Along with the yellow line of helium, it also exhibited brilliant red lines, a “blaze of crimson light.” It was named neon for “new.”⁷ Although the other heavier gases—argon, krypton, and xenon—could be separated and isolated by a series of fractional low-temperature distillations, the volatile neon could not be separated from helium. Thus, the atomic weights and

other physical properties were known for all the inert gases except neon.

There was only one solution: prepare liquid hydrogen, which would condense neon but not helium. The separation of neon from helium attests to the genius and tenaciousness of Travers—he received no help whatsoever from Dewar, who had earlier prepared¹⁶ liquid hydrogen (May 10, 1898) but published no details.¹⁴ Travers, who had always loved to tinker with appliances, took it upon himself to design and build a hydrogen liquifier from scratch.¹⁴ By July 7, 1900, he was successful, and the helium-neon mixture condensed out 15 mL of neon, whose boiling point of 27°K (-246°C) was only 7 degrees higher than that of hydrogen, 20°K (-253°C). On July 10, 1900, after a final series of purifications, the atomic weight was determined to be 19.98, incredibly close to the prediction at the Toronto meeting¹² in 1897, (the modern value is 20.18). Ramsay exclaimed, as he performed the final calculation beside Travers, “No one will repeat this work for many years to come.”⁶ His words were most prophetic^{6,7}—this was the last experiment that Travers carried out with Ramsay (Figure 9).

In 1904 Travers assumed a Professorship at the University College, Bristol (now the University of Bristol). In 1907 he set up the Indian Institute of Science, Bangalore, India. He returned to England in 1914, and thereafter was involved in many industrial enterprises involving fuel technology and cryogenics.¹⁴

The science of cryogenics. Karol Olszewski (*vide infra*) and Zygmunt Florenty Wróblewski (1845–1888) had first condensed oxygen and nitrogen in 1883 at Krakow, Poland.⁹ These cyogenic techniques depended upon a cyclic compression and then adiabatic expansion. A decade later William Hampson in London, and Carl von Linde (1842–1934) in Munich, developed methods of producing liquid air in quantity; they filed their patents almost simultaneously in 1895.¹⁵ Linde had a long history of research in refrigeration, and his business developed into an international endeavor; “Linde Industrial Gases” is successful worldwide even to this day.

The pioneering work of Hampson and Linde depended not only on adiabatic expansion, but also on the Joule-Thomson effect, where a real (nonideal) gas experiences van der Waals intermolecular effects. Liquifying hydrogen was particularly difficult, because the Joule-Thomson effect at room temperature actually warms the lighter gases (e.g., helium, hydrogen, and neon) upon expansion. In order to take advantage of a negative Joule-Thomson effect, hydrogen gas must first be cooled below the “inversion” temperature (-68°C).

Hampson was a fascinating individual—originally trained in the classics and law, he was self-educated in engineering.¹⁵ He stunned the scientific community by suddenly presenting his own invention of a compact refrigeration unit (size of a washing machine) that in 20 minutes would produce liquid air in liter quantities (Linde's unit was four times as large and took hours to prime).^{17a} Hampson was a quiet, unambitious, generous person; he personally delivered flasks of liquid air to Ramsay's laboratories, literally enabling the discovery of the inert gases. Hampson then passed on to adult education, writing popular books in science and mechanics, later progressing into the medical field where he invented the precursor to the heart pacemaker. Then he moved on to social and economic issues,¹⁵ like Frederick Soddy.^{5f}

James Dewar's contributions.⁹ Sir James Dewar (1842–1923) at the Royal Institution (the home of Sir Humphry Davy and Michael Faraday) is perhaps best known for his Dewar flask and for his liquification of static (liquid, not mist) hydrogen. A chemist by training, he did not deeply understand theoretical physics, and his success with liquid hydrogen has been described as the result of "brute force."⁹ He made an intense effort to liquify helium, but in 1908 he lost out to Heike Kamerlingh Onnes (1853–1926; Nobel Prize in Physics, 1913) of the University of Leiden (Netherlands), who went on to discover superconductivity in 1911. Once it was clear even to Dewar that the inert gases were real, he made an effort to find the "undiscovered element" first hypothesized by Ramsay, but he lost this race as well, even though he had liquified hydrogen before Travers.

James Dewar never published details on his cryogenic appliances, leading to ill feelings from others,⁹ especially Hampson who claimed that Dewar plagiarized his own methods to liquify hydrogen.^{17b} Hampson even went so far as to state that the the "Dewar flask" was actually a "modification and popularization" of the vacuum flask originally invented by Crookes.^{17a} Hampson felt insulted when Dewar said "My results would have been attained had Dr. Hampson never existed. . ."^{17c} With a "strong affinity for disliking people,"⁹ Dewar led a "monastic" life, bitterly criticizing Rayleigh and Ramsay's discoveries. Dewar maintained that it was "not science" to present merely a swath of gaseous mixtures; he wrote letters to *The Times* that Ramsay's gases were fiction and that "argon" was only an allotrope of nitrogen, a perfect analogy of the next member of the same chemical family, phosphorus, which also displayed allotropic forms.⁹

Ramsay's entry into radioactive chemistry. Frederick Soddy (1877–1956) returned from McGill University in Canada^{5d} to England in 1903 to work with Ramsay,^{5f} taking advantage of Ramsay's expert techniques of micro-management with gases. Soddy wanted to know specifically: Was radon (known at that time as "niton") a member of the "argon family"?¹⁸ A supply of radium was now available (Figure 10) and Soddy was able to collect sufficient quantities of this radioactive gas and prove that indeed radon did belong to the new family of inert gases.

The phenomenon of transmutation, discovered by Soddy and Rutherford^{5d} and observed in the generation of helium in Ramsay's laboratories,^{5h} impressed Ramsay greatly. After Soddy left his laboratory for Glasgow, some very strange results began to appear from Ramsay's laboratory. Ramsay's successful prophecy of the "undiscovered element" neon had been a heady triumph, and with his breezy, unruffled manner he went on to make some preposterous claims: radium not only produced radon and helium, but also catalyzed copper to produce lithium and argon, neon from water, carbon from thorium, etc.¹⁹ The announcements in the sixpence newspapers captured the imagination of the gullible layman with convincing news that transmutation occurred at everyone's doorstep: "The philosopher's stone has been found, and it turns out to be a gas!"²⁰ Even Mary Elvira Weeks (author of *Discovery of the Elements*²¹) was taken in; she stated Ramsay's "later work on radioactivity is regarded as even more remarkable than his discovery of the inert gases."²¹

Leaders in nuclear chemistry were quite upset;^{5f} Rutherford said Ramsay, plagued with laboratory contaminations, was "more anxious for scientific notoriety than accuracy."²² Bertram B. Boltwood^{5f} (AXΣ, *Chi '21*) queried, "I wonder why it hasn't occurred to him that radium and kerosine form lobster salad!"²²

Adding to the indignation of scientists, Ramsay's attitude regarding women particularly offended Ernest Rutherford and Madame Curie—Ramsay said that "all the eminent women scientists have achieved their best work when collaborating with a male colleague"²³ and that "lady scientists would better serve by becoming nurses or secretaries to scientists or doctors."^{23c} Hertha Ayrton (1854–1923) a respected researcher in her own right and one of the women specifically mentioned in Ramsay's interview,^{23c} retorted that all of Ramsay's own work also had been done "when collaborating with a male colleague."^{23a}

Perhaps justice was served when Madame Curie and her Norwegian colleague Ellen Gleditsch (1879–1968) proved with a very care-



Figure 10. This monument originally stood at Frankfurter Straße 294 in the center of Braunschweig, Germany (N52° 15.43 E10° 30.77). It reads: "[in German] Herman A. Buchler, 1815-1900, founder of the firm Hermbuchler London, sugar refinery and quinine works, Braunschweig, Buchler & Co., 1858-1958. [in Latin] For many years." It was here that Friedrich Oskar Giesel (1852-1927) initiated the side venture of radium production; Rutherford, Soddy, and Ramsay obtained their radium from him. This monument now stands at the new site of Buchler, Harxbütteler Straße 3, Thune, 8.3 km north (N52° 19.90 E10° 30.39). Giesel was the co-discoverer of actinium in 1902.

ful set of experiments, using platinum apparatus instead of glass, that Ramsay's lithium and other "transmutation products" were contaminants from his glassware.²⁴ Rutherford and Ramsay were jubilant—"I do hope," Boltwood wrote to Rutherford, "now that Ramsay has been treed, that you wont [sic] call off the dogs, but that you keep hammering at him until you have brought him down. He should be absolutely discredited in all matters radioactive, for he entered the field under false colors and has been playing to the grandstand ever since."²² Madame Curie suggested to Ramsay that he might repeat his experiments; Ramsay blithely replied, "I am not going to repeat the experiment on Cu-Li transformation. All I can say is that we succeeded in bringing about this transformation and she didn't."⁶ But the evidence mounted: the neon and argon was contamination from the atmosphere, the carbon

was from oxalate contamination.⁶ Soon the radioactive experiments were dropped and Ramsay's radioactive research was forgotten by others.

Ramsay's final days. In 1912 Ramsay toured America, including a visit to Houston, Texas.⁶ Here he participated in the opening of Rice Institute (October 10–12), presenting three inaugural addresses among a group of seven international scholars and scientists invited for the special occasion.²⁵ Ramsay's talks are interesting as they represent the limits of the classical nineteenth century science to understand the electron, chemical bonding, and radioactivity—all on the eve of the Moseley's atomic numbers (1913–1914), Bohr's quantum atom (1913), Soddy's radio-elements (1914), and Gilbert N. Lewis' (AXΣ, *Sigma* '13) covalent bonding (1916) (Note 2).

Returning to England, Ramsay gave his last lecture at the University College, London, in June, 1912. Always esteemed at his University and popular with his students, a special ceremony was held on March 18, 1914, where the Milbanke painting (Figure 4) was presented to him. Lady Ramsay remarked that the expression on her husband's face in the painting was "that which he has when he is interrupted at his work by a visitor and wants to look as pleasant as possible."⁶ The ceremony²⁶ highlighted his being the "only man to discover a complete Periodic Group of elements." He and Lady Ramsay retired to the country (High Wycombe, Buckinghamshire, 50 kilometers west of London), where he passed away two years later. ☉

In a future issue of *The HEXAGON* we will return to Connecticut,^{5h} the origin of yet another element discovery.

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Notes

1. Henry George Madan (1838–1901) also had suggested the names for the newly discovered satellites of Mars (Phobos and Deimos).^{27a} Madan was originally trained in the classics, but became a chemist (M.A. at Oxford) and was Head of the Science Department at Eton College. Henry was the brother of Falconer Madan (1851–1935), whose granddaughter, Venetia Burney (1918–2009), first suggested the name of the dwarf planet Pluto.^{27b}

2. These Rice inaugural talks include several factual errors, e.g., that Becquerel characterized uranium radiation as "α-rays"; and embarrassingly Ramsay was still insisting that radon ("niton") catalyzed copper to lithium, thorium to carbon, and water to neon. Ramsay never understood the phenomenon of radioactive decay; even Travers admitted Ramsay was "a mere tyro" concerning transmutations.¹⁸ Soddy relates a story where Ramsay pinched a large fraction of his precious radium bromide and to his "absolute horror" held it in a Bunsen burner to determine its flame color (carmine), thus "permanently spoiling the laboratory for any delicate laboratory work."¹⁸

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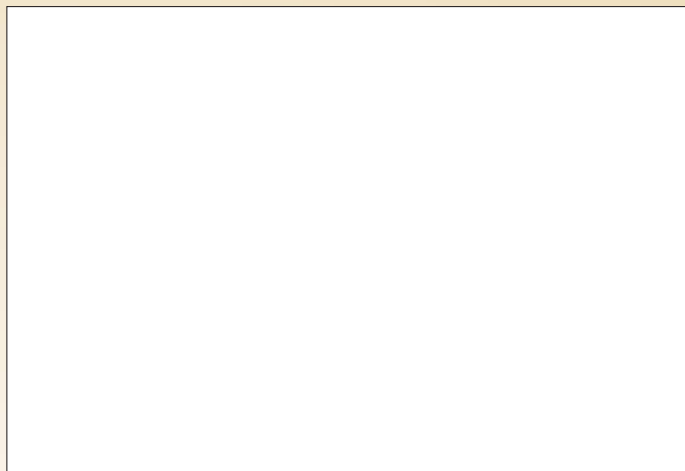
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Alpha Chi Sigma is growing by leaps and bounds!

It has been an exciting year for Alpha Chi Sigma! In 2012, we have added three new collegiate chapters to our ranks: Gamma Psi at the University of Toledo, Gamma Omega at Widener University and Delta Alpha at the University of Rhode Island. We've also added to the professional branch with the New Jersey Professional Chapter, the Boston Professional Chapter and the Wisconsin Professional Group.

Also, Brothers around the country have grown our fraternity's reputation by acting as ambassadors for Alpha Chi Sigma while conducting chemistry merit badge and Chemistry of Color programs, reaching out to the public with chemistry demonstrations, judging science fairs and so much more. All of these activities indicate that many men and women have found that our Brotherhood and its Three Objects have value in their lives and careers.

Come grow with us!

As we do each year, we are asking for your support as we continue to bring Alpha Chi Sigma to new and familiar institutions, increase our membership and expand collegiate and professional chapter programs. A \$50 contribution will designate you as an active professional Brother and will help support our endeavors. A larger donation will do even more. You can donate by using the attached envelope or by visiting www.alphachisigma.org/donate. [Be sure the envelope is included on the same page as this article.]

Your annual contribution:

- helps meet our operating obligations and allows the Fraternity to improve programming, enrich member communications, support outreach activities and continue to expand.
- allows you to vote for Professional Representatives. Use the ballot sent with your solicitation letter in September or contact the National Office to receive one. If you make an online contribution, an electronic ballot will be provided. Ballots must be postmarked by November 30, 2012.
- entitles you to receive all four issues of *The HEXAGON*. You also will be recognized in the Fall 2013 issue.

As our Fraternity works to fulfill the needs of our growing membership, your financial support is essential. Your annual professional contribution is vital to our continued growth. Please give generously today.

Watch your donation grow!

Matching gifts

Many companies match the contributions their employees make to qualified nonprofit organizations. Alpha Chi Sigma Fraternity is recognized as a nonprofit 501(c)3 tax exempt educational organization. Contact your company's Human Resources department to let them know about your donation to our organization. Encourage them to contact the National Office at (800) 252-4369 or national@alphachisigma.org if they need more information to match your gift.

5 percent to active collegiate chapters

Each year, 5 percent of active chapters' alumni donations are returned to their chapters. Because this money was given as a contribution to a 501(c)3 tax-exempt organization, it only can be used for charitable, educational or professional purposes that support Alpha Chi Sigma's tax exempt status.

Be an active professional member for life

The Reserve Fund helps provide for the long-term financial security of the Fraternity. Brothers who donate \$2,000 or more in contributions to the Reserve Fund, in addition to their annual donations, become Reserve Fund Members and are granted lifetime active professional status. Contact the National Office at (800) 252-4369 or national@alphachisigma.org to request more details about the Reserve Fund. Begin your commitment today to the future of Alpha Chi Sigma.

Alpha Chi Sigma Fraternity is a nonprofit 501(c)3 educational organization. Your contribution is tax deductible as permitted by law.

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- Expand the Tie Dye Outreach Program to all collegiate chapters.
- Provide training and education to our growing chapters.
- Improve technology to enrich member communications.
- And more!

This check could do a lot.

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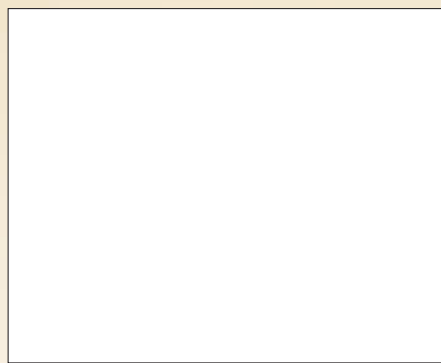
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An archeologist in Xi'an, China works at the Terra Cotta Warriors Museum.

A portrait in paying attention

GE Note: During a visit to Xi'an during October 2012, I was captivated by the quiet serenity of this young archeologist concentrating on his task. Simple quiet work seems so rare that I thought I would honor it with an entire page for you to contemplate.

In 2009, the *New York Times* did a report on a book by Winifred Gallagher, called *Rapt: Attention and the Focused Life* (Penguin Press, 2009). I quote from that report, here:

[Gallagher] recommends starting your workday concentrating on your most important task for 90 minutes. At that point your prefrontal cortex probably needs a rest, and you can answer email, return phone calls and sip caffeine (which does help attention) before focusing again. But until that first break, don't get distracted by anything else, because it can take the brain 20 minutes to do the equivalent of rebooting after an interruption.

"Multitasking is a myth," Ms. Gallagher said. "You cannot do two things at once. The mechanism of attention is selection: it's either this or it's that." She points to calculations that the typical person's brain can process 173 billion bits of information over the course of a lifetime.

"People don't understand that attention is a finite resource, like money," she said.

<http://www.nytimes.com/2009/05/05/science/05tier.html>

2012 Awards Wrap-Up

2012 ACS Award in Pure Chemistry



Professor Oleg Ozerov and Gary Anderson, OA, Alpha Eta 1962

The 2011 ACS Award in Pure Chemistry was presented to Professor Oleg V. Ozerov from Texas A&M University. First awarded in 1931 to two-time Nobel Prize-winning chemist Linus Pauling, the award celebrates independence of thought and originality in research among chemists 35 and under. It is bestowed annually by the ACS "to recognize and encourage fundamental research in pure chemistry carried out in North America by young men and women who have accomplished research of unusual merit for an individual on the threshold of his or her career."

Ozerov, whose research focus is synthetic organometallic chemistry and its applications in catalysis and energy-related problems, is cited "for the discovery of novel bond-making and bond-breaking reactions mediated by transition metal and main group derivatives."

Among other noteworthy projects, Ozerov is a principal investigator in a novel National Science Foundation-funded Center for Chemical Innovation (CCI) for solar energy known as the Powering the Planet Program. The effort seeks to capitalize on unique chemical ways to harness this model energy source and revolutionize a planet in desperate need of fossil fuel alternatives.

In general Ozerov and his research group engage in molecular design, targeting either unusual molecular structures or new ways to make or break chemical bonds — worthwhile pursuits that he notes are absolutely necessary to ensure future progress in his profession and so many others.

"Chemical reactions are essentially sequences of bonds between various atoms being broken and formed in a particular order," Ozerov added. "Therefore, understanding how you can do these elementary steps is crucial for the development of new catalytic processes."

2012 AIChE Award in Chemical Engineering



Professor Nicholas T. Abbott

The 2011 AIChE Award in Chemical Engineering recipient is Nicholas T. Abbott, the John T. Sobota and Magdalen L. Sobota Professor of Chemical and Biological Engineering from the University of Wisconsin-Madison. Professor Abbott earned his Bachelor of Engineering (Honors) in 1995 from the University of Adelaide, Australia, and his PhD in Chemical Engineering from MIT in 2001.

He has published over 230 papers, including 7 in Science, awarded more than 37 US patents that have led to the founding of two companies. His group pioneered the use of liquid crystalline materials for amplification of bio/molecular interactions, and co-founded the company Platypus Technologies LLC to commercialize associated technology. They have also designed and synthesized redox-active and light-active amphiphiles, which has recently yielded the basis of new methods for spatial and temporal control of gene delivery. He served as the Chairman of the Department of Chemical and Biological Engineering at University of Wisconsin-Madison from 2009–2012.

2012 Alpha Chi Sigma Scholar

Jacob Wagner, Gamma 2009, is pursuing a doctorate degree in polymer simulation at Massachusetts Institute of Technology (MIT). He graduated summa cum laude from Case Western Reserve University (CWRU) in 2012 with bachelor's degrees in chemistry, physics and polymer science and engineering.

In addition to serving as webmaster for Gamma Chapter, Jacob also held leadership



Jacob Wagner, Gamma 2009

positions in several other campus organizations, including the Case Amateur Radio Club, the Case Art History Club, Tau Beta Pi and Mortar Board.

At CWRU, Jacob received numerous awards and scholarships, including the President's Scholarship from CWRU, the Ohio Academic Scholarship from the Ohio Board of Regents and several amateur radio scholarships. He was elected to Tau Beta Pi in 2009 and Mortar Board and Phi Beta Kappa in 2011.

Jacob has pursued his changing research interests through internships, research experiences for undergraduates (REUs) and undergraduate research. He has worked as a summer lab assistant at Sherwin-Williams and an intern at the Goodyear Tire & Rubber Company. He also pursued an REU at MIT, determining the most effective way to make a substrate for mesenchymal stem cells.

Jacob pursued two senior projects at CWRU. He currently is preparing manuscripts about the projects for the Journal of Chemical Physics and the Journal of Non-Newtonian Fluid Mechanics.

2012 Priscilla Carney Jones Scholarship

Priscilla Carney was born on April 30, 1937. She attended Wheaton College in MA, Bryn Mawr College and the University of Wisconsin, Madison, where she earned a Ph. D. in chemistry in 1968. She was among the first women to earn the doctorate in chemistry at



Alysha Moretti Widener University

UW. While in Madison, she met and married her husband of nearly forty years, Paul R. Jones, Beta Eta 1971, OA. Priscilla served as a research associate and an adjunct professor in the Chemistry Department of the University of North Texas for many years. It was her wish to establish a scholarship for a woman in her junior or senior undergraduate year majoring in chemistry or chemistry-related science. It is awarded on the basis of both need and scholarship. The selection committee is a joint subcommittee of the Women Chemists Committee and the Younger Chemists Committee of the American Chemical Society. The 2012 awardee is Ms. Alysha Moretti.

Alysha Moretti is a senior at Widener University in Chester, PA completing a dual major in Chemistry with an ACS Certification

Calling Alpha Theta for 2021

Attention Alpha Theta Brothers!

The *Alpha Theta* Chapter of Alpha Chi Sigma at the University of Iowa is going to celebrate its centennial in 2021. I am looking for Brothers who might be interested in helping plan the celebration. Now that may seem like a long ways off—but if you have big dreams you have to start early. Typically, chapters have dinner reception with speakers, a history of the chapter is prepared, everyone has a good time and takes home a souvenir. If you are interested in helping out with any aspect of this (and I know it is a long way off) let me know.

I am hoping that we can raise the bar on celebrations. I would like to see us leave a lasting mark on the University of Iowa with a endowed lecture series, scholarship, internship, chair, or other program. Does this sound interesting?

Do you have good ideas on exactly what we should do for a legacy? A total of 1047 brothers have initiated at *Alpha Theta*, and 926 are still living! We should be able to accomplish a lot. To get involved, contact Grand Recorder Patrick Johanns, *Alpha Theta* 1981, at GR@alphachisigma.org or by mail at the address listed on the back of *THE HEXAGON*. Go Hawks!

Patrick Johanns

2181 Robin Hood Ln, West Lafayette, IN 47906

765-497-9274 (H), 765-494-4431 (O), 765-404-7347 (M)

itated toward Chemical & Biomolecular Engineering. He will be graduating from UTK with a GPA of 3.6 and Cum Laude Honors with a B.S. Degree in Chemical Engineering. Future goals may entail the earning of a Masters Degree in Engineering after some professional work experience. In his spare time, he likes golfing and skiing and listening to a variety of music.

2012 Beta Eta Distinguished Teaching Assistant Award

Uma Fogueri graduated from Goa College of Pharmacy (Goa University) in India with a Bachelor's degree in Pharmaceutical sciences in 2008. She joined UNT in Fall 2010. She writes "I feel honored to receive this award. I enjoy teaching a lot. I guess it has to do with the fact that I come from a family of



Uma Fogueri
Beta Eta 2012
University of North Texas

teachers. I want to join the teaching profession after completing my graduate studies." She is doing research in the field of Computational Chemistry at UNT. "In my spare time, I love to travel and play cricket," Fogueri says. "And I have also represented my state of Goa for National Cricket Championship."

2012 Dunlap Scholar and Dunlap Grant



Emily Yedinak
Iota 2010



Alexandria Williams
Iota 2011

Emily Yedinak, *Iota* 2010, is the 2012 Dunlap Scholar. She is currently a fourth-year student at Rose-Hulman Institute of Technology pursuing a dual degree program in both chemical engineering and chemistry with a minor in Spanish. She is currently working as an Associate Chemical Engineering intern at the ArcelorMittal steel plant at Indiana Harbor where chemistry plays an integral part in her work. After graduation, Emily hopes to pursue

and Biochemistry. Alysha is a member of the American Chemical Society, Phi Lambda Upsilon and Beta Beta Beta honors societies, and currently holds a 3.9 GPA. She has received several awards through Widener University honoring her academic achievements including the CRC Freshman Chemistry Award, the David Arnold Award, and the POLYED Achievement Award in Organic Chemistry.

Alysha has worked in Prof. Loyd Bastin's Research Lab at Widener for the past two years on projects in the field of biochemistry. Her main focus has been a project aimed at discovering a mechanism for the process by which zebra mussels form their shells through biomineralization. She has recently completed her senior thesis on this project, which primarily sought to isolate, characterize, and determine the effects of the total mixture of proteins on calcium carbonate growth in vitro. Results of this research have been presented at the 2012 National ACS meeting in San Diego as well as the Delaware Chapter of the ACS annual poster session, where Alysha was awarded 2nd place in the undergraduate division. Alysha has also received research scholarships for this work including the Sebastian and Sharon Faro Research Award and the William R. Bailey Scholarship and Research Award.

In addition to carrying out research, Alysha is very involved in the Chemistry department at

Widener University. She partakes in the development and implementation of Chemistry Outreach activities intended to develop an interest in science while promoting science literacy for grade school students. She has participated in demonstrations with groups of students from several schools and day camps in the area over the past three years during Haunted Walks for Halloween, in celebration of Mole Day, and other planned activities. She also tutors general chemistry and organic chemistry courses and has worked as a teaching assistant in chemistry courses for pre-service teachers. Upon graduation, Alysha plans to attend a Ph.D. program in bio-organic chemistry or biochemistry with the intent of having a career in pharmaceutical or medical research.

2011 Cooper Awardee

Jack Ryan Hay was born in Nashua NH in 1989. He moved with his family to Knoxville in 1994 and completed his High School education there. Although his original intent was to enter UTK for Mechanical Engineering, it was during his sophomore year that he grav-



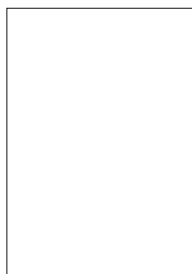
Jack Hay

2012 Awards Wrap-Up

a doctorate and eventually work in a material science-related field.

Alexandria Williams, *Iota 2011*, is the recipient of the 2012 Dunlap Grant. She is a senior from North Pole, Alaska. She is majoring in Biology with a minor in Chemistry. She has participated in an REU at University of Wisconsin-Madison, and this past summer was an Amgen scholar at Stanford University. After graduation, she plans to pursue a Ph.D. in Microbiology or a related discipline.

2012 Gamma Eta Scholar



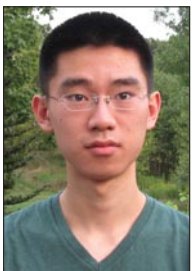
Catherine "Cat" Higgins
Gamma Eta 2010

Catherine "Cat" Higgins is a senior chemistry major at Marshall University where she has been a member of the *Gamma Eta* Chapter of Alpha Chi Sigma since the spring of 2010. Catherine is originally from Montgomery, West Virginia, and is a graduate of Charleston Catholic High School,

where her interest in science and math began. She has had many opportunities to explore different areas of chemistry, including a summer internship in the raw materials lab of West Virginia Manufacturing/ Globe Metallurgical and taking part in undergraduate research at Marshall. Catherine also tutors chemistry, math and biology at the University Tutoring Center.

In her spare time, Catherine enjoys running and training for road races. She enjoys any time spent outdoors, especially fishing and roasting marshmallows on the riverbank, at home with her family. Always interested in trying something new, her latest endeavors include learning to golf and adopting a cat named Charlie. Upon graduating, Catherine plans to attend pharmacy school.

2012 Alpha Beta Alpha Chi Sigma First-Year Award



Justin Wang,
University of Michigan

Every year, the *Alpha Beta* chapter in cooperation with the Department of Chemistry at the University of Michigan, recognizes the high academic achievement and social engagement of a first-year student as a

Alpha Chi Sigma partnership with Gradspring

According to the Associated Press, one in two recent college graduates is unemployed or underemployed. By partnering with Gradspring, Alpha Chi Sigma is working to ensure that its members do not suffer this fate. Gradspring is a career resource for college seniors and recent graduates that focuses only on career opportunities that:

- Require fewer than two years experience for employment consideration.
- Require a bachelor's degree for consideration.
- Pay a salary commensurate with industry/geographic standards.

Gradspring does not post multi-level marketing, work-from-home, commission only or pay-to-work jobs. In addition to jobs, Gradspring also offers its members access to a bundle of services that assist in the transition from student to working professional. These services are available to premium Gradspring users and include:

- Gradspring profile (a great way to showcase yourself to future employers).
- Gradspring career planning tools and advice.
- A free CareerScribe profile.
- Regular online career fairs.
- Complimentary resume critique.
- Custom resume and cover letter preparation.

Gradspring is currently working with hundreds of employers across a wide spectrum of fields and adds roughly 100 new jobs per day to its database. Alpha Chi Sigma, through its Gradspring partnership, is offering its members, both young alumni and collegiate, a deeply discounted Gradspring subscription. The terms of the discount are:

Membership Term	Alpha Chi Sigma	Standard Rate
1 Month	\$17.50	\$35.00
3 Months	\$37.50	\$75.00
6 Months (with Guarantee)	\$62.50	\$125.00

According to founder Sean Clem, "We knew this model was different, but I believed at our founding—and I believe now—that there is a class of student and recent graduate that understands, intrinsically, the value of what we at Gradspring offer. Because our members are willing to put some skin in the game, employers take them more seriously. Further, many of the jobs on Gradspring are not posted anywhere else on the Web. Finally, there is a lot to be said for the peace of mind associated with knowing that all of our jobs are pre-screened for quality." Clem added, "We actually refuse more jobs than we post; we want to make sure that our customers, the students or parents who subscribe, truly gets what they are paying for from our service."

The management of Gradspring is always interested in hearing the input from our customers or from people who just want to learn more about the service. You can contact the CEO personally at sean.clem@gradspring.com.

part of the department's undergraduate awards program. This year, the recipient of the award was Justin Wang. Justin is from the Greater Lansing (MI) area, and he is currently studying

chemistry with the aim of continuing his education in graduate school. He describes his interests as daydreaming, retro video games, and staying up late.

Wyvern Pin Reports

Gamma Chapter's Service Road Trip to the National Science and Engineering Festival

Submitted by: Amy Coe, *Gamma 2010*, Angela Crise, *Gamma 2010*, and Peter Schmidt, *Gamma 2010*



Gamma Brothers at the National Science and Engineering Festival in Washington DC.

The brothers of *Gamma* Chapter had the opportunity to attend the 2nd USA Science and Engineering Festival in Washington DC. This festival is geared towards encouraging the next generation to be interested in STEM fields. This was the second time that *Gamma* Chapter had the opportunity to attend and host a booth. Last year, the brothers spent a weekend on the National Mall launching off film canister rockets filled with vinegar and baking soda, gathering a huge crowd at the rowdiness of their booth. This year the festival was moved indoors, but the brothers still had a great time showing and explaining science concepts to the young and young at heart with much less mess.

This year, our exhibit focused on the "Chemistry of Light," where visitors could participate in a variety of activities focusing on the

science behind light. At one section of the booth, bracelets were made with ultra-violet (UV) activated beads and regular beads. At another section of our booth visitors could discover the difference between fluorescence and phosphorescence. We also demonstrated tonic water, which contains quinine, will fluoresce when exposed to UV light due to the organic solute. We compared this behavior to an unbroken glow-stick, which will fluoresce also when exposed to UV, and will phosphoresce when the chemicals are allowed to combine and produce the necessary energy to emit light. Finally, participants could learn about the atomic emission spectrum of various elements in spectrum tubes along with white light by looking through a makeshift spectroscope (fashioned from cardboard boxes and a CD) to view the spectrum given from various sources of light.

There were many other booths at the festival that members of *Gamma* Chapter had the opportunity to explore when not working. Some members were lucky enough to meet Bill Nye, the MythBusters Jamie Hyneman and Adam Savage, and Big Bang Theory's Mayim Bialik (Amy Farrah Fowler). Many organizations had booths around the festival. The American Chemical Society did the typical acid and baking soda experiment to inflate a balloon; however, they used citric acid instead of vinegar for the slower reactivity. Some brothers even had the chance to run across a pool of cornstarch and water at another booth.

Two alumni from our chapter are working at the National Institute of Health in Washington, D.C. and were able to visit and help out with the booth. Since we worked the booth in shifts, time was available for visiting and exploring Washington, D.C. Some brothers were able to explore the Botanical Gardens and the Museum of Natural History. Several brothers were able to go see many of the sites around the National Mall including the Washington Monument, Lincoln Memorial, the World War II Memorial, and the new Martin Luther King Jr. Memorial. The entire group was able to get together for a nice dinner in Chinatown on Saturday night, after which a few brothers went to Georgetown to get cupcakes from Sprinkles and visit the famous DC Cupcakes.

Overall the trip was a wonderful time. The 7-hour car ride from Cleveland to DC, although long, provided a great time for brotherhood bonding (with many opportunities to sing 90's pop songs together). In addition to teaching children and parents science concepts, the event provided good exposure of both Alpha Chi Sigma and our university. Many of the parents were interested in who we were and what our organization is all about. *(continued)*



Four Levels of Wyvern Pins for Science Outreach

Wyvern Pins for Science Outreach

Alpha Chi Sigma is strongly committed to the science education of our nation's youth. To encourage and recognize participation in science outreach activities, the Fraternity has established a program in which participating members earn wyvern pins. Science Outreach Programs are broadly defined as any activity that promotes the Second Object of the Fraternity among pre-college age groups.

Members strive for four levels in the Wyvern Pin Program, each having a corresponding colored pin:

- First Level (Black Pin): One activity
- Second Level (Green Pin): Three activities within a 12-month period
- Third Level (Red Pin): Seven activities within a 24-month period; at least one must involve scouting. One activity may be aimed at a general audience rather than a pre-college audience.
- Fourth Level (Blue Pin): Fifteen activities within a 36-month period. At least two must involve scouting. Two activities may be aimed at a general audience rather than a pre-college audience. The Brother also is required to submit a brief article to *The HEXAGON*, describing the activity, along with at least one photograph showing the interaction between the Brother(s) and the audience.

Additional information, as well as the relevant forms, can be found at the <https://www.alphachisigma.org>



Epsilon MA Kim Long, 2008, and Katie Mika, Epsilon 2009, preparing for the food science event, showing off the proper eye protection equipment.

Epsilon at the Indiana State Science Olympiad Tournament

Submitted by: Katie Mika, *Epsilon 2009*

By 7:00 am on March 24, 2012, nearly 1600 middle school and high school students, along with affiliated parents and coaches, swarmed the Indiana University Bloomington campus. These students were not there to compete in any sporting event or music competition, they were on campus to show off their skills in the sciences and compete in the 2012 Indiana State Science Olympiad Tournament.

Science Olympiad is a K-12 science competition, broken down into three divisions, where teams of 15 are formed to compete in 23 different events. These events span across the sciences and engineering. Some examples include chemistry lab (focusing on redox reactions), forestry, helicopter egg drop, and many more. Students around the country all compete at various levels trying to qualify for the national competition in May, which took place this year at the University of Central Florida. Due to the number of teams registered, in Indiana there is a regional competition to qualify for the state tournament. By the state tournament, these teams have been practicing for seven months and are ready to show what they know.

For the 2012 Indiana State Science Olympiad Tournament, I was personally in charge of the Food Science event and oversaw the running of over eleven other events, including the Chemistry Lab run by Alpha Chi Sigma. Beyond writing, running, and grading exams, brothers assisted in nearly all of the events that



Some of the teams in the middle of their exams while Kaite answer questions in the back. In the foreground is one example of a viscosity tester a team built.

were run that day and were an integral part of the success of the tournament.

For me, the day started at 6:30 am, and the competitors arrived and events started running at 8:30 am. My event, Food Science, was for only for middle school students where the competitors had to be familiar with the chemistry and biology behind baking. They also had to build their own viscosity tester in order to calculate the viscosity of an unknown I gave them (which happened to be molasses). The exam was difficult, but some teams excelled. After the grading was over it was back to solving problems that had arisen in other events during the day.

After the actual competition, there was a break for the students to eat while we prepared for the awards ceremony. For each event, the first- through fifth-place awards are announced and the students come on stage to the cheers of their teammates, family, and the other competitors, to receive their medals. I was lucky enough to assist with the medal ceremony this year; watching the kids smile as much as they did when they placed was great. Beyond the individual medals, the top five teams receive trophies and the top two teams will go to the national tournament. In the middle school division, the second place team found out they made it to nationals when they were already on stage. They were incredibly excited! In the high school division, both teams were crying tears of joy because they were so excited to move on to the next level.

Science Olympiad and Alpha Chi Sigma have both been a large part of my life over the years and I was extremely excited to be able to bring them together. My fellow brothers did an amazing job and were an integral part of a well-run competition. The work that *Epsilon* Chapter has done to uphold our second object is remarkable. I am proud to be a part of this chapter, and this fraternity, and I cannot wait for our next event!

Adventures in Scouting with Pi Chapter

Submitted by: Elizabeth Mitchell, *Pi 2009*

Working with the Boy Scouts and Girl Scouts of America is a wonderful opportunity to promote the second aim of the fraternity as an outreach to students, but the programs bring much more than just fulfilling a Wyvern pin requirement. I have been active in scouting my entire life, and am a lifetime Girl Scout member and Gold Award recipient, as well as a merit badge counselor for the Boy Scouts. But even if you or your chapter never been involved with scouting, you can start building those connections to not only help your chapter increase their outreach, but also make a difference in these young people's lives through your activities in scouting.

It is important if asked to work with Boy Scouts, or if your chapter wants to get more involved in scouting, to do your research. The best thing your chapter can do is to have at least



Elizabeth Mitchell (r), Pi 2009, conducts a chemistry activity.

one member become a certified merit badge counselor so that they are able to sign off on the card when all the requirements are completed. But if that is not a possibility, all brothers participating in the scouting event should know what the objective is.

For the chemistry merit badge, a workbook needs to be completed by each scout as well as a few additional tasks, such as touring a lab or speaking with a scientist in the field. It is important to stress that these tasks need to be completed before the workshop or incorporated as part of the activities if possible for the scout to complete the merit badge. Other activities include cooking an onion, putting an iron nail into a copper sulfate solution, and creating a Cartesian diver, all easy tasks to accomplish as long as you are prepared for the session. And of course, safety is always a priority so make sure there are goggles for brothers performing demonstrations and for scouts if you are able to make it more hands-on.

In order to make sure we are prepared for our annual Boy Scout merit badge day on campus or if we are asked to host a workshop at a local council, we have put together our Boy Scout box, which contains most of the necessary items to running a workshop. We have also created a packet for the boys, which include the workbook and the required MSDS sheets. We also have an answer key for the brothers running the session with all of the information found in the Boy Scouts chemistry merit badge book, which is available at local council stores.

For working with Girl Scouts, it is a bit less structured, but it is equally important to know what is expected of you and what you hope to accomplish with the workshop. While there is no chemistry badge, troops have the option to

“Make Your Own” badge, based on what they feel they have learned through their experiences. For younger girls, simple demo shows or fun activities can interest them in science development into future programs.

The work that I’ve done with scouting, both on my own and through Alpha Chi Sigma, has taught me many desirable skills like leadership, teamwork, and critical reasoning. Hopefully, your chapter is able to build a working relationship with local scouts and you can learn these skills as well. Not only are you helping young people continuing on in a very worthwhile organization, it also helps get your Wyvern pins.

Adventures in Scouting with Beta Chapter

Submitted by: Audra Benzschawel, Beta 2009, Mason Hart, Beta 2010, and Raj Mehta, Beta 2010

Alpha Chi Sigma - Beta Chapter has grown so much in its recent history. Not only have we grown as a chapter, but our presence on the University of Minnesota campus, as well as our presence in the community, has grown tremendously. This past year alone, the number of outreach events that we participated in was one and a half times the number that was organized last year, and the total number is anticipated to increase in the future.

For the second year, the Beta Chapter of Alpha Chi Sigma organized and hosted an annual Boy Scout Merit Day Event that opened up the University of Minnesota-Twin Cities campus to 100 boys scouts between the ages of 11 and 16 and gave them an opportunity to earn two science merit badges. The concept for



Audra Benzschawel, Beta 2009

the event came from one of the brothers, whose family has a long line of involvement with the Boy Scouts, and has had personal knowledge with the difficulty to earn science badges based on the given requirements. As well, the event would hopefully cultivate pre-college boys’ interests in different fields of science and promote involvement among the different student groups. As well, a huge undertaking for the event was to make it completely free for the scouts to attend, so by taking advantage of the student group small grant program that the College of Science and Engineering offers each semester, we were able to secure enough funding to cover all costs for each student group’s lesson plan, lunch for all scouts and volunteers, and any administrative/facilities needs.

When planning for the Boy Scout event, the main goal was to provide boys with the opportunity to specifically earn science merit badges that are difficult to earn given the nature of the badges requirements. To provide a variety of badges, we called upon other science and engineering student groups to offer their expertise ranging from nuclear engineering and robotics to geology and material composite, and Alpha Chi Sigma would host the Chemistry merit badge. Each group was expected to develop a two-hour lesson plan that included both large group presentation and hands on activities to keep the scouts engaged. By developing this event and working with the different groups, our chapter was able to foster a stronger relationship with the College of Science and Engineering to help promote future collabora-

(continued on page 63)

IN MEMORIAM: SPECIAL TRIBUTE

Nearly all of these images are courtesy of John R. Becker, Iota 1986

Jonte, J. Haworth "Howie," Beta Beta 1941, passed away on July 27, 2012.



Alpha Chi Sigma mourns the loss of OA J. Haworth "Howie" Jonte, who passed away July 27, 2012, at the age of 93.

Dr. Jonte (known to everyone as "Howie") received his bachelor's degree in chemistry from the College of the Pacific, where his father, J. Herbert Jonte, was a professor of geochemistry. Howie went on to graduate school at Washington State University and was initiated by *Beta Beta Chapter* in 1941.

After receiving his master's degree, Howie joined Shell as an analytical chemist. In 1946, he returned to academia and began teaching at Iowa State University. In 1951, he moved to the University of Arkansas, earning a doctorate degree in 1956. He attended his first Conclave in 1954. After leaving Arkansas, he returned to industry and worked for Texaco in Houston, Texas, where he became involved with the Houston Professional Chapter and served as Southwestern District Counselor.

Howie was instrumental to the creation of *Beta Omicron Chapter* at the University of Houston. He attended his second Conclave in 1958 and has attended every Conclave since. In 1966, he returned to academia, joining the chemistry department at the South Dakota School of Mines, where he helped create *Beta Phi Chapter*. He was elected to the Supreme Council in 1966, serving as Grand Master Alchemist from 1970 to 1972. Howie had the unique opportunity to be at his father's initiation in 1961 at Beta Pi and also took part in his son J. Michael Jonte's initiation at *Beta Phi* in 1973 and his daughter Dorothy Jonte Engelking's initiation at *Beta Phi* in 1981.

Howie is survived by his wife of 70 years, Eloise Jonte; his three daughters, Barbara Boswell, Sharon Harrison and Dorothy Engelking, *Beta Phi* 1981; his son, J. Michael Jonte *Beta Phi* 1973; seven grandchildren; and five great-grandchildren.

The J. Haworth Jonte Award for the Most Improved Collegiate Chapter is awarded at each Conclave to recognize the collegiate chapter that demonstrates the most improvement over the previous biennium.

Grand Chapter Motion 42

Made by Jennifer Showerman, GMA

Second by Randy Weinstein, GCA

Be it resolved that the Grand Chapter stands for a moment of reflection to consider the many examples of Brotherhood demonstrated by J. Haworth "Howie" Jonte, Beta Beta 1942, OA, who passed away July 27, 2012.

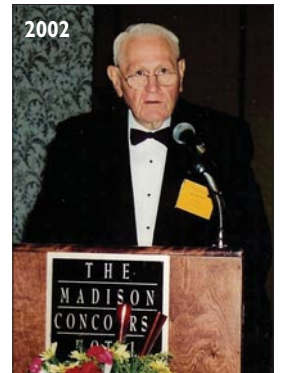
First reading: 7/28/12

Consideration date: 7/28/12

Passed Unanimously



"Howie's legacy is wide and deep. He was a role model of professionalism and comportment. He demonstrated, in so many ways, a lifelong commitment to the fraternity. As they say in the army, he "died with his boots on." Knowing Howie, I think he would not have it any other way. RIP, Howie... you lived, you loved, and you left a legacy. You will be missed."—Bob Stevens, Beta Delta 1979



J. Haworth "Howie" Jonte (1918–2012)

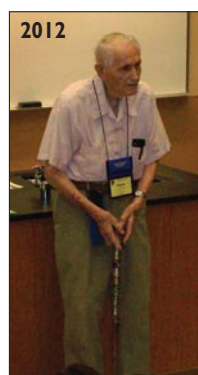
J. Haworth "Howie" Jonte attended his second Conclave in 1954, and was there for every one since. His presence was felt most significantly during the most recent Conclave, in July 2012, because he was once again present for the start of the proceedings, but he passed away before the end of the week.



The memorial moment was held at the stroke of 10:00 pm on Saturday, July 28, 2012. Grand Historian and OA D. Mitch Levings, Beta Delta 1975, provided the collected Grand Chapter with these remarks:

Frank Petura, H. P. Holman, H. B. North, J. Howard Matthews, Harry Curtis, Stroud Jordan, Robert Burns, P. D. Manning, C. A. Mann, Marion Dice, H. E. Wiedemann, V. W. Meloche, William Higburg, Walter Ritchie, W. P. Gaw, A. W. Chapman, Clyde B. Hutchison, Merle Griffin, Walter T. Schrenk, Ron Warren, John Kuebler, Reed Brantley, Frank Zvanut, Marv Schneller, Burt Tiffany, James F. Miller, Ed Schneider, Eldon Bauer, Ed Minnerly, W. Mack Barlow, Ron Pflaum, Paul Jones...

These, the departed Brothers of the Order of Altotus, welcomed the spirit and soul of Brother J. Haworth Jonte as he moved from our physical world



to their spiritual world. It is fitting that we are saddened by the passing of Brother Jonte, but I challenge us to look beyond our grief and our sorrow . . . to celebrate the exceptional privilege of having Brother Jonte in our midst for the time that we had.

Officer of collegiate and professional chapters, District Counselor, Supreme Council, Order of Altotus, and service on numerous committees and panels, Brother Jonte has served the fraternity with loyalty and commitment.

I first met Howie at the 1978 Conclave in Denton. I remember Howie as warm, approachable and completely professional. As I progressed through the fraternity, my relationship with Howie deepened. He embodied all three objects and was always available when I needed him. He was an advisor, a source of information and of guidance. In my role as Grand Historian, Howie has given me boxes of files and folders filled with documents that reveal not only the facts, but the character and devotion Howie brought to fraternal issues.

Howie not only influenced my fraternal service, but he was an influence on others. I invite all who have special memories of this remarkable man to step up to the front of the room and share those memories.

Thank you all. Now, let us stand and raise our arm in final salute.

To Howie.

Supreme Council Proposition 4399 (7/27/12) Maker: Grand Master Alchemist Jennifer Showerman

The Supreme Council notes with sadness the passing of Brother J. Haworth Jonte, *Beta Beta 1942, OA*, who served the Fraternity faithfully as a District Counselor (1972–1985), Grand Professional Alchemist (1966–1970) and Grand Master Alchemist (1970–72). He was the recipient of the Kuebler Award in 1977. Condolences are extended to his family in their time of bereavement on behalf of the Grand Chapter. Passed Unanimously



"For all his many accomplishments in many fields, I remember most how modest and approachable Howie was, and what a help he was to a new member of the Supreme Council." —Maurice Burse, OA, Rho 1967

IN MEMORIAM

ABBOTT, Jr., Wayne H., *Alpha Upsilon* 1948
ADLER, Charles R., *Alpha* 1948
ALLDREDGE, Glenn E., *Alpha Eta* 1948
ALSUP, Richard G., *Kappa* 1949
ARNTZEN, Clyde E., *Alpha Chi* 1940
ASWELL, Donald Lee, *Psi* 1945
BARTELS, Henry J., *Tau* 1948
BAUER, Richard H., *Beta Delta* 1950
BOBO, Jr., Frank E., *Beta Epsilon* 1943
BREEN, George G., *Alpha Eta* 1950
BUSH, David G., *Beta* 1949
CROLL, Joel P., *Upsilon* 1946
CUSTER, C. Robert, *Beta Delta* 1951
DAILEY, John L., *Eta* 1957
DARIGO, Carl E., *Alpha Epsilon* 1945
DIETSCH, Frederick F., *Alpha Upsilon* 1940
DOTY, Jr., Paul M., *Nu* 1939
EMERY, Alan J., *Beta Xi* 1957
FELLEY, Donald L., *Zeta* 1947
FILLMAN, Jack M., *Nu* 1940
FISHER, Ray W., *Alpha Chi* 1942
FISSEL, John W., *Nu* 1934
FITZGERALD, Jerry M., *Eta* 1957
FITZGERALD, Jr., William J., *Chi* 1944
FLORIN, Roland E., *Zeta* 1947
FREIER, Herbert E., *Zeta* 1945
HERR, George A., *Mu* 1942
HOFFMAN, Victor F., *Alpha Theta* 1977
HOWARD, Eugene H., *Alpha Sigma* 1946
INSKEEP, George E., *Zeta* 1944
JAKLE, George L., *Alpha Epsilon* 1958
JONTE, J. Haworth, *Beta Beta* 1941
JUDKINS, Timothy C., *Beta Delta* 1963
KEBSCHULL, William D., *Alpha Phi* 1963
LAUGHLIN, William E., *Nu* 1947
O'BANNON, Charles Grant, *Epsilon* 1947
OLSON, Richard M., *Alpha Psi* 1944
OWENS, Kenneth E., *Beta* 1951
PAYNE, Kathryn E., *Beta Delta* 1973
PERCIVAL, Robert W., *Alpha Upsilon* 1950
RENICH, Paul W., *Kappa* 1943
SCHER, Marvin, *Pi* 1956
SIDERS, Ronald A., *Nu* 1957
SMITH, B. Frank, *Alpha Omega* 1946
STARR, Donald D., *Zeta* 1945
STRUVE, Gary E., *Sigma* 1968
THEBAUD, Jr., Reynal de St. Michel, *Chi* 1953
TULL, Cecil B., *Alpha Kappa* 1940
TUZINSKI, John R., *Beta* 1955
VASTINE, Frederick D., *Rho* 1963
WAGGONER, Raymond C., *Beta Delta* 1967
WAIBEL, Richard T., *Nu* 1963
WITHROW, Harold Jack, *Beta Delta* 1947
WYATT, James L., *Alpha Gamma* 1943

BOBO, Jr., Frank Eugene (Gene), *Beta Epsilon* 1943, passed away on April 4, 2012.

Bobo was born in Gray Court, SC, on July 21, 1917. In 1938, he graduated from Clemson University with dual degrees in chemical engineering and chemistry and a commission in the U.S. Army. After graduation, he accepted a management position with Gaybourn Mills in Gainesville, GA, and rose to the position of plant manager. With the onset of World War II, he was called to active duty in 1942. Initially assigned to the Chemical Warfare Service, he was selected for Command and General Staff School in Fort Leavenworth, Kan. As a captain in the U.S. Army, he served in the Southwestern Pacific in the 38th Infantry Division.

Bobo spent his professional life in the textile industry. Both in Gainesville, GA, and Charlotte, NC, Bobo was recognized and rewarded with numerous honors for his knowledge, leadership skills and commitment to excellence. His business career was spent with Chadbourn Hosiery Company in Gainesville and Charlotte. Bobo and colleagues Bill Leath, Robert M. Matthews and Claude Bagwell were jointly responsible for the invention and development of stretch nylon hosiery. They obtained at least seven U.S. patents from 1955 to 1963 for Chadbourn Hosiery. Bobo served as president of Chadbourn Industries up to his retirement in 1978. Later he joined with Peter J. Mallen to found a new textile venture, Mallen Industries, Inc. in Norcross, GA.

Bobo served as the chairman of the National Association of Hosiery Manufacturers and the president of the North Carolina Foundation for Support of Commerce and Industry.

In his community, Bobo served as president of the Gainesville Kiwanis Club in 1956. He also served on the boards of many organizations in Gainesville, including the Chamber of Commerce, American Red Cross, City of Gainesville Board of Education, Trustee of Gainesville College Foundation, Trustee of Mercer University and the Hall County Hospital Authority. As a member of the North Charlotte Rotary Club, he was recognized as Rotary Man of the Year in Mecklenburg County, NC

Bobo's true avocation was his affiliation with the Boy Scouts of America. After arriving in Gainesville following graduation from Clemson, he was approached to lead as Scoutmaster of Troop 26 of the Gainesville First Baptist Church. He accepted, and this led to a lifelong love and devotion to scouting. Bobo's service to the Boy Scouts of America includes Scoutmaster of Troop 26 from 1938 to 1956, Scoutmaster for the Northeast Georgia Council at the 1950 National Jamboree at Valley Forge, Pa., and Northeast Georgia Council Executive Board member and president. After moving to North Carolina, he served the Mecklenburg Council as district chairman, executive board member and Mecklenburg Council president. Following his return to

Gainesville in 1972, he continued his affiliation with the Northeast Georgia Council for the remainder of his life.

Because of his faithful service to the Boy Scouts of America, he was recognized by many awards including: Order of the Arrow, Scouters Key, Good Shepherd Award, Silver Beaver Distinguished Service Award, James E. West Foundation Award, Ernest Thompson Seton Award and Ralph Cleveland Distinguished Citizen Award.

BUSH, David G., *Beta* 1949, passed away on June 10, 2012.

Born in Westfield, MA, on April 21, 1922, Bush was valedictorian at Westfield High School and attended university before joining the Army. He was wounded in Luxembourg in 1945, receiving a Silver Star for gallantry in action.

He earned his bachelor's degree in chemistry at the University of Massachusetts and his master's degree in chemistry at the University of Minnesota before moving to Rochester, NY, where he worked for Eastman Kodak as a leader in research and industrial hygiene from 1952 until his retirement in 1984. He consulted in occupational health and environmental chemistry from 1984 through 2000.

Bush's wartime experience strengthened his deep searching faith. In addition to being a long-time member of Asbury Methodist Church, he co-founded Ekklesia and was active in House Church.

Bush's many community contributions included nine years as a member and president of the Penfield School Board and his many years as a member, councilor, secretary and chairman of the Rochester Section of the American Chemical Society. He also was an active member and president of the Rochester Chapter of Veterans of the Battle of the Bulge.

DIETSCH, Frederick F. (Fritz), *Alpha Upsilon* 1940, passed away on April 1, 2012.

He was born in East Grand Rapids, MI, on April 16, 1918, to parents Christian Fredrick and Helen Gage Dietsch.

Dietsch was a professional engineer with degrees in chemical and metallurgical engineering from Michigan State University. He served in the Metallurgical Department of the Bureau of Aeronautics, Department of the Navy, during WWII. After release from active duty as a lieutenant commander, he joined Reynolds Metals Company, retiring in 1981 as director of engineering and administration in the Metallurgical Research Division in Richmond, Va. While living in Richmond, he was a member of the Chesterfield County Electoral Board from 1964 to 1968. In 1968, he was elected to the Chesterfield County Board of Supervisors (the first Republican in his magisterial district since "reconstruction days") and served for four years.

IN MEMORIAM

He was a member of Redeemer Lutheran Church where he served the church in various capacities, including the first president of the Lutheran Action Council of Metropolitan Richmond. Other memberships included the Virginia Association of Professional Engineers, the Kentucky Association of Professional Engineers, the American Society for Testing Materials and the American Metals Society where he served as president of the local chapter. He was a founder of the Aluminum Abstract Journal published by the Aluminum Association and ASM. He was a member of the Society for the Preservation and Encouragement of Barbershop Quartet Singing in America where he served as chapter president, area counselor and vice president of the Mid-Atlantic District. Fritz received the Barber Shopper of the Year Award in 1966, the Award of Merit in 1970 and the Outstanding Service Award in 1980 from the Richmond Chapter.

Dietsch and his wife, Marjorie, moved from Littleton, NC, to Franklin, TN, in 1986 where he was a member of the Board of Management of the Brentwood Family YMCA from 1989 to 1994. He was presented with the Volunteer of the Year Award in 1992. He also taught 55 Alive/Mature Driving for AARP for 10 years. Fritz was previously a member of Our Savior Lutheran Church in Nashville then transferred to St. Andrew Lutheran Church in Franklin. As a member of St. Andrew, he served as an adult Sunday school teacher, was a member of the men's group "The Navigators" and was involved in senior activities. Dietsch shared his lifelong love of music through his participation in the adult choir.

HOWARD, Eugene (Gene), *Alpha Sigma 1946*, passed away on April 23, 2012.

He was born on March 9, 1924, in Stilwell, OK, and made his home in Muskogee, OK. At the University of Arkansas, he majored in chemical engineering.

He was a member of the R.O.T.C. and enlisted in the Army Reserve. World War II interrupted his education when he was called to active duty. While fighting in Luxembourg, Howard was wounded and received the Purple Heart. He was awarded the Bronze Star for seeking medical aid for other wounded soldiers in his unit before he sought treatment for himself. Like other members of the Greatest Generation which journalist Tom Brokaw describes in his book, Howard fought in the war, came home, attended college under the G.I. bill and then pursued his career without looking back or complaining.

After the war, he completed his chemical engineering degree at the University of Arkansas and was initiated into Alpha Chi Sigma. Howard took a job as a research engineer with Aluminum Company of America (ALCOA). His research led to publications in the Journal of the American Chemical Society. While working at ALCOA,

Howard continued his education at Carnegie Tech in Pittsburgh, where he pursued a degree in industrial management. In 1959, he moved his family, which by then included daughters, Beverly and Cyndy, to Corpus Christi, Texas. During his tenure at Reynolds Metals, he worked as a plant industrial engineer and plant engineer. Howard pioneered the use of computers in aluminum production, introducing automation on the potline.

Howard also worked with Reynolds International on special projects, which required several trips to Venezuela. One extended project resulted in his writing a manual that described the operations and cost accounting for the operation of a pre-bake aluminum potline. The manual was translated into Spanish and later into Portuguese for use in Brazil. Other professional activities included qualifying as a registered professional engineer in Texas, later achieving Life Member Status in the National Society. He served as president of the Nueces Chapter of Professional Engineers.

In addition to a full professional life, he was active in the community and church. He belonged to the Portland Rotary Club, later transferring to the Southside Rotary Club of Corpus Christi. He served two terms as president of the Portland Rotary Club, which honored him by making him a Paul Harris Fellow. He served a term as president of the Friends of the Library. Gene enjoyed working in the television ministry at First Baptist Church for 19 years running cameras, monitoring the sound system and producing the entire program. He was an active deacon for many years until declining health prevented his participation.

HERR, George A., *Mu 1942*, passed away on May 23, 2012.

He was born in Boston, MA on Nov. 30, 1921. Following the death of his father, the family moved to Keene, NH. Herr graduated from Keene High School in 1939 and the University of New Hampshire in 1944 with a bachelor's degree in Chemistry. He also earned a Master's degree in chemistry from the University of New Hampshire.

Herr served in the U.S. Army in World War II in the Second Lieutenants Infantry and assisted in the liberation and restoration of the Dacow Concentration Camp.

Herr began working for Eli Lilly and Company in 1947. He worked in the Indianapolis plant for 20 years in chemical engineering. In 1967, he moved to the Lafayette plant and retired as the director of environmental control in 1985, after 38 years of service.

Herr was a member of Congress Street United Methodist Church, where he was church treasurer, trustee and a member of the Administrative Council. He was also a member of Alpha Chi Sigma, American Chemical

Association, Lafayette Country Club, John Purdue Club, Noon Kiwanis Club and First United Methodist Church in Punta Gorda, FL. He was an avid golfer and a huge sports fan, especially of Purdue University and the Chicago Cubs. Herr was passionate about building beautiful, intricate model ships.

PAYNE, Kathryn E. (Ogden), *Beta Delta 1973*, passed away Dec. 10, 2011. She traveled with her naval officer husband and returned to school when he retired in 1983. She earned a master's degree in computer science and a bachelor's degree in English from Corpus Christi State University. She worked as a technical writer for Amdahl and Nuance Corp. and was a lifelong student.

TULL, Cecil B., *Alpha Kappa 1940*, passed away on June 12, 2012.

He was born on the family farm west of Seaford, DE, on Oct. 9, 1920. Following his graduation from Seaford High School in 1938, Tull received a bachelor's degree with honors in chemical engineering from the University of Virginia and subsequently pursued graduate studies at the University of Delaware. Tull was a naval veteran of World War II and served with the Seabees in South East Asia and the Pacific theater.

Following his return to civilian life, he joined the family business, Sussex Farms and Tull Brothers Inc., and was instrumental in their establishment of an International Harvester/Case dealership for agriculture equipment. He served as chief executive officer and vice president as the family of businesses expanded into hardware, house wares, gift and garden retail operations. Under his leadership, the equipment dealership was recognized numerous times for outstanding sales and service to the agriculture community.

Tull served on the Seaford School Board and was a life time member of the VFW, American Legion, Moose and Elks Lodge, the University of Virginia Alumni Association and Alpha Chi Sigma Fraternity.

WAGGONER, Raymond C., *Beta Delta 1967*, passed away on Jan. 30, 2012.

He retired from the Missouri University of Science and Technology in 1992 and was professor emeritus of chemical engineering.

Dr. Waggoner attended Principia High School in St. Louis and then earned a degree in chemical engineering at the University of Louisville. He served in Korea with the U.S. Air Force. He later worked for Dow Chemical and finished his graduate work at Texas A&M before moving to Rolla.

100 years ago... Fall 1912

An expansion opportunity opened at the University of California-Berkeley. In 1902, at the same time Alpha Chi Sigma was founded at Wisconsin, a semi-honorary chemical fraternity known as Mim Kaph Mim was established at Berkeley. In 1908, Geology Professor, G. H. Cox, an *Alpha* Chapter initiate, attempted to broker a merger of Mim Kaph Mim with Alpha Chi Sigma. After several months of serious correspondence, Mim Kaph Mim rejected the offer. In September 1912, the fraternity got a letter from H. W. Nohle, a chemistry student at Berkeley, saying that sixteen chemistry students had banded for the purpose of securing a chapter of Alpha Chi Sigma and that their project had the support of various members of the chemistry department. There had been considerable dissatisfaction on the part of the chemistry students over Mim Kaph Mim. Control of the organization had been captured by a group of mining engineering students and only one chemistry major was invited to join in the fall of 1912. Alpha Chi Sigma was quick to jump in to fill the void and began working with Mr. Nohle to prepare a petition.

In addition to the petition from Berkeley, the National Office received petitions from groups at Cornell and Northwestern. At Allegheny College, the Scientific Club was too broad-based to satisfy the Chemistry Department, so Department chair Edwin Lee, who also happened to be an *Alpha* Chapter alumnus, talked with GMA Matthews about starting an Alpha Chi Sigma chapter. There was also considerable correspondence with groups at Yale, Stanford and the University Michigan.

Delta Chapter, at the University of MO-Columbia, moved into their new chapter house at 1001 Locust Street.

75 years ago... Fall 1937

Eighty Brothers and guests attend the *Sigma* Chapter picnic at Mt. Diablo Country Club. The next weekend *Sigma* held their semi-formal dance. In order to make the dance a little less awkward, a dance instructor was hired to give lessons during the hour before the dance.

During the Fall meeting of the American Chemical Society, the Rochester Professional Chapter organized the traditional Alpha Chi Sigma Banquet. Over 206 Brothers enjoyed dinner of roast duckling, creamed spinach and parsley potatoes, a meal that was topped off with cherry tart a la mode. A number of speakers addressed the group and at the end, several door prizes were awarded.

The Washington Professional Chapter held their October meeting at the home of Brother Klare Markley. A brief business meeting was followed with the customary beer and oysters.



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

The meeting was very well attended, yet notably absent from the meeting was Brother Markley who had been recently transferred to the Bureau of Chemistry and Soils in Urbana, Illinois. Among the several visitors who did attend, newly appointed Southern District Counselor Clyde Hutchison was there, showing home movies taken at the 1936 Conclave.

The September meeting of the Cincinnati Professional Chapter was held on a houseboat on the Ohio River.

The Atlanta Professional Group held a joint meeting with *Alpha Omega* Chapter at the Tavern Tea Room. Guest speaker for the evening was A. Watson Chapman.

50 years ago... Fall 1962

Rho Chapter at North Carolina renovated their chapter room by disposing of all the old furniture, giving the walls a fresh coat of paint, and bringing in a pool table. To complete the renovations, the chapter added a new FM radio.

Beta Mu Chapter at Occidental College conducted a slide rule fundamentals class and safety demonstration for the students taking general chemistry.

John C. Bailar, *Eta*, was presented with the John R. Kuebler Award during a special banquet at the Fall meeting of the American Chemical Society in Atlantic City, NJ. Sid Kirkpatrick served as emcee for the dinner. Biographical information on Brother Bailar was presented by Brother Stanley Kirschner, and the award was presented by GMA Marvin Schneller.

25 years ago... Fall 1987

After nearly ten years of inactivity, the Chicago Professional Chapter was reactivated. Robert Pettiti (*Beta Nu*) was elected president, Robin Robinett (*Delta*) was elected vice-presi-

dent and Christine Beauchamp (*Beta Nu*) was elected secretary. The group's first outing was a picnic followed by a Gilbert & Sullivan play.

In a rare off-Conclave vote, the Grand Chapter approved a bylaws change affecting the Professional Representatives. The bylaws change gave the GMA a mechanism to appoint replacement PRs whenever vacancies occurred.

John Perry of *Xi* Chapter (Yale) was elected to the Alpha Chi Sigma Hall of Fame.

After extensive debate and discussion, the Supreme Council agreed to continue sponsoring a fraternity leadership program. The revised Laboratory for Leadership program, developed by Don Coyne, Bennie Good and Maurice Bursery, was presented in Columbia, MO. About 20 Brothers from four chapters attended. All in attendance thought the program was very useful and particularly liked the computerized planning process.

At the suggestion of GPA Paul Jones, GMC Mitch Levings designed jewels of office for each of the Supreme Council Officers and Grand Recorder. The Council approved the jewels for use, but declined to spend the funds to fabricate them.

The Supreme Council voted unanimously to adopt an 8-point drug and alcohol policy. The GMC also issued a revised statement on hazing.

Winners in the Professional Representative election were Arden Dougan (*Beta Nu*), Pete Yochim (*Nu*), Don Green (*Sigma*) and Don Coyne (*Kappa*).

10 years ago... Fall 2002

Eighty-three Brothers attended the seventh annual North Central District Conclave held in the national headquarters building in Indianapolis. The day was filled with presentations from Mike Vopatek, Jen Fairgrieve (Showerman), NCDC John Stipp, Brendan Mayhugh, Matt Erley, Frank Omana, Wade Jarrell, Indianapolis Professional President Christy Gesell, Robin Fishbein and Jeremy Gallian. The entire Supreme Council was also in attendance, and while the NCDC Stipp held a forum for chapter MAs, the other attendees got to hold a Q&A session with the Council.

The Supreme Council gave *Zeta* Chapter permission to pledge and initiate students from Southern Illinois-Carbondale in order to re-establish *Beta Psi*. They also authorized *Nu* Chapter to pledge and initiate qualified students from Indiana University of Pennsylvania in order to establish a chapter there.

Dr. Alexander Scheeline took on the role of Chapter Advisor to *Zeta* Chapter while Dr. Thomas Frey and Dr. Rodney Schoonover joined forces to become Chapter co-Advisors to *Gamma Zeta* Chapter. ☺



Fresh to you each morning!

The newly retired professor, a synthetic organic chemist of some renown, calls his former Department Chair and says, "Could you stop over after work? I have a killer jigsaw puzzle, and I actually can't figure out how to get started."

The Chair says, "Haha! It's great that you are keeping your mind active. What is it supposed to be when it's finished?"

The professor says, "According to the picture on the box, it's a rooster."

His former Chair stops by, after work, to check in and help with the puzzle. The professor lets him in and shows him where he has the puzzle spread all over the table.

The Chair studies the pieces for a moment, then looks at the box, then turns to his colleague and says, "First of all, no matter what we do, we're not going to be able to assemble these pieces into anything resembling a rooster."

He sits the professor down and says, "Secondly, I want you to relax. Let's have a nice cup of tea, and then," he says with a deep sigh "Let's put all the Corn Flakes back in the box."

The answers to these next three puzzles can be found on page ?? Below??

Elementary

What five letter chemical element is represented by this list?

SILICON HELIUM NEON HYDROGEN LEAD OXYGEN

Colorimetry

At the ACS SciMix, three colleagues gather by the punch bowl. They called themselves the Metal Band, because their names are Professor Gold, Professor Silver, and Professor Bronze. As it turns out, they were wearing blazers in these same three colors: gold, silver, and bronze.

The professor in the silver blazer looks around and exclaims, "Say. I just noticed... none of us is wearing a blazer whose color matches our name."

Professor Gold replies to her: "Wow. You are exactly right!"

What color blazer is each professor wearing?

Seating Chart

Lisa and Tom are two first-year graduate students who joined the same research group. They get on well, but have one strange quirk. At the weekly group meeting, Lisa insists on sitting behind Tom, and Tom insists on sitting behind Lisa. How did the professor resolve this situation to be resolved such that both of them are happy?

COLLEGIATE AND PROFESSIONAL NEWS

(continued from page 57)

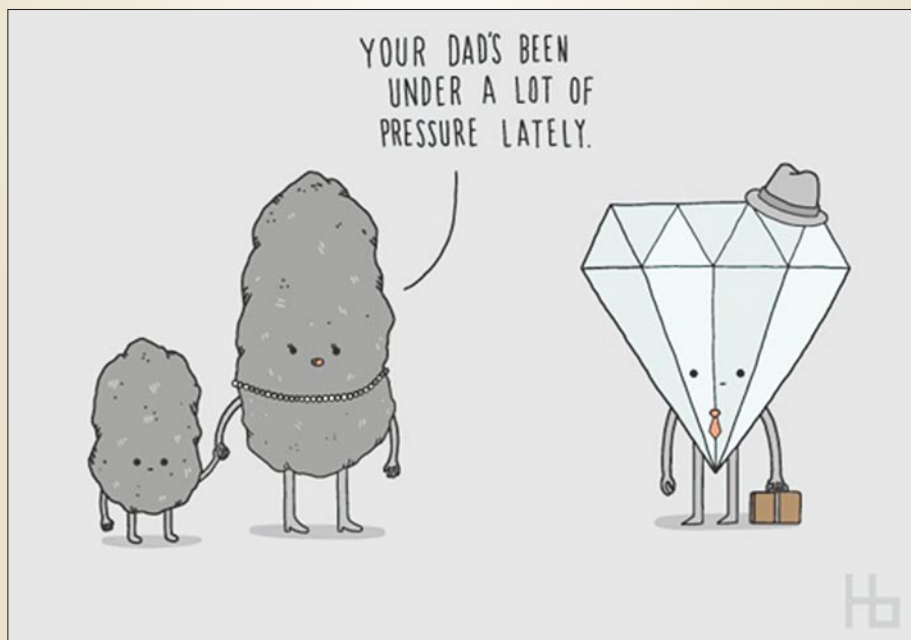
tion within the student body. As well, it gave students the opportunity to gain practical experience in planning and organizing in an event setting, teamwork by working within their own group and communication with others, and developing tolerance of ambiguity, which are all skills targeted by the student development outcomes designated by the University of Minnesota to help their students grow as individuals.

The day of the event began with a large group demonstration put on by one of the faculty members of the Chemistry department of the University. By putting on this show, it showcased large-scale explosive demos such as blowing up hydrogen balloons and screaming gummy bears and allowed the Boy Scouts and parents to get excited for the remaining activities for the day. All of the scouts then broke out to their designated badge rooms for lessons filled with hands on science and exploration. Specifically, in the Chemistry merit badge room, the boys were taken through the basics of lab safety, different disciplines of chemistry, and current issues by means of a power point presentation, demonstrations, discussions, and meeting a professor. To finish out the session, polymers were briefly covered in addition to the requirements, and the boys were given the chance to make silly putty. By giving the boys a chance to feel chemistry take place, it gave them an excitement that couldn't be replicated.

Beta Chapter brothers led the chemistry merit badge room, as we do every year. We were able to interact with the boy scouts through both larger demonstrations of chemical principles, as well as breaking up into smaller groups to talk about the environment. The Scouts were also able to interact with Dr. Ken Leopold, who was initiated into Alpha Chi Sigma in the spring of 2011. They were able to ask him questions about being a professor and about the research that he does.

The merit badges offered consisted of chemistry, nuclear science, engineering, robotics, composite materials, and energy. This is the largest number of merit badges that we have offered at one of our Boy Scout events, with various College of Science and Engineering student groups leading a merit badge.

Overall, the Boy Scout Merit Badges day was extremely successful and provided a platform that can easily be expanded upon.





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ALPHA*-University of Wisconsin
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BETA*-University of Minnesota
Minneapolis, MN

GAMMA-Case Western Reserve University
Cleveland, OH

DELTA-University of Missouri
Columbia, MO

EPSILON-Indiana University
Bloomington, IN

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

SIGMA*-University of California-Berkeley
Berkeley, CA

TAU*-Cornell University
Ithaca, NY

ALPHA BETA*-University of Michigan
Ann Arbor, MI

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

ALPHA RHO-University of Maryland
College Park, MD

ALPHA SIGMA-University of Arkansas
Fayetteville, AR

ALPHA UPSILON-Michigan State University
East Lansing, MI

ALPHA OMEGA-Georgia Institute of Technology
Atlanta, GA

BETA GAMMA-University of California-LA
Los Angeles, CA

BETA DELTA-Missouri Univ. of Science & Technology
Rolla, MO

BETA ETA-University of North Texas
Denton, TX

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 Technology
Rochester, NY

BETA TAU-University of Arizona
Tucson, AZ

BETA PHI-South Dakota School of Mines & Tech
Rapid City, SD

BETA CHI*-Hampden-Sydney College
Hampden-Sydney, VA

BETA PSI-Southern Illinois University
Carbondale, IL

GAMMA BETA-Florida State University
Tallahassee, FL

GAMMA DELTA-The College of Charleston
Charleston, SC

GAMMA ZETA-California Polytechnic St Univ
San Luis Obispo, CA

GAMMA ETA-Marshall University
Huntington, WV

GAMMA THETA-Truman State University
Kirksville, MO

GAMMA IOTA-Virginia Polytechnic
Blacksburg, VA

GAMMA KAPPA-James Madison University
Harrisonburg, VA

GAMMA NU-Ohio University
Athens, OH

GAMMA XI-North Carolina State University
Raleigh, NC

GAMMA OMICRON-Lehigh University
Bethlehem, PA

GAMMA TAU-Indiana University of Pennsylvania
Indiana, PA

GAMMA UPSILON-Duquesne University
Pittsburgh, PA

GAMMA PHI-University of Buffalo
Buffalo, NY

GAMMA CHI-Longwood University
Farmville, VA

GAMMA PSI-University of Toledo
Toledo, OH

GAMMA OMEGA-Widener University
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