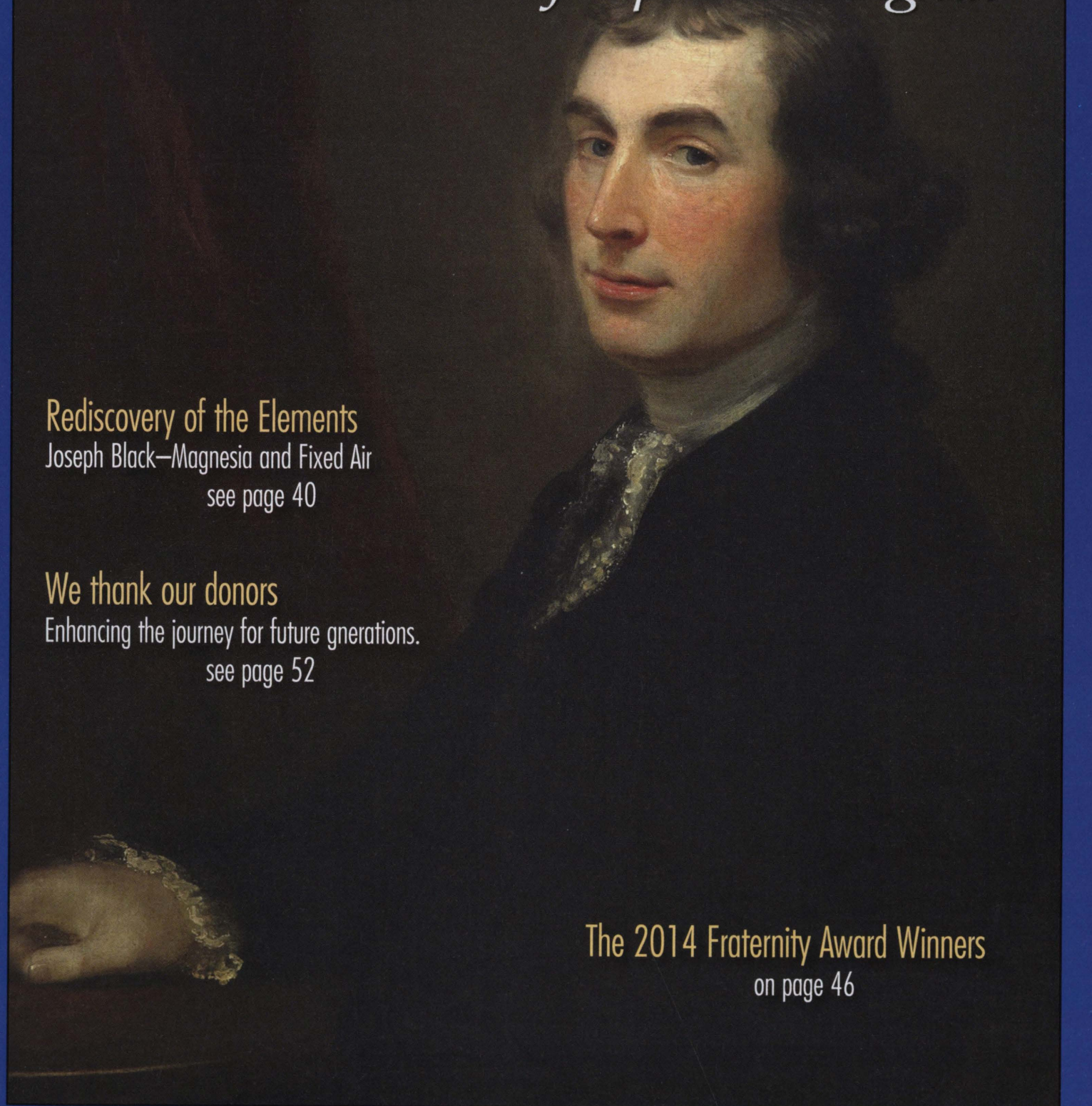
THE HEXAGON

FALL 2014

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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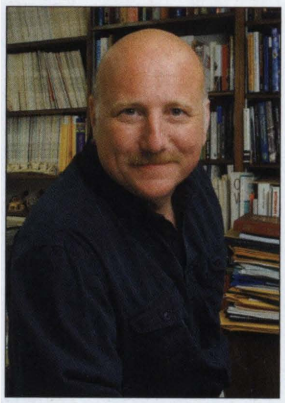
EDITORIAL

Time Passages



Brian P. Coppola, GE
Alpha Beta 1988

As I assemble *THE HEXAGON*, I regularly look forward to reading Grand Historian Mitch Levings's "Looking Back" column, which is always the last article before the "Hot Retorts" appear on the inside back cover. In each installment, you get a lovely set of snapshots of the things that were going on at the time: why did *Tau* Chapter hold a smoker 100 years ago? What was the originally requested toll-free number for Alpha Chi Sigma? And so on.

Try to connect, when you can, with your history. It is a way we appreciate and measure the passage of time.

I started college at the University of New Hampshire in 1974, so it got me to thinking about 40 years ago as a round number anniversary.

In 1974, Charles de Gaulle airport opened in Paris, France; the terracotta army of Qin Shi Huang was discovered in Xian, China; Stephen King published his first novel, *Carrie*; and the Swedish pop group ABBA won the Eurovision Song Contest with *Waterloo*.

"Try to connect, when you can, with your history."

In 1974, the first scan of a UPC (universal product code) was carried out—it was a stick of Wrigley's chewing gum at a store in Ohio; U.S. President Richard M. Nixon resigned; the Rubik's Cube was invented; Dungeons & Dragons was released; future musicians Jewel, Alanis Morissette, and CeeLo Green were born, as were future performers Leonardo DiCaprio, Hillary Swank, and Joaquin Phoenix.

In 1974, Paul Flory won the Nobel Prize in Chemistry for his contribution to the fundamental understanding of the physical chemistry of macromolecules. Flory was initiated into the *Tau* Chapter of Alpha Chi Sigma in 1949, 35 years after that smoker I mentioned earlier, and 53 years before he was posthumously inducted into our Hall of Fame.

Yours in the double bond.

On the Cover

This portrait of a young Joseph Black (1728–1799) by David Martin (1737–1798) is dated tentatively 1770, although it is probably earlier. A vibrant part of the Scottish Enlightenment, Black's pioneering research anticipated Lavoisier's New Chemistry by being the first to dispel an imaginary principle (causticum), replacing it with a real principle (carbon dioxide)—34 years before Lavoisier's *Traité de chimie* with its anti-phlogiston thesis. Portrait, used with permission, courtesy of The University of Edinburgh Art Collection.

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

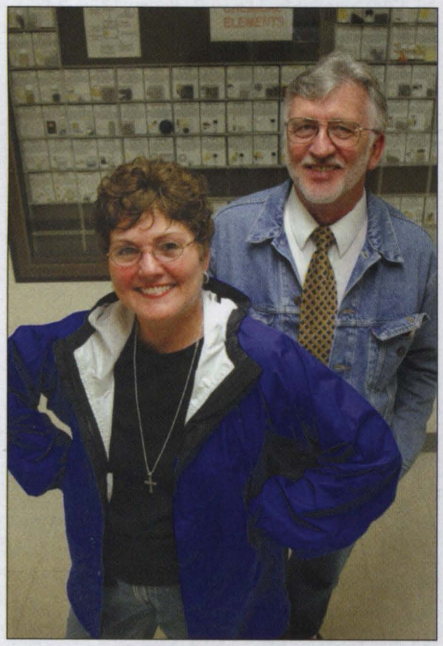
1. To bind its members with a tie of true and lasting friendship.
2. To strive for the advancement of chemistry both as a science and as a profession.
3. To aid its members by every honorable means in the attainment of their ambitions as chemists throughout their mortal lives.

ASMA, Jr., Benjamin R., *Alpha Pi 2013*
COMBS, George Donald, *Alpha Sigma 1957*
MARSHALL, Virginia "Jenny" Louise, *Beta Eta 2003*
OLIVER, Gene L., *Upsilon 1951*
UMBREIT, Gerry C., *Alpha Alpha 1943*

Benjamin Richard **ASMA**, Jr., *Alpha Pi 2013*, passed away April 2, 2014. He was a 2013 graduate of Lake Forest High School (LFHS) in Lake Forest, Illinois, and was attending George Washington University where he was majoring in biomedical engineering and pre-medicine. At LFHS, he was an outstanding student with a passion for math, science, swimming and music, participating in jazz band, wind ensemble, pep band and orchestra.

George Donald **COMBS**, *Alpha Sigma 1957*, passed away June 9, 2014. He was the first person to earn a doctorate degree in engineering from the University of Arkansas. He taught at the University of Arkansas, worked for Exxon and helped found ENSCO, an environmental company that was the first company in the United States licensed to incinerate PCBs.

Gene L. **OLIVER**, *Upsilon 1951*, passed away March 13, 2014. Oliver was born in Rockford, Illinois. He graduated from Beloit College with a bachelor's degree and graduated from Northwestern University with a doctorate degree in organic chemistry. He worked for Kodak in the research labs from 1954 until he retired in 1989. Oliver was an active member of the First Unitarian Church of Rochester, New York, for more than 40 years, was an active member in the local American Chemical Society and loved his time at the family cottage on Keuka Lake.



Jenny and Jim Marshall have authored more than 45 articles in the Rediscovery series since it first appeared in the Fall 2000 issue of The HEXAGON.

Jenny Marshall, 1945–2014, working in the office that houses the "Rediscovery of the Elements" series.

Virginia "Jenny" Louise Marshall, *Beta Eta 2003*

Virginia (Jenny) Louise Marshall neé Rankin, 68 years, passed away on September 8, 2014, suffering from a heart attack of four days earlier. She was born in Wichita Falls on November 20, 1945. Her father, James Leon Rankin, was a multi-talented Texan who was a teacher, preacher, cow puncher, horse breaker, and oilman; and her artistic mother, Lucile neé Barton, a homemaker, restaurant manager, and a nurse. Virginia gained her secondary school education in various schools across Texas as her father traveled about; they eventually settled in Big Spring where she gained her high school education, graduating in 1963. From Texas Woman's University she gained a B.S. *magna cum laude* in 1980 and an M.Ed. with specialty in computer science in 1983. She was a Mortar Board member, Pi Sigma Alpha, 1980. She taught at Jefferson Davis School in Denton, Texas, 1980–1985, and then Calhoun Junior High and Middle School in Denton 1986–2003, where she taught computer classes and photography.

She married Dr. James L. Marshall, *Beta Eta 1971*, professor of chemistry at the University of North Texas, in 1998, and the pair had been active ever since as a team in the international "Rediscovery of the Chemical Elements" project covering over 20 countries which has culminated in more than 60 publications, a 15-year span of American Chemical Society lecture tours, and a DVD used in classrooms across the country. Although not a chemist by training, Jenny was inducted into *Beta Eta* Chapter in 2003 due to her amazing work in the history of the chemical elements.

Jenny was also an accomplished artist and craftswoman, making beautiful jewelry, sewing lovely clothes, and knitting comfy outwear. Virginia was a member of Delta Kappa Gamma International and was initiated as a proud member of the Daughters of the Republic of Texas in 2013.

Virginia is survived by two sons, Robert Edgar Lumpkin, 45 years, San Diego, California, and James Everett Lumpkin, 40 years, Austin, Texas, who with Ashley Brook neé Bailey has three children: Kinsley (8), Evangeline (Evie, 3), and Anderson (2); by nephews John David Harris (51) of Austin, Texas, and Michael Raymond Harris (53); by a niece Mary Louis Taylor Buller (38) of Spring, Texas; and by a sister Annie Margaret Warner (74) of Durham, North Carolina; and by her husband James (Jim) Marshall.

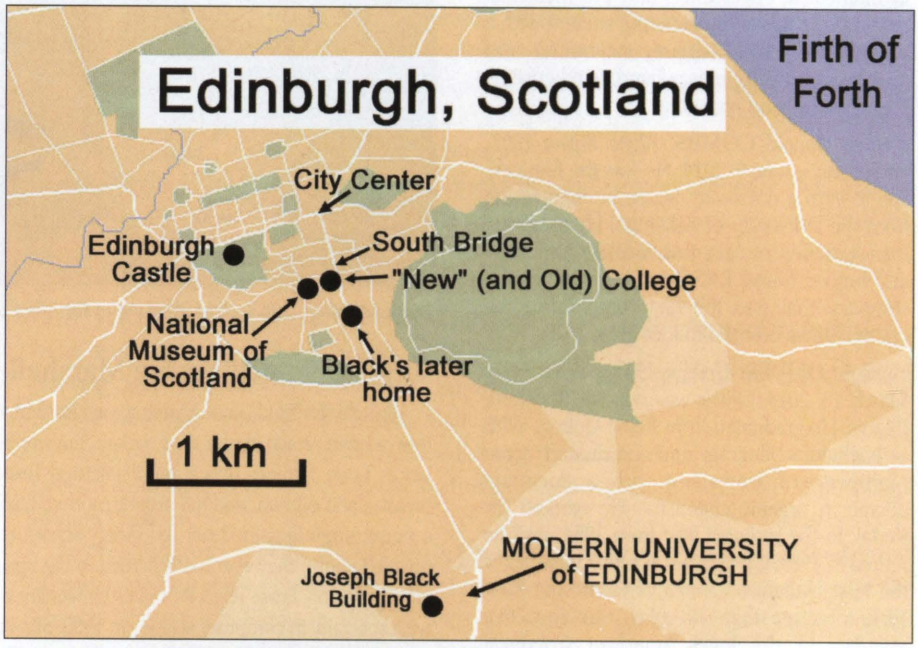
Full of brilliance and visionary goals, Jenny was an impressive harmony of beauty and professionalism. With a winning smile and a gracious heart, Virginia was loved by all, winning over the hearts of everyone she met. Jenny was an amazing person, always so cheerful and upbeat, and enthusiastic about everything she did. She had an adventurous spirit and was always willing to try new things—from learning how to co-pilot a private plane, to hiking the Grand Canyon, to traveling the world in the name of scientific research. Jenny met every challenge with her amazing spirit and dynamo attitude. She was quick with a joke and a laugh and made those around her feel special and loved. Her positive perspective, enthusiasm, and love of learning will always serve as a role model for others.

Memorials to her non-profit scholarship program may be made to James L. Marshall, 120 Cobblestone Row, Denton, Texas 76207 (Comment line: Marshall Education Fund).

Rediscovery of the Elements

Joseph Black–Magnesia and Fixed Air

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



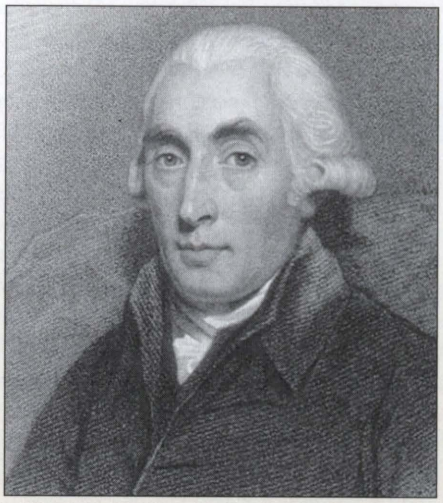


Figure 1. (Left) Engraving of Joseph Black, made in 1800 by James Heath (1757–1834), taken from a ca 1790 portrait by Henry Raeburn (1756–1823). Raeburn was a student of David Martin, whose portrait of young Joseph Black is shown on the front cover.

Figure 2. Modern map of Edinburgh. The chemical discoveries of Black were performed at the Edinburgh "Old College," whose buildings were taken down and replaced by the "New College" during 1827–1831. The Royal Museum of Scotland is located 200 meters west, where exhibits on Black are presented (see Figure 8). The modern campus is 2.7 km south of the "New College." During his last 18 years, Black lived on Nicholson Street, a continuation of South Bridge.

Joseph Black (1728–1799) (Figure 1) is perhaps best known for the discovery and characterization of carbon dioxide (fixed air), made during his research with alkalies and carbonates. Simultaneously, he made the first chemical distinction between calcia (CaO) and magnesia (MgO) and thus could be credited with the discovery of magnesium. This research was performed at the University of Edinburgh, Scotland (Figure 2).[1b]

Black is also known for his pioneering research in latent heat at the University of Glasgow, where he was the first to notice that the temperature of an ice-water mixture does not rise above the freezing point of water until all of the ice has melted (Figure 3).[1d]

Joseph Black's career.[1b,d,2] Joseph Black's family was of Scottish origin. His father was born in Belfast but migrated to Bordeaux, France, where he set up a wine business. The son Joseph returned to the British Isles and studied four years (1746–1750) in Glasgow with William Cullen (1710–1790). Black then matriculated at the University of Edinburgh (1750–1754), where he earned his medical degree with Charles Alston (1683–1760), the Chair of Botany and a specialist of *materia medica* (medicinal drugs). Black then returned to Glasgow in 1756 to become professor of anatomy and lecturer in chemistry, replacing Cullen who had taken a position at the University of Edinburgh; Cullen became one of the distinguished professors at Edinburgh who helped it become one of the leading medical schools in Europe. Then in 1766 Black returned to the University of Edinburgh as professor of chemistry, replacing Cullen who had been promoted to Professor of the Institutes of Medicine. Black remained at Edinburgh the remainder of his life (Figures 4, 5).

Black's scientific reputation was widespread throughout Europe and America, and he was visited frequently by those who sought expertise and guidance from the master (Figures 6, 7). Smithson Tennant (1761–1815; the discoverer of iridium and osmium[3e]) studied with Black in 1781. When the Polish scientist Jedrzej Sniadecki (1768–1838; the discoverer of

Figure 3. This plaque resides on the Joseph Black Building (Chemistry Building) of the modern University of Glasgow (N55° 52.32 W04° 17.57). Black's main contribution in Glasgow was his work in latent heat[1d] in 1761. Black preferred to do research in the winter, when ice was available for his calorimetry and latent heat studies. His ideas on the latent heat of steam gave James Watt the inspiration and technology to develop steam power. In his day the campus was on High Street, 3.5 km east of the present campus; the buildings now are completely gone.

Figure 4. Both Glasgow and Edinburgh claim Joseph Black. This is the Joseph Black Building (Chemistry Building) in Edinburgh (N55° 55.44 W03° 10.58) at the present-day south campus, occupied in 1924.

"vestium,"[3f] traveled to Western Europe to further his education, he was prevented from visiting Antoine Lavoisier (1743–1794) because of the French Revolution; as an obvious alternative he turned to Black in Edinburgh.[4] Benjamin Rush, a co-signer of the Declaration of Independence, had earned his medical degree at the University of Edinburgh; he returned to Philadelphia in 1769 and presented courses at the College of Philadelphia (today the University of Pennsylvania) based on Joseph Black's very popular lectures.[5]

Caustic and mild alkalies as medicines. As a student at Edinburgh, Joseph Black became intrigued with alkalies, a research interest of his advisor Charles Alston. In the 1700s, alkalies were known to include the groups of vegetable (potash), marine (soda), volatile (ammonia), and calcareous (lime). Each of these alkalies could appear in "mild" (carbonate) and "caustic" (hydroxide) forms.[1b, 6] The compositions of each were unknown, but today we know these as:

Alkali	Mild form	Caustic form
Potash	K_2CO_3	KOH
Soda	Na_2CO_3	NaOH
Ammonia	$(NH_4)_2CO_3$	NH_4OH or NH_3
Calcia	$CaCO_3$	CaO or $Ca(OH)_2$

It was believed that alkalies might be solvents for "urinary calculi" (kidney stones), but the caustic forms were too acrid to be useful medicinal remedies—when caustic alkali was applied to a dog's bladder in an attempt to dissolve the stones, instead they "dissolved the bladder."[7] Hence, the mild forms were prescribed for humans, such as ordinary chalk ($CaCO_3$). It was soon recognized that chalk might also be a useful remedy for stomach maladies because it relieved indigestion. (Today, the antacid $CaCO_3$ is available as "Tums.")

Theory of caustic and mild alkalies. The technology of heating limestone (mild calcia) to produce mortar (quicklime, caustic calcia) has been known for millennia.[8a] It was believed by Medieval chemists[9b] that causticity was induced by a "quantity of pure fire" that had been imparted to the limestone.[1a] By the 1700s a sophisticated theory had been developed by Johann Friedrich Meyer (1705–1765), a German apothecary in Osnabrück (located between Cologne and Hamburg).[1c] Adopting an idea from *terra pinguis*, the "fatty earth" which was the principle of combustibility and the forerunner of "phlogiston,"[9c] Meyer invoked an *acidum pinque* ("fatty acid"), a fiery principle which saturated mild alkalies to produce caustic alkalies. For example,

Chalk ($CaCO_3$) + "acidum pinque" → caustic lime (CaO, slaked lime)

The slippery feeling of a caustic alkali (such as sodium hydroxide, today's lye or "Drano") was explained by the saturation with this oily substance. Shortly afterward, this principle "acidum pinque" was given the more descriptive label of *causticum*.[10]

According to this theory of *causticum*, one could distinguish a mild alkali (such as sodium carbonate or calcium carbonate) from a caustic alkali (such as sodium hydroxide or calcium hydroxide) by adding acid. In this diagnostic test, mild alkalies would effervesce by absorption of causticum, while the caustic alkalies, already saturated with acidum pinque, did not effervesce. This effervescence was understood merely to be, in the parlance of the times, a "symptom of the violent movements caused by mutual saturation of acid and alkali."[10] Today, this effervescence is known to be generation of carbon dioxide and is the standard geologist field test for limestone ($CaCO_3$ + acid → CO_2).

However, there were gravimetric difficulties with this idea: when limestone calcined to form quicklime, it supposedly received causticum from the fire, but it *lost* weight. This loss of weight was known since the ancient Romans—but the significance was not recognized because it was considered to be a simple "loss of water."[8a]

Figure 5. A few sketches survive of the Old College in Edinburgh. This sketch[12b] was made in 1789, and is "Principal Robertson's house" (left) and the "Teviot chambers" (right, used for classrooms and residences). These can be identified as the southernmost buildings of the Old College Quadrangle (see Figure 6).

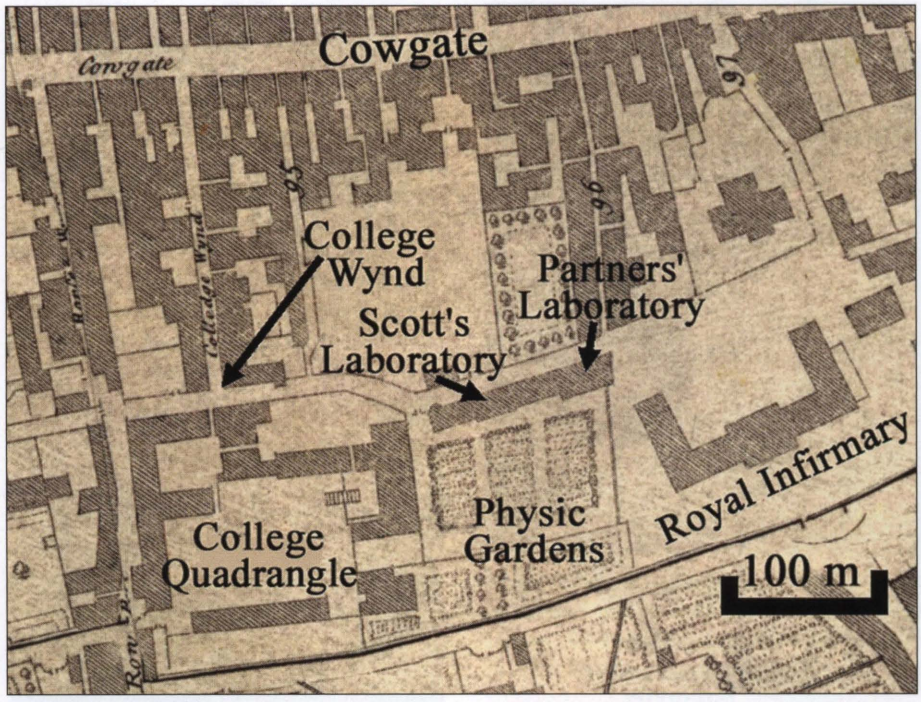


Figure 6. Edgar's 1765 map of the Edinburgh Old College area.[17,20] The College Quadrangle is the main campus of Old College. The "Physic [Medical] Gardens" grew medicinal herbs for patients in the Royal Infirmary. Black probably performed his magnesia research in the Infirmary.[15b,16] College Wynd [wynd = narrow alley] was the main entrance to the campus (see Figure 7). There was no easy access to City Center of Edinburgh; one had to cross Cowgate, essentially a ravine. South Bridge (see Figure 2), the south-north road linking with central Edinburgh, was built in 1788, passing directly through the Physic Gardens.

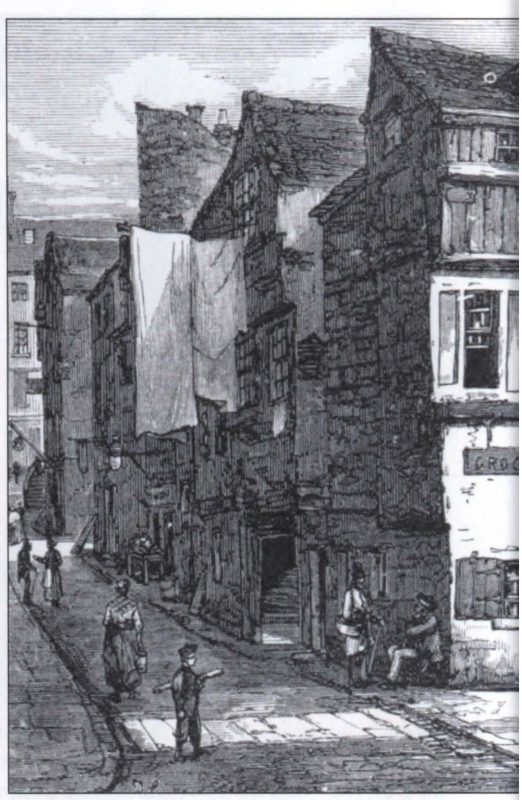


Figure 7. Black's earlier days were spent in College Wynd, a ramshackle district at the north entrance of the Old College. A "wynd" (rhymes with "find") is a narrow alley in Scotland. Nearby was the residence of the Scott family (where Sir Walter Scott was born in 1771),[21a] now marked with a plaque mounted high on a corner building (N55° 56.87 W03° 11.25). (Drawing by William Channing[21a].)

Black's research with carbonates. Black's work, presented in his medical dissertation at the University of Edinburgh,[11] has been described as "a brilliant model, perhaps the first successful model, of a quantitative chemical investigation, as well as a classical exemplar of an experimental science worthy of comparison with Newton's *Opticks*."[2a] Black's early notes[7] from 1751 show that first he had tested the idea that the fire imparted causticum to the chalk ($CaCO_3$) to produce the quicklime (CaO). Since quicklime becomes mild upon exposure to the air, then obviously the quicklime was supposedly losing this causticum to the atmosphere. Perhaps, he thought, one could catch this elusive principle in a bottle.[2b] Black set up an experiment whereby a dish filled with caustic lime (CaO) was allowed to float in water with an inverted glass vessel over it.[2a] Hoping this igneous matter might be collected, instead he observed that the air space above the quicklime, if anything, had been *reduced* in volume, making him suspicious that something had *removed* from the atmosphere. The fact that the quicklime had simultaneously increased in weight while converting to the mild form supported this idea.

Then Black measured the loss of weight of chalk when it was either calcined or treated with acid, and found it to be the same in either case.[1b] Why should two independent phenomena give the same quantitative result? Was there a mysterious air being produced, that was identical, in either calcination or acidification?

Black then reacted calcium oxide with potassium carbonate: "When I precipitated lime by a common alkali (i.e., $CaO + K_2CO_3 \rightarrow CaCO_3$), there is no effervescence: the air quits the alkali for the lime; but it is lime no more, but CCC [chalk]: it now effervesces, which good lime will not."[7] He concluded lime (CaO) contributes nothing to the alkalies; it only removed a peculiar kind of air that prevented their caustic properties from being developed.[7] Black was thus visualizing this fiery principle not as some elusive abstraction, but instead as a chemical entity, which could be passed to or from the atmosphere, or which in solution could silently pass between substances, changing their chemical identities. This was *the* key observation, according to Thomas Thomson (1773–1852), the Scottish chronicler of early 19th century chemical history: "What a multitude of important consequences naturally flowed from this discovery!"[7] (Figure 8).

Chalk and magnesia. Joseph Black then became interested in *magnesia alba* (Figure 9), then sold in Rome as a stomach remedy. Magnesia alba (magnesium carbonate, $MgCO_3$) had been known for several centuries but had been considered to be merely a variety of chalk (calcium carbonate, $CaCO_3$), even by such sages as George Ernst Stahl (1659–1734), the champion of phlogiston.[3b] (Note 1)

For his dissertation topic, why did Joseph Black choose obscure magnesia rather than well-known lime, which would have commanded more attention? A possible reason[2a] was that this mild-mannered scientist wanted to avoid contention between his advisor Alston and Robert Whytt (1714–1766), a "bright luminary in the rising University."[12a] Both Alston and Whytt had performed experiments on the medicinal effects of lime-water and had published on the subject, but there was a dispute of priority. Whytt, a specialist of the nervous system (he discovered the unconscious reflex reaction[2a]), was promoting his own "discovery," oyster-shell lime. Alston criticized Whytt's experimental methods and believed Whytt's oyster shells were no better than ordinary limestone.[2a] Black sidestepped the issue by concentrating on a different medicant.

Figure 8. In the Royal Museum of Scotland on Chambers Street (N55° 56.81 W03° 11.44), dating from 1851, is found this exhibit of Joseph Black, consisting of laboratory glassware, utensils, and bottles. The bottle in the lower left was used by Black to collect carbonic acid.[15d] Another Scottish scientist featured in the museum is Thomas Charles Hope (1766–1844), who fully characterized strontium.[3a]

Figure 9. This 0.44 kg specimen of magnesite (magnesium carbonate) is from Magnesia, Thessaly, Greece, and is the etymological source for magnesia alba *(white magnesia).[8b] Another mineral from the locality,* magnesia nigra *(black magnesia), pyrolusite (manganese dioxide) is the etymological origin of the element manganese.* Photo, elemental collection of the authors.

There was also disagreement between Alston and Whytt regarding the genesis of causticity. Whytt ardently maintained that indeed there *was* a "fiery substance" in caustic lime, while Alston favored some sort of chemical rearrangement. Black thought it would be "presumptuous to settle the quarrel between them"[2a]—but ironically, his research with magnesia did just that.

Black's experiments. For his experiments (Figure 10), Black carefully prepared pure *magnesia alba* ($MgCO_3$) from Epsom salt (Figure 11) and pearl ashes,

$MgSO_4$ (Epsom salt) + K_2CO_3 (pearl ashes) → $MgCO_3$ (magnesia alba) + K_2CO_3.

He separated the $MgCO_3$, dried it, and weighed it. Then he calcined the $MgCO_3$ to produce magnesia (MgO), resulting in a loss of 7/12 of its weight. He surmised the loss of weight was due to the expulsion of the same mysterious air, which he was able to collect and study. He demonstrated that this air, when bubbled into a solution of quicklime (CaO), precipitated a milky precipitate, identified as chalk ($CaCO_3$). Thus, the air could be "fixed," i.e., rendered nonvolatile. (This chemical procedure exists to this day as the classical laboratory test for carbon dioxide.) In subsequent class demonstrations, he fascinated his audiences by showing how the invisible "fixed air" could be literally poured, in the open atmosphere, from a glass vessel onto a candle to extinguish it.

By a series of experiments he showed that:[1b]

magnesia alba ($MgCO_3$) + heat → calcined magnesia (MgO) + fixed air (CO_2)

magnesia alba ($MgCO_3$) + acid (HCl) → magnesia salt ($MgCl_2$) + fixed air (CO_2)

calcined magnesia (MgO) + acid (HCl) → the same magnesia salt ($MgCl_2$)

Black repeated these experiments with lime, and then continued on with the other three alkalies—vegetable, marine, and volatile—and showed that in each case each mild form was simply the caustic form plus fixed air. He developed a general schedule of reactions that applied consistently for all groups. For example, he showed[1b] that reaction of "mild ammonia" with slaked (caustic) lime gives smelly (caustic) ammonia and chalk precipitate:

Mild ammonia ($(NH_4)_2CO_3$) + caustic lime (CaO) → caustic ammonia (NH_3) + chalk ($CaCO_3$)

(solution) + (solution) → (smelly solution!) + (milky precipitate)

Black's full characterizations with magnesium and calcium salts showed the two were definitely different. Thus, Black was the first to establish magnesium as a separate entity, and not just a variation of the calcareous earth.[1b] (Note 2).

Black's research further clarified the nature of the alkaline earth medicants. Previously,

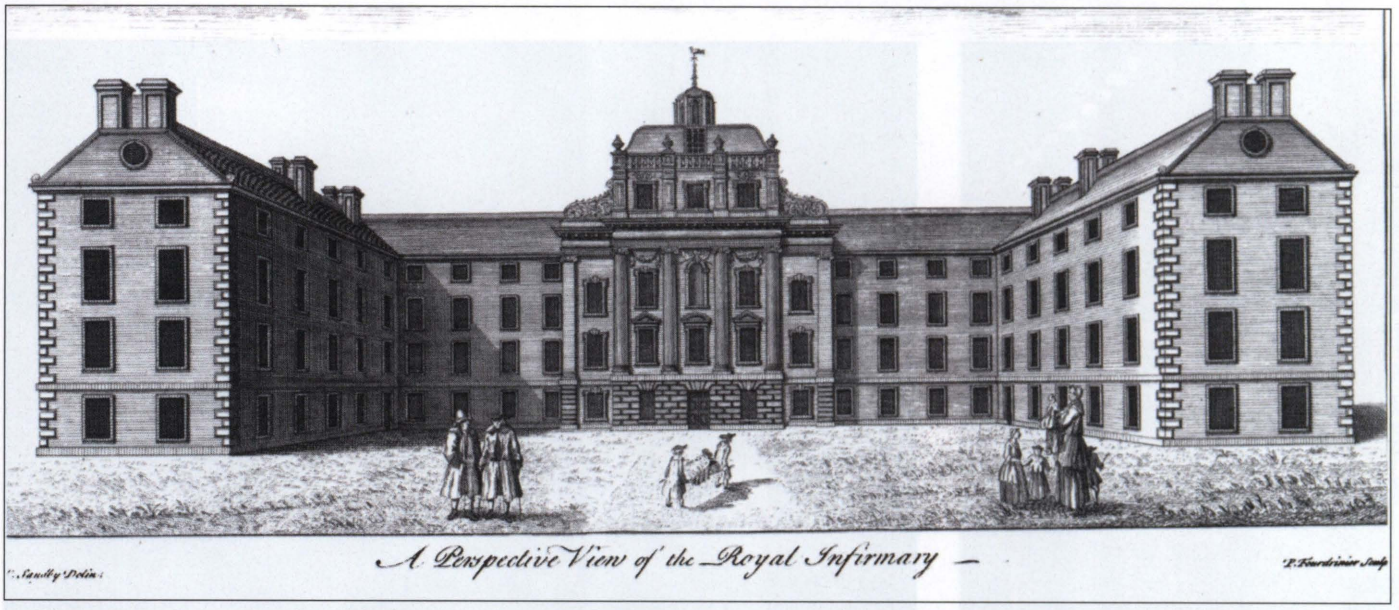


Figure 10. This is the Royal Infirmary, where Black probably performed his carbonate studies for his M.S. dissertation. The Royal Infirmary was the foundation of the Medical Institute at Edinburgh because it allowed medical studies with patients, as well as provided teaching and research facilities. It was built in 1741 and demolished in 1884. (Engraving by Paul Sandby.[21b])

"magnesia alba" or "magnesia" could each refer to either magnesium oxide (MgO) or magnesium carbonate ($MgCO_3$). Likewise, "lime" could mean "quicklime" (CaO) or chalk ($CaCO_3$). No doubt many pharmacological formulations of the 1700s were mixtures. However, after Black's defining research, the descriptions in the pharmacopoeias became unambiguous: CaO was "calcined calx" or "calx usta," MgO was "calcined magnesia" or "magnesia usta" ("usta" is an old Latin word meaning "cremated"); and the mild calcareous alkalies were "carbonas calcis" ($CaCO_3$) and "carbonas magnesiae" ($MgCO_3$).[13] Even today, "magnesia usta" is occasionally used to describe commercial MgO products.

Preamble to Lavoisier. A clear parallel exists between the works of Joseph Black and Antoine Lavoisier.[1b] Lavoisier considered combustion to be the addition of a "principe oxigène,"[1e] a real substance, as opposed to Stahl's of loss of chimeric phlogistron; Black construed calcining as the loss of a gas, instead of the gain of a "fire principle." In both cases, as acclaimed by Antoine Francois Fourcroy (1755–1809), Lavoisier's colleague and advocate, we need not invoke a "principe imaginaire" ("imaginary principle"); instead, we have an "être réel" ("real one")![14a]

In all of these studies, Black depended upon precise gravimetric analysis, perhaps the first to employ the balance totally "in almost every stage" of his chemical investigations.[15c] Fourcroy recognized Black's importance to Lavoisier's New Chemistry three decades later; Fourcroy called him "l'illustre Black, le chef et le Nestor de cette grande révolution chimique" ("the illustrious Black, the chief and the Nestor of the grand chemical revolution").[14b]

Black's laboratory. Where did Joseph Black perform his chemical experiments? This is not known for certain. There are two possibilities[15a,16,17] (see Figure 6): the Medical Institute laboratories ("Scott's and "Partner's") by the Physic Gardens, set up in 1724 to prepare medicines,[17] or the Infirmary where some lectures were held (Figure 10). The more probable choice is the Infirmary, because Black might not have been given access by the operators of the Physic Garden laboratories, owing to envy and internal rivalry.[15b,16] (Because of his successes and reputation, Joseph Black—a fresh M.D. graduate—had actually been proposed as a temporary Chair of Chemistry before Cullen returned to Edinburgh in 1766![12b, 16])

The nature of "fixed air." Black realized that air was a distinct species "dispersed thro' the atmosphere"[2b] and probably was the same *aer malignus* (malignant air) that had often been mentioned under the name of choke-damp, gas sylvestre, spiritus sylvestre, mephitic air, and gas carbonum, among others. He thought this gas was the same as that in the bubbly spas at Pyrmont in Germany[3d] and in caves such as Grotta del Cane[9a,18] (Cave of the Dog) near Naples, Italy (N40° 49.62 E14° 10.32). In Grotta del Cane, a meter blanket of a noxious gas (carbon dioxide) lay low in the cave, harmless to a human being but deadly to a canine at his feet.

Figure 11. Epsom Wells is marked by this monument in the center of a spiral road in Well Way (N51° 19.63 W00° 17.41), located 25 km southwest of London. Epsom Wells, a source of the eponymous salts (magnesium sulfate), was a fashionable spa in the 1600s and 1700s, known for the healthy benefits of its waters (mostly to prevent constipation). In 1851 the well was closed owing to pollution. The building in the background is a nursing home.

(Mark Twain in *Innocents Abroad* reported that he wanted to try the experiment at Grotta del Cane but complained that he "had no dog.")[19] Black also recognized this gas was the same as that produced by fermentation or the burning of charcoal.

Black intended to pursue the "serious study" of "fixed air and similar elastic fluids."[2b] However, a "load of new official duties was laid upon [him]"[2b] and he never resumed this

research. Later, Antoine Lavoisier would establish the chemical composition of carbon dioxide (1774),[3b] but in the meantime Joseph Black suspected there might be more to "mephitic air" than simply "fixed air." Shortly after returning to Edinburgh in 1766, he assigned the task of a more comprehensive study of mephitic air to Daniel Rutherford (1749–1819), son of John Rutherford (1695–1779), one of the original founders of the Medical Institute at Edinburgh. Daniel completed his work 17 years after Black's original dissertation; he reported his results in his own dissertation of 1772. In the next issue of *The HEXAGON*, we will see that Daniel discovered a new element in this gas—nitrogen. ⬡

Notes

1. Andreas Sigismund Marggraf (1709-1782),[3c] apparently unaware of Black's work, also distinguished magnesia from lime four years later.[9e]

2. A preliminary chemical distinction between magnesia and calcia had been made in 1722 by Friedrich Hoffmann[9d] (1660–1742), the first chair of medicine at Halle, the same university as Stahl's.[3b] A difference was observed in solubility and taste of the sulfates (calcium insoluble, tasteless; magnesium soluble, bitter).

Acknowledgments

Dr. Robert G. W. Anderson, Emeritus Fellow, Clare Hall, Cambridge University, and Dr. Peter J. T. Morris, Keeper of Research Projects, Research and Public History Department, Science Museum, London, are gratefully acknowledged for furnishing important information regarding the laboratories and residences of Joseph Black.

References.

1. J. R. Partington, *A History of Chemistry*, **1962**, Vol. III, Macmillan, N.Y., (a) 93; (b) 130–143; (c) 145–146; (d) 153–156; (e) 423.
2. H. Guerlac, *Isis*, **1957**, (a) *48(2)*, 124–151; (b) *48(4)*, 433–456.
3. J. L. and V. R. Marshall, *The HEXAGON of Alpha Chi Sigma*, (a) **2002**, *93(3)*, 42–47; (b) **2005**, *96(1)*, 4–7; (c) **2006**, *97(2)*, 24–29; (d) **2008**, *99(3)*, 42–46; (e) **2009**, *100(1)*, 8–13; (f) **2011**, *102(2)*, 20–24.
4. B. Railiené, *Andrius Sniadeckis*, [in Lithuanian], **2005**, Vilniaus universiteto leidykla [Vilnius University Publishing House], Vilnius, Lithuania, 49; 267–268.
5. A. Greenberg, *A Chemical History Tour*, **2000**, Wiley-Interscience, 134.
6. A. Greenberg, *From Alchemy to Chemistry in Picture and Story*, Wiley-Interscience, 267.
7. T. Thomson, *History of Chemistry*, **1830**, H. Colburn and R. Bentley, Vol. 1, 317.
8. P. Enghag, *Encyclopedia of the Elements*, **2004**, Wiley-VCH, **1999**, Industrilitteratur, Stockholm, (a) 324; (b) 328.
9. J. R. Partington, *A History of Chemistry*, **1962**, Vol. II, Macmillan, N.Y., (a) 229; (b) 605; (c) 648; (d) 695; (e) 728.
10. C. Brown, *Nature*, **1878**, *18(456)*, 346–347.
11. Dissertation: J. Black, *Humore Acido a Cibo Orto et Magnesia Alba*, [The acid humor arising from food and magnesia alba], **1754**, Edinburgh [translation and comments: L. Dobbin, *J. Chem. Educ.*, **1935**, *12(5)*, 225–228 and *12(6)*, 268–273]; "Experiments upon magnesia alba, Quicklime, and some other Alcaline Substances," *Essays and Observations*, **1756**, Vol. 2, Edinburgh, 157–225.
12. A. Grant, *The Story of the University of Edinburgh during its First Three Hundred Years*, **1884**, (a) Vols I and (b) II, London, Longmans, Green, and Co.
13. T. L. Hankins, *Science and the Enlightenment*, **1985**, Cambridge University Press, 90.
14. A. F. Fourcroy, *Système des Connaissances Chimiques, et leur Applications aux Phénomènes de la Nature et de l'Art*, **1800** (Brumaire, An IX), Paris, (a) 29; (b) 49.
15. R. G. W. Anderson, *The Playfair Collection and the Teaching of Chemistry at the University of Edinburgh 1713–1858*, **1978**, Royal Scottish Museum Studies, (a) 6; (b) 19–34; (c) 71–73; (d) 133.
16. R.G.W. Anderson, personal communication.
17. A. G. Fraser, *The Building of Old College. Adam, Playfair & and University of Edinburgh*, **1989**, Edinburgh University Press, 27-50.
18. W. Ramsay, *The Gases of the Atmosphere*, **1915**, Macmillan, 41.
19. M. Twain, *Innocents Abroad*, **1869**, American Publishing Co., 322.
20. National Library of Scotland, Edgar's 1765 revision, *http://maps.nls.uk/view/74400010*
21. J. Grant, *Cassell's Old and New Edinburgh*, Vol. 2, Cassell, Petter, Galpin & Co., **1882**, (a) 254–256; (b) 300.

"REDISCOVERY" ARTICLES ARE NOW ON-LINE

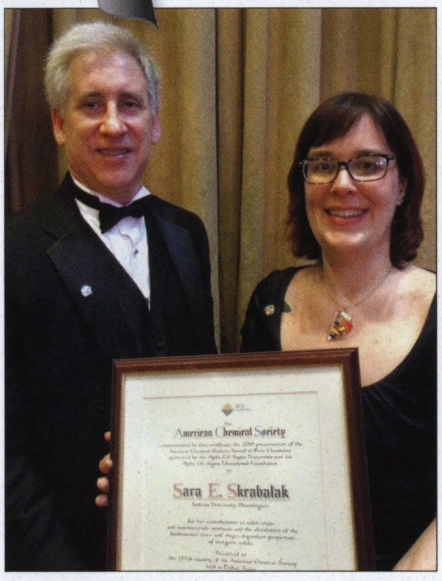
All *HEXAGON* issues that include "Rediscovery" articles—a series which began in 2000—are now on-line at: *http://digital.library.unt.edu/explore/collections/HEXA/*

These *HEXAGON* issues, as a group, are fully searchable and thus are amenable to scholarly research. One can search either for words, Boolean "OR" combinations, or for full phrases (by placing in quotation marks). Not only the original "Rediscovery" articles may be accessed, but also cover photographs by the authors and other auxiliary articles connected with the "Rediscovery" project.

Additionally, the UNT Digital Library has separated out all these individual articles and placed them in the "Scholarly Works" section. These articles may be located and perused at: *http://digital.library.unt.edu*. At the top of the webpage, search for "James L. Marshall" as "creator" and for convenience, "sort" by "Date Created (Oldest)." The "Scholarly Works" articles are not searchable as a group, but only within each individual article.

On behalf of everyone involved in the editorial and production end of *The HEXAGON*, we extend our deepest and most sincere condolences to Professor Jim Marshall, *Beta Eta 1971*, on the passing of Jenny Marshall, *Beta Eta 2003*, his dear and adventuresome life partner and co-author of the "Rediscovery of the Elements" series. The artful work of her keen eye, behind the lens of a camera, has graced the cover of *The HEXAGON* for many years.

2014 AWARDS WRAP-UP



Mark Evaniak, GPA, Beta Sigma 1980, *and Professor Sara Skrabalak.*

2014 ACS Award in Pure Chemistry

The 2014 ACS Award in Pure Chemistry was presented to **Sara E. Skrabalak**, an assistant chemistry professor at Indiana 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."

At IU, Professor Skrabalak and her students develop new synthetic methods to solid materials with defined shapes and architecture then studying the structure-function relationships of prepared materials as they are applied to energy applications.

Professor Skrabalak earned her B.A. in chemistry from Washington University in St Louis (2002) and her Ph.D. from the University of Illinois at Urbana-Champaign in 2007. She started her independent career as a faculty member at IU in 2008 after completing a postdoctoral appointment at the University of Washington-Seattle. In addition to the ACS Award in Pure Chemistry, Professor Skrabalak has been recognized as a Cottrell Scholar, Sloan Fellow, and a Camille Dreyfus Teacher-Scholar.

2014 AIChE Award in Chemical Engineering

The 2013 AIChE Award in Chemical Engineering recipient is **Dr. Paula T. Hammond**, the David H. Koch (1962) Professor in Engineering in the Department of Chemical Engineering at MIT.

Professor Hammond's research program "emphasizes the use of molecular aspects in the study and development of new materials and processes. Its basis is the molecular design and synthesis of self-assembling polymeric systems, and the understanding and use of secondary interactions to guide their assembly at surfaces as well as in the bulk and solution state."

2014 Alpha Chi Sigma Scholar

Jenna Silverman, *Gamma Nu 2012*, was selected as the 2014 Alpha Chi Sigma Scholar.

Silverman graduated in 2014 from Ohio University with a bachelor's degree in forensic chemistry. She maintained a 3.9 GPA and stands at the top of her graduating class.

At Ohio University, Silverman was involved in research, studying photochromic and electrochromic compounds with Dr. Jeffrey Rack. She also performed research in the field of chemical education under Dr. Frazier W. Nyasulu. Silverman has co-authored two publications and has conducted extensive electrochemistry research.

Last year, Silverman served as master alchemist of *Gamma Nu* Chapter. In this role, she encouraged involvement from all members because she believes the Brotherhood cannot be adequately experienced without engaging in activities with peers who share a passion for chemistry and the same interests and goals.

Silverman is a member of the American Chemical Society, the American Academy of Forensic Sciences, the Midwestern Association of Forensic Scientists and the Society of Forensic Toxicologists.

She hopes to launch her career in the field of forensic toxicology at a regional, state or federal crime lab.

2014 Priscilla Carney Jones Scholarship

Kaitlyn Perez is a senior at Bucknell University, where she is majoring in chemistry and minoring in mathematics and physics. Kaitlyn fell in love with science through the chemistry class that she took her sophomore year of high school. From the very first day of class, she found all of the material covered to be exciting. As she took other science courses, her passion for science continued to grow. When it came time to decide what major to pursue in college, Kaitlyn chose chemistry because she found the subject matter fascinating and wanted to learn much more about the discipline.

As a Presidential Fellow at Bucknell, Kaitlyn has conducted organometallic chemistry research in the Kerber group at Bucknell University since her freshman year. She presented some of her research at the American Chemical Society National Meeting in Philadelphia in August 2012. During the summer of 2013, Kaitlyn participated in the Northwestern University Materials Research Science and Engineering Center REU program, where she conducted research on silver nanocubes in the Hersam group. In the summer of 2014, she participated in the Cornell Center for Materials Research REU program, and she had the opportunity to research lead sulfide nanostructures in the Wise group.

At Bucknell, Kaitlyn has served as the president of the American Chemical Society Student Affiliates Organization and is a member of Alpha Lambda Delta Honor Society. She has been a teaching assistant for analytical chemistry, has tutored both high school and college students in chemistry courses, and is an officer in her sorority. Kaitlyn is also an American Chemical Society Scholar. After graduating from Bucknell University, Kaitlyn intends to pursue a Ph.D. in chemistry or a related field.

2014 Cooper Awardee

Yi Ying Chin is an international student from Malaysia majoring in chemical engineering. She came to the University of Tennessee, Knoxville (UTK) as a transfer student in spring 2012. She is an undergraduate research assistant with Dr. Steve Abel in the chemical and biomolecular engineering (CBE) department. In addition to being a grader for the Process Design and Controls class, she is active in various organizations such as Tau Beta Pi, Golden Key International Honour Society as well as UTK Bridges International.

Yi Ying, with a group of five other students, has represented UTK in the EPA P3 Competition (People, Prosperity, and the Planet Student Design Competition), in which the team presented their project at the 2013 National Sustainable Design Expo in Washington, D.C. and received honorable mention. In fall 2013, she did an engineering internship in Process Control, a UTK collaboration with Eastman Chemical Company, where the team of interns collectively worked on optimizing plant operating conditions to maximize production. Due to the excellent mentorship and guidance by many of the CBE faculty, her experience at UTK has been a phenomenal journey.

Yi Ying's goals upon graduation include returning to Malaysia to serve her home country in the chemical industry and earning a Ph.D. in chemical engineering after gaining some professional experience.

2014 *Beta Eta* Distinguished Teaching Assistant Award

Stephen F. Sanders is from Canton, Ohio. He graduated from the University of Dayton in 2008 with a bachelor's degree in biochemistry. He moved to Dallas in the summer of 2009 to begin teaching at Mesquite High School. During his time at Mesquite High School, Sanders taught both chemistry and physics. He believes that chemistry can be a great tool to help people become better problem solvers. Sanders' classroom experience and knowledge of current research helped accomplish this goal. In 2013, he began working with Dr. Teresa Golden on a Ph.D. in analytical chemistry at the University of North Texas. He hopes to continue his collaborations with chemists in industry and academia.

2014 Dunlap Scholar and Dunlap Grant

Kathryn Westbrook, *Iota 2012*, is a senior at Rose-Hulman Institute of Technology. She is from Marion, Ohio. She will graduate in May 2015 with a bachelor's degree in chemical engineering and a minor in chemistry. She has conducted research at The Ohio State University in nanoscale science and engineering and at Rose-Hulman in water filtration. Currently, Westbrook is involved in various clubs and societies, including Alpha Chi Sigma, Blue Key Honor Society, the Society of Women Engineers, Omega Chi Epsilon and the American Institute of Chemical Engineering. She has worked as a supervisor and a tutor in the Rose-Hulman Learning Center for the past two years. Combining her lifelong passion for animals with her interest in chemistry, she plans to contribute to the animal science field by enhancing filtration systems in zoos and aquariums.

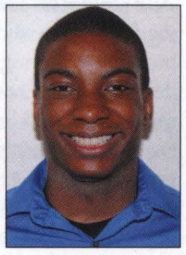
Dunlap Grant

Lauren Miller is a junior at Rose-Hulman Institute of Technology, where she is double majoring in biomedical engineering and biochemistry/molecular biology. She joined *Iota* Chapter in spring 2013. In addition to Alpha Chi Sigma, Miller is a member of Alpha Omicron Pi, the varsity tennis team and the jazz band. She has completed internships with Covidien and Wenzel Spine and hopes to put her experience to work in a career in tissues engineering.

Dunlap Honorary Scholar

Alison Chartier is originally from Shelby Township, Michigan, and is a senior at Rose-Hulman Institute of Technology. She intends to graduate in March 2015 with a degree in chemistry and biochemistry/molecular biology and a German Technical Translator certificate. After graduation, Chartier hopes to attend medical school. She has been very involved in *Iota* Chapter since she initiated in fall 2011. She has served as Vice Master of Ceremonies, Master of Ceremonies and Vice Master Alchemist. She also has obtained a green level wyvern pin.

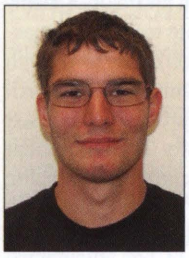
2014 *Gamma Eta* Scholar



Miles Gray, *Gamma Eta 2013*, is a senior at Marshall University where he is majoring in biochemistry and forensic chemistry. He is from Glen Ridge, New Jersey, where he first discovered his interest in chemistry and law enforcement in a forensic science elective class in high school.

While at Marshall, Gray has found his true interest in science through his participation in both chemical and biochemical research projects and his involvement with Alpha Chi Sigma. Currently, Gray works as a learning assistant for organic chemistry courses. He is a member of the Society of Black Scholars and also is involved with Marshall's Baptist Christian Ministry and a local soup kitchen in Huntington, West Virginia. After graduation, Gray plans to attend medical school.

2014 Jody Aaron Goad Scholarship



The *Gamma Iota* Chapter established a scholarship in memory of Jody Aaron Goad, *Gamma Iota 1995*, who passed away in 2003 of brain cancer. The scholarship is awarded to a student of chemistry or any chemistry-related major attending Virginia Polytechnic Institute and State University in Blacksburg, Virginia. Jody was Master Alchemist of *Gamma Iota* Chapter from 1997–98 and Reporter from 1996–97.

Kevin Hannon, *Gamma Iota 2011*, is the 2014 recipient. Kevin writes, "I decided to pursue a degree in chemistry at Virginia Polytechnic Institute and State University. As I was sitting in general chemistry, I remember my professor mentioning the Schrödinger equation and talking about quantum mechanics topics and how the Schrödinger equation can explain many aspects of chemistry. I started looking through my dad's textbooks on physical chemistry and trying to learn more about physical chemistry through many books. I finally decided to ask Professor Crawford to join his lab for the fall of my sophomore year.

"Most of my research projects are about computing chiral optical properties in solutions. This area of research interests me because it again goes back to modeling reality. As my experience with research increased, I started to present research at a few conferences.

"As a member of Alpha Chi Sigma, I was chair of the tutoring committee for the year of 2012–2013. This Fraternity provided free tutoring for college students in chemistry and also provided a tutoring service for high school students. Teaching has always been a passion of mine and I had an amazing time explaining chemistry concepts to these students. Every semester, I try to privately tutor a few students as it is a challenging task and I find it very enjoyable. It also keeps me up to date with my chemistry and provides a way for me to keep thinking about these concepts."

2014 *Alpha Beta* Alpha Chi Sigma First-Year Award

This award is designated by the *Alpha Beta* Chapter of Alpha Chi Sigma to a student in first-year chemistry who has demonstrated an interest in chemistry, shown outstanding academic potential as judged by instructors, and has demonstrated leadership with fellow students. **Callie Chappell** received the 2014 award. As a member of the UM Policy Debate team, she is passionate about the intersection of chemistry with public policy and the humanities. Her research interests lie in biochemistry, but she has a soft spot for organic chemistry and molecular orbital theory. She is currently pursuing research in Nicolai Lehnert's group, doing work in bioinorganic chemistry and proteins.

Report from the New Jersey Professional Chapter

Submitted by Melissa Liberatore-Moretti, *Gamma Omicron 2004*

Twelve brothers and their guests met up for the Atlantic Central District 'Pro Day' on Sunday, April 6, 2014, hosted by the New Jersey Professional Chapter. The Atlantic Central District holds many of the Fraternity's active chapters and groups, and it was determined that holding a centrally-located gathering would be a great way to brainstorm about promoting chemistry and recruiting professional members—while having fun! Representatives from the New Jersey, Delaware Valley, and Washington, D.C., professional chapters were in attendance, with the goal of discussing the future of the Fraternity and the roles of our professional chapters. While the professional chapters provide support and assistance to local collegiate chapters, professional chapters have different challenges and goals that are sometimes overlooked in the focus on collegiates.

Enjoying a good meal and conversation at the Spring ACS meeting in Dallas

Spring Luncheon at the American Chemical Society Meeting

A group of brothers attending the 247th American Chemical Society National Meeting and Exposition in Dallas attended the traditional Alpha Chi Sigma social luncheon on Tuesday, March 18, at the Texas Spice Restaurant. In attendance were: Gary D. Anderson, OA, *Alpha Eta 1962*, Sally Mitchell, *Pi 1980*, Cary Supalo, *Beta Nu 1997*, Allan Ford, *Beta Rho 1967*, Nathaniel Schreiber, *Alpha Rho 2012*, Melissa Meyerson, *Alpha Rho 2011*, Mike Mandler, *Alpha Rho 2011*, Amanda Riojas, *Beta Eta 2009*, Chris Jeffrey, *Beta Theta 2008*, Mark Evaniak, GPA, *Beta Sigma 1980*, Charles (Chuck) Carroll, *Zeta 1990*, Hector Gonzalez, *Beta Eta 2008*, and Diana Lundelius, *Beta Theta 1975*.

Atlantic Central District Pro Day, April 6, 2014. Brothers from the New Jersey, Delaware Valley, and Washington, D.C. Professional Chapters hold a discussion about the goals of the Fraternity after a winery tour.

The day began with brunch at Bitter Bob's Restaurant in New Hope, Pennsylvania. The atmosphere was casual and friendly, and the menu was comprised of delicious comfort food, such as savory omelets, pancakes, and breakfast sandwiches. The brothers engaged in an informal and lively conversation about current events, while the kids were engrossed with crayon drawings and chats about school. Afterward, everyone headed to the Unionville Vineyards in Ringoes, New Jersey. The program began with an in-house wine tasting, where several options were available from the red, white, and dessert wine categories. A particular favorite among the brothers was the Vat 19 Port dessert wine, which had aromatic notes of chocolate, vanilla, cherry, and prune. Soon thereafter, the winery tour commenced with a

Epsilon graduating seniors—best of luck in your futures.

Year's End at the *Epsilon* Chapter

Submitted by Jenny Sitko, *Epsilon 2012*, Alumni Secretary

The *Epsilon* Chapter at Indiana University finished off the 2013–2014 year strong! *Epsilon* initiated 23 new members into the Brotherhood on Friday, April 18. It was a long and fun night and we were so glad they could all join us. Spring pledge season was a great time and we are glad they all enjoyed learning about Alpha Chi Sigma and were able to bond with each of their pledge brothers and the active members.

Epsilon also held their annual Spring Banquet on Saturday, May 3. This year's theme was "Masquerade" and the food was amazing! Special thanks to our banquet committee for all their hard work and planning to make it a great time for all. We also said thank you and farewell to all of our graduating seniors. We are proud of all they have accomplished and will accomplish in the future.

Epsilon is geared up for the fall semester, where we start another pledge season and another feast of great times. We cannot wait to see what the future holds.

brief history of the area and a background on the winemaking process. The brothers were escorted through a series of vats and then into the winery 'lab.' The lab was very intriguing to all, with its recognizable glassware and equipment; some brothers were curious about whether a gas chromatograph was present, but none could be found. The group was subsequently led outside to see the budding vineyards, which was the final part of the tour.

The brothers then took advantage of the beautiful weather and held the discussion outside on the vineyard grounds. Our GCA, Helen M. M. Webster, was key in facilitating the dialogue. The focus was first on the Fraternity's role of promoting chemistry; the brothers encouraged each other to take advantage of their local sites and events, such as science fairs, volunteering, and college initiations. In addition, they examined past events and why they succeeded or needed improvement. For example, New Jersey Pro brothers extolled the benefits of participating in ACS community events at the Liberty Science Center. Additionally, Delaware Valley Pro brothers reveled in providing "Adventures in Chemistry" science shows to local elementary schools; Washington, D.C. Pro brothers enjoyed performing demonstrations with the *Gamma Iota* Chapter at the USA Science & Engineering Festival. The second topic was on recruitment and monthly dinner meetings. Many brothers were keenly interested in meetings that were family-friendly (with more convenient times and locations) in order to ensure a higher attendance. It was noted that the future of the Fraternity depends on enlisting new professional members and offering continual support through its network and its educational volunteering events. In all, the District Pro Day meeting was deemed a success, and plans are now in progress for future gatherings.

New Jersey Pro continues to grow and welcomes new members to our monthly meetings. For more information about our chapter and upcoming events, visit our Facebook page at *www.facebook.com/groups/82946786520* or email us at *alphachisigmanjpro@gmail.com*.

Remodeling at *Beta*

Submitted by Srijay Rajan, *Beta 2013*

Over the summer, the *Beta* Chapter Alumni Association completely redid the siding of the chapter's house, resulting in a pleasant, modern look that complemented the neighboring homes. In addition, chapter members are currently working on projects to beautify the interior, including painting a periodic table on a wall in the dining room. The *Beta* Chapter has called this location home for more than 20 years.

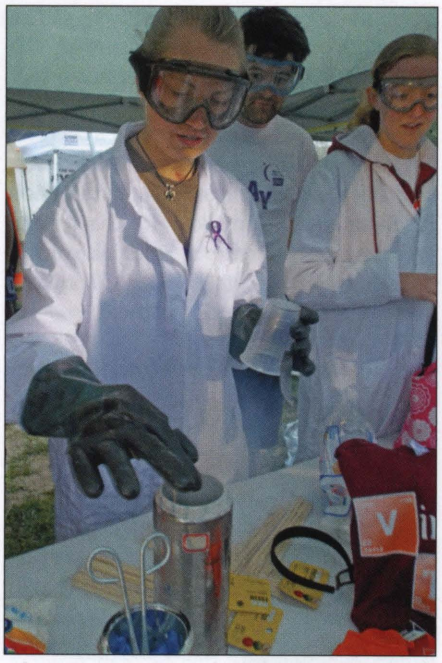
Fourth Level Wyvern: David K. Hildebrandt, *Gamma 2011*

Submitted by David K. Hildebrandt, *Gamma 2011*

Saturday College, better known as SatCo, happens twice a year on our campus. Numerous student groups hold recreational activities oriented toward the first-year students. These days are meant to build a campus community and to engage, in particular, our new students. Since ΑΧΣ includes science outreach in its mission, the brothers and I took a group of first-years to the local Great Lakes Science Center, where we typically perform our outreach activities.

At the GLSC, we have fun blowing up balloons without using our mouths (using baking

The newly remodeled Beta *house has been home for the chapter for more than 20 years.*



Haley Whitcraft, Gamma Iota 2012, *dips a marshmallow into liquid nitrogen for someone to eat. We charged $1 for two marshmallows and it was a huge success.*

Three brothers helping two visitors of the Great Lakes Science Center with the classic baking soda and vinegar experiment.

soda and vinegar), making slime (with Elmer's glue and borax), and the non-Newtonian fluid, Oobleck (from cornstarch and water). Occasionally, we bring non-polar sand and make bubbles in a beaker (from dry ice). Again and again, the highlight of our activities is watching the children's faces slowly gain that spark of curiosity. In their wide-eyed wonder, some show off their new science to their parents, while others just want to experiment more. We are delighted when some of the parents ask us for other experiments they can do at home.

Performing science outreach with my brothers has been quite a rewarding experience. As a result, I have continued these activities after moving to graduate school at the University of Minnesota. I have also established a tie with the brothers of *Beta* Chapter and will be joining their outreach efforts in the coming months.

Relay For Life at *Gamma Iota*

Submitted by Haley Whitcraft, *Gamma Iota 2012*, Alumni Secretary

Virginia Tech takes pride in having the largest, most lucrative collegiate level Relay For Life event in the world. Relay For Life is a fundraising event devoted to ending the fight against cancer and is a popular event on many college campuses worldwide. This year the *Gamma Iota* Chapter of Alpha Chi Sigma decided to put all they had into Relay For Life and challenged themselves with a fundraising goal of $800.

Gamma Iota *brothers man the booth at Relay For Life (l to r: Mitchell Lucas, Christopher Yoo, Olivia Ross, Christian Hall, Rae Crews, and Alex Leonard). The letters they are holding are new and recently made by the Fraternity.*

The philanthropy committee, headed by Haley Whitcraft and co-chair Anastasia Arkhipova, dedicated much of fall semester to planning Relay For Life. This year, our chapter has been focused on getting out into the community and making a name for ourselves. This event was the perfect opportunity to donate to a good cause, bond as a brotherhood, and get the name of Alpha Chi Sigma out into the community.

At the start of the semester, for a beginning fundraiser, a few brothers agreed to shave their heads if a goal of $500 was reached. This part of the fundraiser started in early March and continued until the actual night of Relay For Life on April 25. Brothers Jarret Rowland, Michael Hartman, Alex Leonard, and Kevin Hannon were the brave souls who volunteered to shave their heads. Michael Hartman helped raise the most money for this section of the fundraiser by

reaching out to other organizations he is a part of to obtain donations. As a fraternity, we used this opportunity to spread information about…and get people excited for…chemistry!

The big push in our planning was on fundraising for the night of April 25. Without the help of a dedicated philanthropy committee, this event would not have happened. The hard-working committee members agreed to biweekly meetings to make this event (and our other philanthropy events) successful. The committee wanted something to help us fundraise on the night of the event that would draw people in and truly get other college students excited about chemistry. We turned to liquid nitrogen flash frozen foods to do the trick. We dipped marshmallows into liquid nitrogen in order to flash freeze them. If eaten quickly, the marshmallow tastes like a lucky charm and was definitely a crowd favorite. We took the opportunity to teach the crowd about some of the properties of liquid nitrogen by doing this fun and exciting event. We also created a chemistry trivia game that could be played for a small price. We ran it like a game show and asked the crowd questions like "What is the second group on the periodic table called?" and "Which element is the standard to determine amu?" The game was a crowd pleaser for sure and as prizes we gave out wallet size plastic periodic table cards and our own Relay For Life shirts that said "Kicking Cancer in the ΑΧΣ."

Overall, Relay For Life was a huge success. After the fundraising portion of the night, many of the brothers and pledges stayed until 4 a.m. in a 10-person tent spending time together as a brotherhood sharing stories, playing games, and hanging out. In the end, the *Gamma Iota* chapter raised more than $1,500 for Relay and in the process grew stronger as a brotherhood and taught our peers about chemistry.

Sharon Oldani, Beta 2012, *at an outreach session*

A Note for Contributors

We certainly appreciate the added appeal of pictures in *The HEXAGON*. When taking photos for submission, please:

- Always use a flash indoors.
- Do not edit or alter your images. *The HEXAGON* production staff can and will determine if an image needs color correcting or additional processing.
- Set your digital camera quality to its highest setting with the least compression. Photos that are less than 8 inches wide at 72 dpi, or that have a file size of under 1 megabyte, may be too small for print production.
- Please send us the image file that is directly from the camera. Photos that are extracted from iPhoto albums, Facebook pages or Word documents have file sizes that have been compromised.
- Print photos are welcome!

Fourth Level Wyvern: Safety in Outreach at *Beta* Chapter

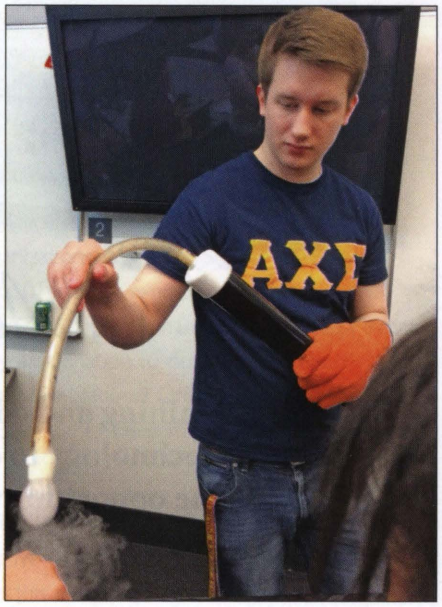
Submitted by Sharon Oldani, *Beta 2012*, and Adam Seubert, *Beta 2011*

Outreach through the *Beta* Chapter of Alpha Chi Sigma has always been a mix of education and excitement. However, as our chapter, and the University, have implemented new safety measures, it has become increasingly more difficult to find demonstrations that are educational, exciting, and safe. Undaunted, *Beta* Chapter has worked hard to find and use safe demonstrations that are just as exciting and educational as things that go boom!

One of the demonstrations that *Beta* Chapter has cut out of its repertoire is a methanol/ethanol differentiation test that we would use in chemistry shows. This demo was performed by adding about 1g of boric acid to two watch glasses, followed by pouring about 10 mL methanol and ethanol into each of the watch glasses. After mixtures are ignited, the methanol mixture burns with a green flame, while the ethanol mixture burns yellow. This is because the reaction between the boric acid and methanol occurs more completely to produce a boric ester, which burns with a green flame.

Although audiences get very excited about lighting things on fire and seeing the different colored flames, we no longer use this demonstration because University of Minnesota professor and fellow brother Dr. Kenneth Leopold advised us against doing it due to potential hazards. Methanol is quite volatile, and if the temperature in the room is high, or the watch glass was warm, the vapor cloud of methanol can ignite all at once.

We have turned to dry ice as a safer yet still-fun alternative for demonstrations. Although there are still some dangers involved with using dry ice, they are minimal and the outreach coordinators of *Beta* Chapter go over proper handling and care of the dry ice. There are many demonstrations that can be done using dry ice.



Adam Seubert, Beta 2011, *and the Dry Ice Wand*

For smaller demonstrations, we have a dry ice wand. We use a PVC pipe that is closed on one end. We add dry ice and hot water to the open end. Then we add a cover with a flexible tube to the top of the pipe. The flexible tube can be dipped in soapy water and you can blow bubbles using the sublimated carbon dioxide.

For our stage presentations, we make a basic solution of sodium hydroxide and add an indicator. We add the dry ice, whereupon it reacts with the water to create carbonic acid and causing the indicator to change color. Both demos are very exciting for children, and we use the opportunity to teach scientific principles such as phase change, sublimation, and pH.

Safety restrictions might seem like they compromise the excitement of chemistry demonstrations, but there really are plenty of fun activities and demonstrations that can be carried out. The *Beta* Chapter of Alpha Chi Sigma always strives to increase safety while still keeping kids interested. We continue to search for other safe and exciting demos.

If everyone reading this page sent this...

...Alpha Chi Sigma could:

- **Provide training and education to our growing chapters.**
- **Improve technology to enrich member communications.**
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Do you remember your initiation? This was the first time you supported Alpha Chi Sigma and created the bond of brotherhood. The hexagon? The red carnation? Which other fond memories do you have?

Now will you actively participate in your lifelong membership with a donation to help others achieve those memories?

A $50 contribution will designate you as an active professional brother and will help support our endeavors as we continue to bring Alpha Chi Sigma to new and familiar institutions, increase our membership, and expand collegiate and professional chapter programs. You can donate by returning the attached envelope or by visiting *www.alphachisigma.org/donate*.

Last year, we received more than $95,000 in professional contributions, which allowed us to continue expansion efforts, provide higher quality member cards and certificates to our new brothers, and relocate to a more modern and efficient National Office. This year, your annual professional contribution will help meet our operating obligations and allow the Fraternity to improve programming, enrich member communications, support outreach activities and continue our expansion.

Also, your annual professional contribution:

- 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 Nov. 30, 2014.
- entitles you to receive all four issues of *The HEXAGON*. You also will be recognized in the Fall 2015 issue.

Each donation, regardless of the size, helps enhance the journey for future generations. We hope you will fulfill the pledge you made upon your initiation to promote The Three Objects by giving generously today.

Watch your donation grow!

Supreme Council challenge for new gifts

For all members who make their first donation ($25 or more) before Aug. 31, 2015, the Supreme Council will donate an additional $5 on your behalf, up to $1,000 total. You can donate by returning the enclosed envelope or by visiting *www.alphachisigma.org/donate*.

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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 brother 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 over a 10-year period, become Reserve Fund members and are granted active professional member status for life. 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.

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2013-2014

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Special recognition is given to the Reserve Fund Members whose additional contributions help to ensure the long-term financial security of the Fraternity.

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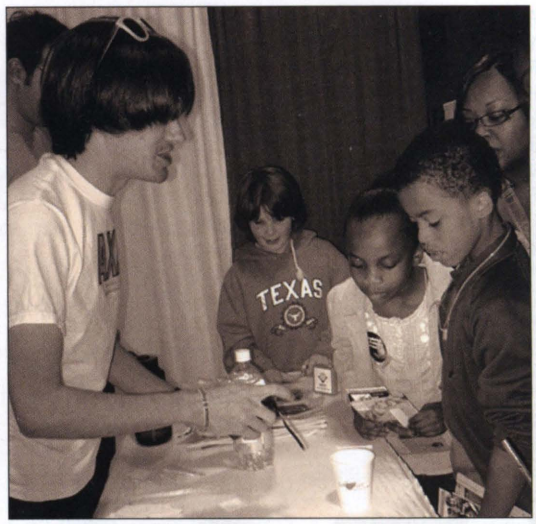

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EPSILON
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Abigail Marie Brenner
Branden Eun-Min Chung
Asiyah Din
Sara Elizabeth Fye
Audrey Catherine Hemmer
Brandon Zachary Hocker
Anish Karlapudi
Jessica Danbee Kim
Rayne Soyoung Kim
Justin Michael Knight
Alexa Jo Loncharich
Megan Alese McDonald
Christina Ann Moe
Jennifer Ellen Nicholas
James Matthew Penticuff
Onye John Robert-Eze
Samantha Paige Schreiner
Neha Sehgal
Devki C. Shukla
Theresa Marie Spech
Bailey Jean Spencer
Wyatt Hunter Wright

ZETA
Nicholas Nathan Ansai
Suleiman George Ayoub
Patrick Carlo Benassi
Vaishali Sudha Chundi
Joshua Arthur Cohrs
Sarah Marie Crowley
Kathleen Marie Daly
Matthew Gregory Fisher
Darrion Jaleel Greene
Kevin Huang
Abdul Rahim Ibrahim
Helena O. Igbo
Ericson Esegboria Imarenezor
Nicholas Toshio Iwai
Blake Anthony Izzo
Stephanie Noel Konecki
Xinyi Alice Li
Jared Matthew Madden
Emilee Anne Nawa
Kaudee Mycah Hollite Racelis
Natalia Recko
Michael Brandon Stone
Kalee Taylor Sweeney
Aditi Ajay Warhekar
Courtney Frances Wesa
Kevin Clint Yu

IOTA
Ryan Michael Beere
Chandler Alan Brown
Taelar Maree Burris
Napassorn Chanrotchanaphan
Richard Bruce Clark
Jamie Marie Crowell
Sarah Beth Finer
Daniel Bruce Gregersen
Kaelyn Renae Griffin
Tyler Paul Harrison
Alex Thomas Jansen
George William Lundie
Kathryn Lynn Maier
Taylor Stone Ransdell
Daniel Ricardo Reyna
Brooks Stephen Rodibaugh
Zachary Alexander Rothenberg
Christopher Michael Sokoloff
Arielle Topacio
Christopher Schantz Wade
Anna Mary Weber
Stephanie Jo Wilson

MU
Patricia Akrivoulis
Andrea Colleen Borg Fisk
Joseph Michael Miseirvitch
Thomas Robert Mouser
Christopher Michael Olivier
Kristin Lindsey Phyles
Christopher Edward Redus
Benjamin Adam Shriber

PI
Tyler Richie Bague
Aaron L. Burlew
Katie L. Garrison
Vivian Sofia Gomez
Amanda T.T. Lieu
Sarah Ahmad Mehdi
Ian Bennett Shick

RHO
Ashley Nicole Alemanni
Megan B. Cooke
Michelle Taylor Floyd
Si-Le Bernadette Lee
Parth Gaurang Majmudar
Kylie Nikole Nowicki
Rosa Eunbi Park
Danny Rahal
Blake Christopher Riley
Cody Vientos
Brian Cody Wagoner
Timothy Joseph Wahl
Hanying Wang
Julian Daniel Sunday Willett

SIGMA
Anthony Matthew Achacoso
Nayif Sohail Alhomoud
Ricardo Samson Iglesias
Jaehee Jung
Colby Mitsuko Pong
Aprilgate Wang
Ross K. Ward
Emma Elizabeth Woolf
Thomas Wu
Emily Ann-Min Yao
Runyu Zhao

TAU
Rishi Gupta Agarwal
Lisa N. Awaitey
Brecken June Blackburn
Tiffany Jill Bruno
Leticia Collado
Brittany Elizabeth DeCola
Leah Therese DeWitt
Keely Mae Oltion
Jeannie Yoojin Park
Komal Patel
Ambrose Gerard Plante
Mac L. Sennett
Jared Srinivasan
Ashley Saryelle Tate
Paola Carolina Torres
Ashley Emma Vincent

ALPHA ALPHA
Juan Manuel Camacho
Katherine Anne Carr
Monica Miaoxia Chan
Huan Yu Dennis Chang
George Qiaoyu Fei
Lauren Mary Gibson
Renata Tuoni Hanna
Samuel Alejandro Jacobo
Sarah Ann Keglovits
Kristen Laura Kolberg
Robert Forest Kravec
Rachel Yun Shi Lim
Jovan Alexander Lopez
Marcos Nguyen Lopez
Kennedy Caroline McCone
Preethi Nareshkumar Pallegar
Makena Noel Alohilani Pule
Michelle Ling Ramseier
Vasil Hristov Vasilev
Andy Nguyen Vu
Joy Yiran Wang
Ye Wang
Sachie Kiri Weber

ALPHA BETA
Chelsea Marina Adams
Alexander Harrison Bedard
Jennifer Ashley Carter
Kathleen Michelle Casebeer
Olivia Marie Cholewa
Kaitlyn Louise Clark
Crystal Ann Cole
Courtney Mae Collins
Eric Douglas Fink
Chaney Lee Hathaway
Druha Karunakaran
Wyatt Forrest Kuhlman
Ross W. Kynast
Thomas Aiwei Finfgeld Louis-Goff
Brandon Nicholas Moretti
Eric Henry Moss
Lisha N. Murphy
Kyle James Pettibone
Alexander Earl Pool
Alissa Reddy
Megan N. Reddy
Ryan Lee Rogers
Jeremiah John Simon
Irene Catherine St. Charles
Robert Paul Stefanski
Asher Huston Strayhorn
Nicolas Alfredo Suarez
Katherine Theresa Vaidya
Nicholas Jay Webster

ALPHA EPSILON
Ryon LaMont Arrington
Patrick Thomas Boyle
Caroline Ceremsak Davitt
Nicole Ann Ebalo
Erin McCoy Hall
Julia Pearl Holber
Kathryn Michelle Jan
Jinfeng Jiang
Min Ihl Kim
Courtney Anne Kolberg
Evan Scott Kominsky
Josephine Shih Han Lee
Raymundo Zheng Wu Marcelo
Vivek Nishad Mehta
Paul Simon Moiseyev
Mark David Orland
Kara Elizabeth Skjoldager
Zachary L. Strittmatter
Karuna Ashna Tirumala
Louis Shen Wang
Cameron Wong
Courtney Sunghee Yoo

ALPHA THETA
John Paul Baer
Michael Dong
Ilya Gurevic
Danny W. Linggonegoro
Gerardo Perez
Tristan Nicole Thompson

ALPHA KAPPA
Chelsea Karina Granados
Walter Dean Harman
Jonathan Andrew Ledesma
Yi-Ting Liu
Nilufar Mirshahi
Chris William Ables Nichols
Katurah Sattva Roell
Liuzhi Zhang

ALPHA PI
Katherine Joy Burke
Austin Gold
Ida Karimi
Aaron Miguel Morales
Julia Nicole Peters
Zamin Hasnain Raza
Hannah Sue-Jung Yi

ALPHA RHO
Malik Isaiah Antoine
Jacqueline Han
Amita Jain
Hannah Meghan Lebovics
Anna Lieberman
Anna Lu
Max Baker Pereboom
James Tuo
Claire Elizabeth Wortmann
David Nathaniel Yim

ALPHA UPSILON
Frances Ruth Greathouse
Joshua Edward Laarman
Brittney Michele Riedel
Brian Alvin Snyder
Tyler Ong Zhang

ALPHA OMEGA
Samera Ahmad
Kareme Dale Alder
Rishi Ratna Bollu
Dominique Catena
Thomas Andrew Diaz
Stacy Monique Grant
Karisma Rakesh Gupta
Emily Elizabeth Harry
Farida Jariwala
Jimin Kim
Rowan Elyse Kraft
Megan Mg Le
Wen Liu
Jocelyn Marie Macho
Lauren Ann McCarthy
Claire Eileen McCauley
Brent T. McDaniel
Brady A. Munz
Kuin Yogesh Patel
Rainey Elizabeth Patterson
Ryan Elliott Quinones
Phillip Marshall Stouffer
Alexandra Leigh Sumner
Matthew V. Todaro
Candice Zena Ulmer

BETA GAMMA
Cornelius Ga-Tsun Chan
Gary Chang
Amanda M. Chen
Felix Hoan Chen
Bryan Gregory Chin
Jong S. Choi
Garrett L. Chow
Zhen Cui
Justin Hung Duong
Aaminah Salim Ginwalla
Alejandra Gonzalez
Kristy Alexis Hwang
Benj Dany Jara
Cyrus Yang Jin
Hannah Pei Li C. Lee
Justin A. Lee
Bernice Wan-Yi Lin
An Hong Pham
Michael Quang
Keith Douglas Shaffer
Jerremy E. Stroman
Alexander San Thuy-Boun
Anthony Tung Ho Tong
My Thanh Vo Luong
Michael Masaharu Yamano

BETA DELTA
Jamie Catherine Bader
Piero Giordano Burzio-Roca
Sunghee Briana Choi
Aaron Joseph Latal
Amanda Jane McDuffee
Kyle Travis Norris
Ian Patrick Schroen

BETA ETA
Irene Huang
Alissa Pitsnukanh
Krystal Sager
Abbey Tran

BETA NU
Taylor Noel Bauer
Miranda J. Kaake
Joseph Nicholas Kass
Regina Marie Klopping

William Joseph Louie
Heather Marie Morris
James Chris Pastor
Rachel Catherine Svetanoff
Dustin W. White
Jordan Celeste Wilkes

BETA PI

Kyle Matthew Gosiengfiao Alipio
Andrew Jinsoo Choi
Ashley Sun Me Choi
Byron Chou
Ya-lun Chung
Emily Win Hou
Alice Yvonne Huang
Wesley Ryan Hung
Edward Hyunsuh Kim
Irene Lee
Sandra TuHan Lee
Victoria Sarah Leung
Charles Jourdan Li
Christopher Niu
Gene Lee Park
Keya Patel
Pauline Yen Tran
Susan Jun Whang
Jessica Zhang

BETA RHO

Denise Andrea Cobb
Katherine Cooley
Aaron Day
Hannah Devore
Victoria Floyd
Morgan Fortunski
Cassidy Frost
Tate Gilchrist
Sarah Gorn
Caleb Lang
Helena Malinakova
Andreanna McLeod
Brenna McMasters
Alex Meier
Elizabeth Melton
Clinton Meyer
Jake Nagy
Kendri Salmans
Carina Victoria Anne Wade
Ben Weintrub
Shuyu Zhang

BETA SIGMA

Xiau Ya Huang
Marina Koroleva
Dustin Schroeder

BETA PHI

Aaron Charles Dinger
Darrah Danielle Jorgensen
Joseph Allan Marshall
Derek James Morrison
Carl Jacob Poss
Amber Jordan Scheele
Christopher Michael Schiller

BETA CHI

Brant Derwent Boucher
Joshua Vance Chamberlin
William Reed Echols
Jason Richard Halmo
Benjamin Wei Lam
James Hua Chris Howard Lau
Joseph Nehemiah Link
Zachary Stephen Martin
Harrison James McNabb
John August Mohay
Alan Mitchel Owens
Samuel Edward Sheffield
Hugh O. Thurman

BETA PSI

Danielle Elizabeth Bortoli
Jaclyn A. Parks
Reid Anthony Tevonian

GAMMA BETA

Amanda Katherine Beckman
Lauren Ashley Finney
Yooyeon Jung
Nicole Diana Kendrick
Chelsea Lynn Massaro
Stephen Joseph Patacsil
Bhavi Nailesh Patel

GAMMA DELTA

Chauntelle F. Brown
Aubrey Sinah Butcher
Justin Ray Dorris
Malory M. Duerr
Kamisha A. Grouby
Hillary T. Henry
Katherine R. Johnson
Mitchell Elizabeth Jones
Kelsey Ann Jordan
Trevor Edward Miller
Lina Mariana Okenfus
Olivia Michelle Pearce
Joshua Meyer Schmidt
Danielle Joy Schwartz
Raychel Bryana Simpson
Ryan Michael Sullivan
Alexis Ann Violette

GAMMA ZETA

Ryan Yinghua Cox
Erik Daniel Crenshaw
John J. Detlefs
Erin E. Doherty
Madison Edwards
Kezia Emeny-Smith
Brooke Danielle Engle
Joshua D. Lehrer
Kyle Albert Meyer
Heather Marie Milestone
Zachary James Petrek
Alicia Raquel Romero
Craig Phillip Seaver
Lucas W. Souza
Kristiane R. Torgeson
Camille P. Villanueva

GAMMA ETA

Tyler Cherie Bradley
Sumaiya Chaudhry
Kaitlin N. Christian
Isaiah Timothy Dishner
Jack Stuart Hopkins
Philip Harrison Kirk
Jordan Cruz Martinez
Rosalynn Quinones
John Frank Rakus
Gregory Austin Rooper

GAMMA THETA

Brian P. Adams
Lindsey C. Applegate
Julie E. Bays
Kelsey Marie Beasley
Travis Lee Belknap
Richard J. Bell
Stephanie Elaine Billeck
Connor William Burton
Alexander James Carlisle
Leela Anne Chapman
Anusha Cherupalla
Emily Marie Churchill
Sidney Jo DeBie
Kassidy Claire Deutschmann
Eddie Franklin Flynn
Morgan LeAnn Grandon
Cody E. Hendren
Tinting Hua
Meagan Elizabeth Kilian
Emily M. Leddin
Kyle A. Martino
Kayleigh Anne McElveen
Emily Diane Million
Mollie M. O'Day
Hannah Marie Olson
John David Orlet
Caleb W. Siebert
Ian Christopher Siercks
Danielle M. Soest
Taryn Kavr Sohal
Brennan M. Tolnay
Zachary Mark Vogel
Ciara Michelle Witt

GAMMA IOTA

Travis James Bean
Alexander Jennings Clark
Mary Rose Evans
Yang Fei
Brian Daniel Grossman
Claire Elizabeth Hargrave
Reece Quinton Hoerle
Alan Huang
Edward Ehlers Jensen
Mehak Khokhar
Jaime Leigh Kraft
Rachel Lynn Lewis
Anika Lucie Marand
Robert Ames Needham
Rebecca Louise Pettit
Joseph Scott Powers
David Alberto Rivera
Nicholas Kyle Scyoc
Shaan Shiva Sharma
Andy Alexander Yanez
Christopher Charles Yoo

GAMMA NU

Jennifer Lynn Baker
Maryssa A. Beasley
Cameron William Bebb
Mary Grace Bouschard
Samuel Louis Cogen
Nicole M. Cordonnier
Paymon Doroodian
Anne Marie Esposito
Kelsey Anne Ewing
Jacob Isaac Fadel
Chani Marina Ferrell
Emma Rose Kessler
Jessica Marie King
Kayla Renae Kitchen
Emma Genevieve Lewis
Andrew Vincent Marinelli
Shadrick I.M. Paris
Conner William Parthemore
Danielle M. Powall
Stephanie Nicole Srembo
Nikki C. Streidl
Ethan Casey Whipp
Carley Melissa Whitton

GAMMA XI

Katherine Mandy Almasy
William Douglas Appleyard
Eric Wasson Burns
Allison Yun Corbo
Brian Hudson Darst
Ashley Nicole Gates
Sarah Elaine Harrill
Laura Catharina Kattilakoski
Catherine Minh-Thao Nguyen
Jacob Raymond Nelson
Alisha Anne Taylor
Bradley Seth Alexander Tull
Kelsey Marie Walz
Alissa Marie Ward
Kaitlyn Lee Williams
David Frazer Yeomans

GAMMA OMICRON

Jin Nam Ahn
Denise Beautreau
Anthony John Iacoviello
Garilania Alavarado Reyes
James E. Roberts
Chuyi Tang

GAMMA TAU

Justin Bryant
Breanna Dominguez
Allison Rabon
Nicole Robinson
Claire Smathers
Benjamin Wadsworth

GAMMA UPSILON

Allison Marie Baluarte
Danielle Bautista
Jie Chen
Edward Joseph Hilton
Kayla Mae Limani
Emma-Rae Amoretta Ranger
Natalie Senia

GAMMA PHI

Christopher Banker
Grace Tan
Gail Travis

GAMMA CHI

Jonathan Michael Bietsch
James DeWitt Marshal Campbell
Catherine Campos
Zachary Stuart Corcoran
Shelby Lynne-Frances Furman
Timothy Ethan McCoy
Jeffrey Arthur Pyster
Kelsey Morgan Trace
McKinley Worley
Andrew Yeagley

GAMMA PSI

Victoria Drago
Rebecca A. Groch
Batool Mehdi
Kevin M. Samson

GAMMA OMEGA

Nishat Anjum
Rachel Katherine Benigno
Reneelynn Faith Craft
Stephanie Lauren Dello Buono
Andrew M. Farahat
Jasmine Iman
Khiree A. Moore
Nina C. Morvin
Robin Marie Relosa
Alexandra Nicole Sarno
Gina Marie Sebastiano
Jacob Alexander Shusterman
Tationna Alyse Smalley
Eric T. Tompkins

DELTA ALPHA

Jean Bray
Nidhi Mehta
Sven Soderberg
Matthew Vieira

DELTA BETA

Darrion Deshun Bunch
Krystain Noel Coleman
Clare E. Davis-Wheeler
Bradly James Duhon
Jacenta Patrice Hinton
Draven Megan Howard
Adrianna Koren Lochner
Astrid Marilyn Manuel
Evan Jeffrey Melancon
Christopher Harvey Peterson

DELTA GAMMA

Danielle Grace Hendrix
Brandon Rashad Jones
Amber LeeAnn Ayanna Lott

BOSTON UNIVERSITY COLONY OF MU

Monideep Chakraborti
Valerie C. Gobao
Shana Hedvat
Neil Sullivan Mgaieth
Brittany Lalaine Mortera
Sonja Valeska Richter
Matthew Thomas Ruiz
Denise E. Stevens
Kaitlyn Victoria Vaccarelli

BETA MU COLONY OF BETA GAMMA

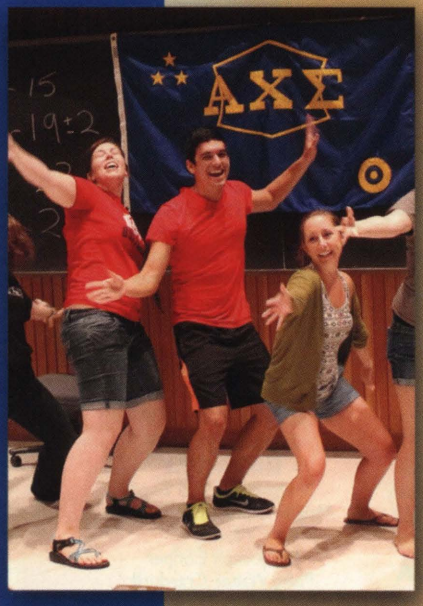
Robert Edward George
Mealani N. Kaiser
Taryn Nicole Ng
Ryan Cameron Niemeyer
Eduard Praiss Pey
Alexander Rand
Carlos Eduardo Razo
William Justice Reeves
Pablo Romano
Travis M. Wilson

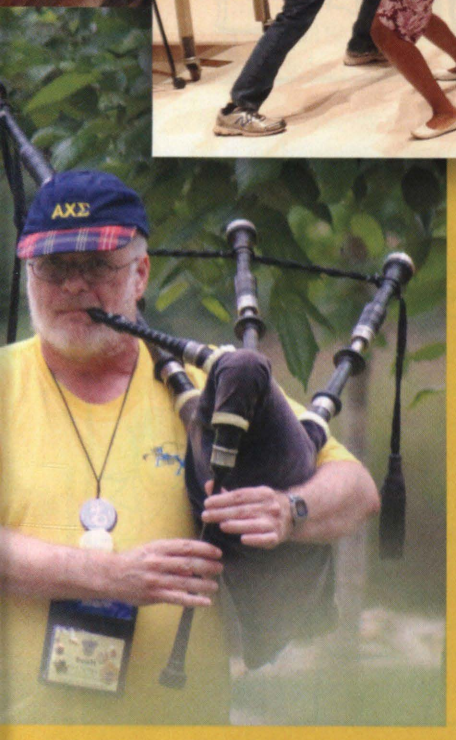
SOUTHEAST MISSOURI STATE UNIVERSITY COLONY OF BETA PSI

Benjamin Michael Boyd
Maigon Elizabeth Campbell-Nowlin
Joel Joseph Cooper
Philip Walter Crawford
Ryan William Gremard
Alexander James Grigsby
Ankita Hasija
William Wilder McNutt
Jacqulyn Teresa Miller
Emma Kristine Opp
Amanda Jo Sisk
Maxwell Wolfgang Stone
George Arthur Terry
Sean Michael Thomas

conclave preview

NEXT ISSUE: From July 27–August 1, 2014, the 52nd Biennial Conclave of Alpha Chi Sigma was held in Charlottesville, VA. In our next issue, we will feature the full report . . . but for now, enjoy this preview!



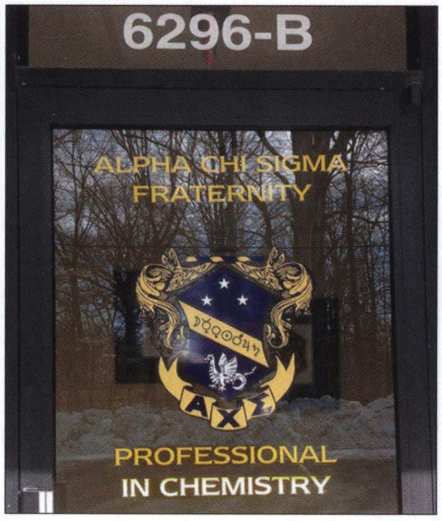


Bryan GIBB, *Nu 1999*, and **Jennifer (Stellke) GIBB**, *Nu 2001*, welcomed their first child, Jack Patrick Gibb, on March 14, 2014 (Pi Day!). Bryan is a postdoctoral fellow at Columbia University, and Jennifer is an emergency room doctor at Huntington Hospital.

Marji McNEILL, *Alpha Sigma 1988*; **Dr. James PALMER**, *Alpha Sigma 1990*; and **Brent STRATTON**, *Alpha Sigma 1990*, were inducted into the Arkansas Academy of Chemical Engineers. McNeill is employed by Koch Industries, Palmer is employed by Louisiana Tech University, and Stratton is employed by Valero Energy Company.

Marcene McVAY, M.D., F.A.A.P., *Alpha Sigma 1998*, is a pediatric general and thoracic surgeon at San Antonio Pediatric Surgery Associates.

Chapters and groups: Please send stories of events to *national@alphachisigma.org*. Don't forget photos, and be sure to include your contact information. **Alumni:** Have you had a recent promotion? Wrote a book? Started a new job? Added to your family? Discovered your coworker is a brother? Did brothers share an event with you, like your wedding day or retirement dinner? We want your news! Email your news to *national@alphachisigma.org*.



Reminder: Alpha Chi Sigma has moved!

The National Office moved to a new location last year. Please be sure to update your address book with our new address:

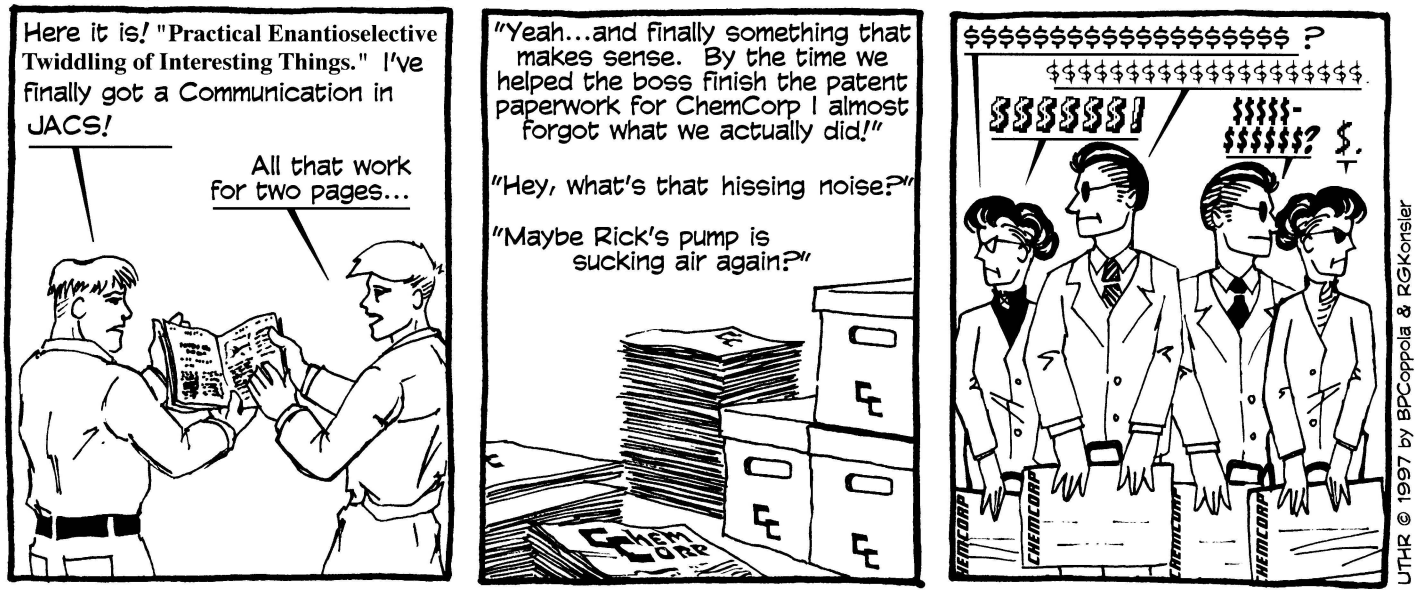
Alpha Chi Sigma National Office
6296 Rucker Road, Suite B
Indianapolis, IN 46220

Please send all correspondence to this new address. Thank you!

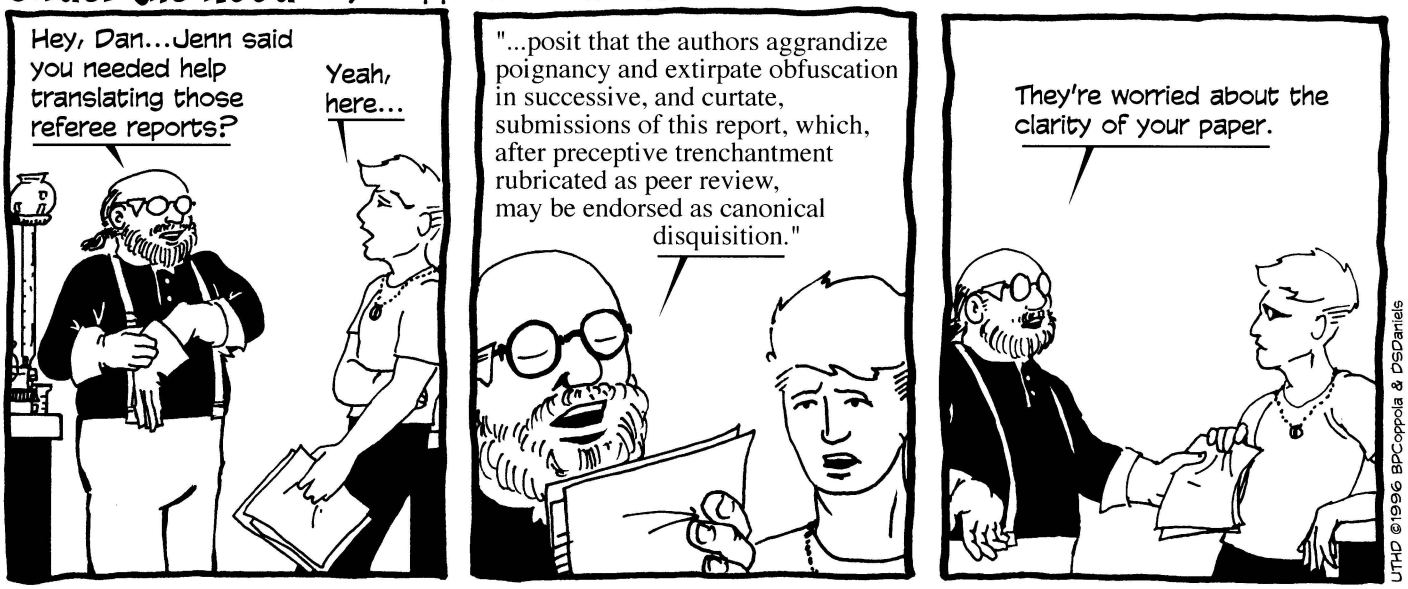
Brothers Lunch at the San Francisco ACS National Meeting

A group of 27 brothers and their guests attended the August 12, 2014, luncheon at the Fall Meeting of the American Chemical Society in San Francisco. Members attending: Eric Alexy, *Gamma Xi 2011*, Gary D. Anderson, OA, *Alpha Eta 1962*, Randall Binder, *Alpha Rho 2003*, Lucas Boron-Brenner, *Alpha Rho 2008*, Mark B. Fischer, *Sigma 1968*, Wiley Hall, *Alpha Rho 2000*, Alastair Herron, *Alpha Alpha 2013*, Amanda Lashua, *Pi 2010*, John Malin, *Delta 1977*, Sally Mitchell, *Pi 1980*, Sarah Mullen, *Gamma Zeta 2010*, Katie Murphy, *Alpha Alpha 2012*, Sean Pawlowski, *Gamma Upsilon 2006*, Niny Rao, *Gamma Beta 1999*, Nai Saephanh, *Alpha Alpha 2012*, Abraham Saldivar, *Tau 2012*, Linda Schultz, *Beta Eta 1972*, Shane Stone, *Pi 2013*, Cary Supalo, *Beta Nu 1997*, Rachel Morgan Theall, *Gamma Theta 1995*, Whitney Walker, *Alpha Alpha 2012*, and guests: Samone Fischer, Quan Kam, Mallory Kato, Nancy Malin, Christopher Theall, and Erica Yee.

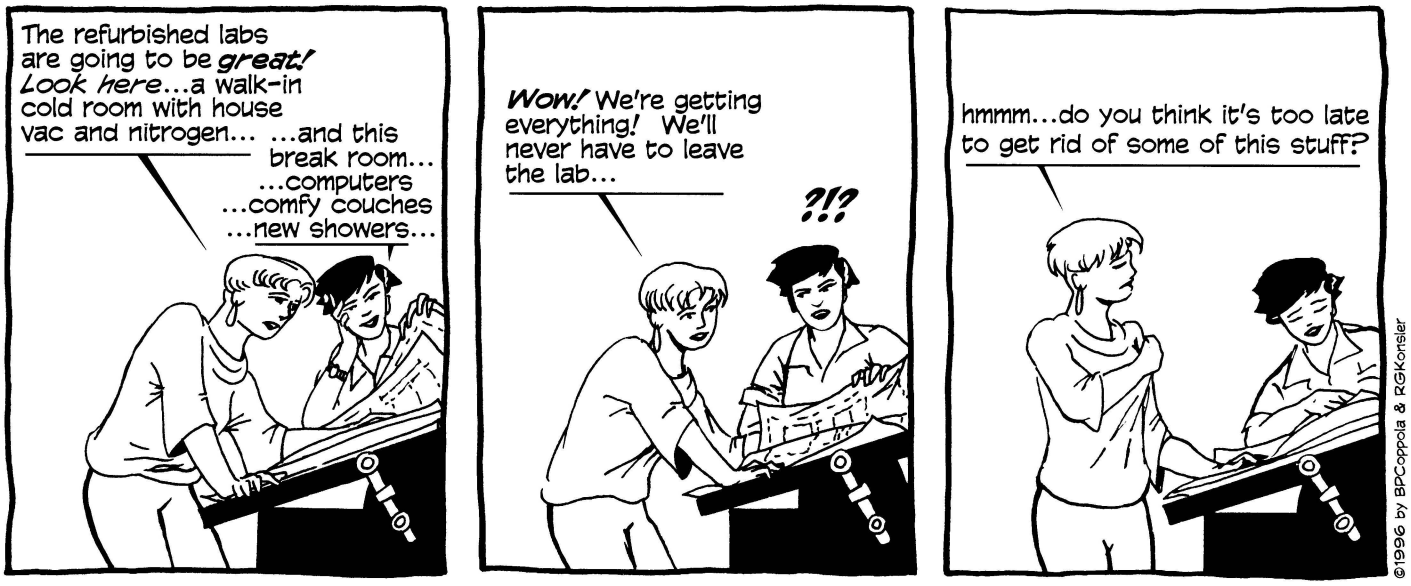
Under the Hood by Coppola & Konsler



Under the Hood by Coppola & Daniels



Under the Hood by Coppola & Konsler



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.

If you observe or suspect violation of the Fraternity's Risk Management Policy, you are encouraged to contact your District Counselor or any of the members of the Supreme Council whose names and contact information are provided on the back cover of every issue of *The HEXAGON of Alpha Chi Sigma*.

LOOKING BACK

100 years ago. . . Fall 1914

Brother Samuel Ross Wreath was killed on his 33rd birthday, heroically assisting in the rescue of two co-workers who had been overcome by hydrocyanic acid fumes. Brother Wreath was a charter member of *Zeta* Chapter and one of the founders of the Chicago Alumni Chapter. The two co-workers survived.

Frank Bachmann was appointed Grand Editor of *The HEXAGON,* replacing R. S. McBride, who had resigned.

Brothers J. E. Schunck and A. W. Hendrick were given a five-year subscription to *The HEXAGON* for composing the music and lyrics to "Alpha Chi Sigma Toast." The Supreme Council unanimously passed proposition 73, moved by the Grand Editor, "Shall we allow the Grand Editor to publish one page of puns or jokes as part of *The HEXAGON*? Many jokes along chemical lines are heard in the laboratory which would be of interest to *The HEXAGON* readers."

Tau Chapter moved into its new house at 505 Dryden Road in Ithaca. They held a house-warming smoker on October 17 for members of the Cornell faculty. There was a fine crowd in attendance, and between smokes, cards, apples, cider and doughnuts, the evening was a very pleasant one.

75 years ago. . . Fall 1939

The night before *Omicron* Chapter's (Harvard) Halloween party, there was a break-in at the fraternity house. Discovering the intruder, Brothers Davis and Nickle confronted the would-be burglar and after a "terrific struggle," a crime was prevented. After all the excitement, many of the brothers, unable to sleep, decided to start their party early. They raided the icebox and ran the record player at top volume. Somehow a small number of brothers slept through the whole thing and had to be given the details at breakfast the next morning.

Beta Chapter at Minnesota acquired a new mascot when a cat followed a few of the brothers home one evening. The cat, given the name "Beta," initially came and went as he (or she, the report doesn't specify a gender) pleased, but after much petting and daily bowls of cream, Beta decided he (or she) had found a new home. Beta sleeps both night and day among the objects in the Beta house's trophy case.

The *Alpha Theta* Chapter house at Iowa unveiled a newly redecorated recreation room. The room features new bridge tables, a phonograph and a radio

The Rhode Island members of Alpha Chi Sigma sponsored a luncheon during the fall meeting of the American Institute of Chemical Engineers. New England District Counselor R. K. Carleton served as MC for the session. The cost of a ticket was one dollar and the invitation assured everyone that yes, a real meal was included in the ticket price.

50 years ago. . . Fall 1964

The Supreme Council got together for a weekend at a St. Louis Holiday Inn. The majority of the meeting dealt with the mundane details of the biennial budget and investment review. Don Coyne was appointed Midwest District Counselor.

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

During the Alpha Chi Sigma banquet, at the fall meeting of the American Chemical Society, Dr. Reynold Fusion, professor emeritus from the University of Illinois, was presented with the John R. Kuebler Award. In 1921, Brother Fusion was initiated by *Sigma* Chapter at Cal-Berkeley, where he earned his master's degree. He received a Ph.D. from Minnesota in 1924 and did post-doc research at Harvard before joining the Illinois faculty in 1929.

The Fraternity was well represented in the administration of the Missouri School of Mines, home to *Beta Delta* Chapter. New appointments included *Beta Delta* initiates: Dr. Dudley Thompson '56 to the dean of faculty; Mailand Strunk '42 to chairman of the chemical engineering department and William Web '38 to chairman of the chemistry department. Brother Web was also District Counselor for the Missouri Valley District.

Alpha Beta Chapter at the University of Michigan renovated the chapter house with a completely remodeled exterior and interior renovations to the first and second floors.

Zeta Chapter at Illinois purchased a new television set for the house. With two televisions, the chapter organized an election night watch party that featured both sets tuned to different networks.

25 years ago. . . Fall 1989

Effective October 12, Alpha Chi Sigma could be reached toll free. Under a special promotion from AT&T, the Fraternity obtained a 1-800 number. Unsure of the value of a toll free line, the GMA had to convince the rest of the Council to give it a six-month trial. The number preferred by a majority of the Supreme Council (1-800-HEXAGON) was not available so GMA Levings got to pick the number he favored all along, 1-800-ALCHEMY.

At the November Supreme Council Meeting, a record balanced budget of $202,226 was adopted. Included in the budget was the creation of the Centennial Celebration Fund and a commitment to add money to the fund each year until 2002.

Another of the Fraternity's long-term visions involved moving membership records from an outside service to an in-house database. The Advanced Technology Committee, comprised of Chair DeWayne Gerber, Bennie Good and Gary Maddox, reviewed a number of options before recommending the purchase of FundMaster membership tracking software. The Supreme Council agreed to purchase the software on a trial basis, with FundMaster providing the required high performance personal computer, loaded up with a 386 processor, 640KB of RAM and a 150 MB hard drive. If FundMaster proved to be a better solution than the current method of outsourcing membership record processing to Data Science, the Fraternity would invest in a 386 class computer of its own.

10 years ago. . . Fall 2004

On September 25, a bronze plaque commemorating the founding of Alpha Chi Sigma was mounted in the main atrium of the Chemistry Building at the University of Wisconsin. The plaque was hung in the part of the building named for Farrington Daniels, a charter member of *Beta* Chapter at the University of Minnesota. At the dedication ceremony, the designer of the plaque, artist and *Alpha* Brother Mary Koffman, was presented with a vase of red carnations by GMA Gary Anderson. Also speaking at the dedication ceremony were GMC John Stipp, former Department Chair John Wright, and Alpha Chi Sigma Hall of Fame member Bassam Shakhashiri. After a wonderfully successful event in the Chemistry Building, more than 20 brothers adjourned to the Great Dane Pub for a celebratory luncheon. The dedication, luncheon and reception were all masterfully coordinated by *Alpha* Brother Cindy Koffman and supported by committee members Michelle Stengel, Cassy Splinter, and Rob Shereda.

The National Office, in Indianapolis, was the site of the 2004 North Central District Conclave, held during the first weekend in October. Around 75 brothers, representing nine chapters spanning three districts, listened as GMC John Stipp and District Counselor Jen Showerman gave State of the Fraternity updates. The group also participated in several workshops and a roundtable Q and A session with the Supreme Council. The highlight of the Conclave was on October 3, when a plaque was mounted on the National Office Building designating it the James F. Miller Building, honoring the former Grand Recorder and member of the Order of Altotus. Special guest speaker at the dedication was Pete Yochim. Brothers Yochim and Miller were both initiated by *Nu* Chapter. Although initiated 26 years after Jim, Pete's service to the Fraternity overlapped Jim's and Pete was able to share many of his own interactions with the former Grand Recorder while citing Jim's many contributions to the Fraternity.

The National Office underwent a leadership change as the Supreme Council appointed Patrick J. Johanns to the position of Grand Recorder, replacing Paul R. Jones. Brother Jones was named Grand Recorder Emeritus, recognizing his six biennia of service as the Fraternity's GR.

The number of Districts increased by two, making a total of 13. Pedro Muino was appointed District Counselor over the new Erie District covering parts of Ohio and Pennsylvania. After an absence of 18 years, the Northwestern District was recreated with John Terschak tapped to be the District Counselor.

H U Mo Ru S!

I was going to tell a joke about sodium, but . . . Na.

Argon walks into a bar. The bartender screams "Scram! We don't serve Noble Gases here!" Argon doesn't react.

Two scientists walk into the same bar. "I'll have an H_2O," says the first. "I'll have an H_2O, too," says the second. The second man dies.

A while later, Gold walks into the bar. The same testy bartender yells out "Ayyyy. . . . Youuuuu. . .! Get outta here!"

Chemists are never able to prank their friends because they lack the element of surprise.

You know, being an absolute zero is OK with me.

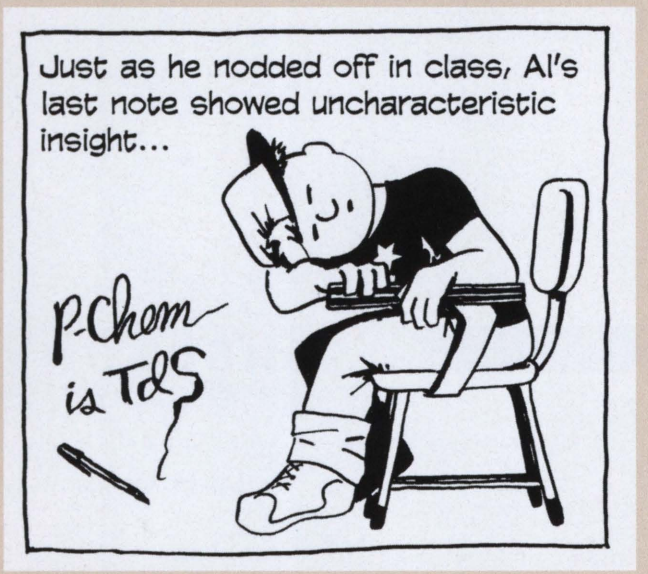
A neutrino walks through a bar. . .

A photon checks into a hotel. The clerk asks if he needs any help with luggage. The photon replies, "No, thanks. I'm travelling light."

Use chromosomes in your adverts because, you know, sex cells.

There are 10 kinds of people in this world: those who understand binary. . . and those who do not.

Don't trust atoms. . . they make up EVERYTHING.



The Matching Game

Another school year has begun, and this issue will probably hit right about the time of the first set of examinations for all of the collegiate brothers. Here is a matching test that can be used to warm up those brain cells for the real deal.

1. In which battle did Napoleon die? ___
2. Where was the Declaration of Independence signed? ___
3. River Ravi flows in which state? ___
4. What is the main reason for Divorce? ___
5. What is the main reason for Exams? ___
6. What can you never eat for Breakfast? ___
7. What looks like half an apple? ___
8. If you throw a red stone into the Blue Sea, what will it become? ___
9. How can a person go eight days without sleeping? ___
10. How can you lift an elephant with one hand? ___
11. If you had 3 apples and 4 oranges in one hand, and 3 oranges and 3 apples in the other hand, what would you have? ___
12. If it took eight men 10 hours to build a brick wall, how long would it take four men to build it? ___
13. How can you drop a raw egg onto a concrete floor without cracking it? ___

A. large hands
B. easy, sleep at night
C. the other half
D. marriage
E. the liquid state
F. his last one
G. just about any way, given that the concrete is hard to crack
H. never, because it would be really hard to find one
I. lunch & dinner
J. failure
K. on the bottom of the page
L. wet
M. none whatsoever, because it was already built

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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 ALPHA-Stanford University Stanford, CA

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 Univ. East Lansing, MI

ALPHA OMEGA-Georgia Institute of Tech Atlanta, GA

BETA GAMMA-Univ. of California-LA Los Angeles, CA

BETA DELTA-Missouri University 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 Tech. 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 State University San Luis Obispo, CA

GAMMA ETA-Marshall University Huntington, WV

GAMMA THETA-Truman State University Kirksville, MO

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GAMMA NU-Ohio University Athens, OH

GAMMA XI-North Carolina State Univ. Raleigh, NC

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