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the Bent of Tau Beta Pi
The Engineering Honor Society

Fall 2013
Vol. CIV / No. 4

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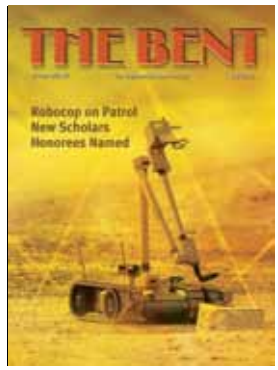
Features

ON THE COVER:

A military robot checks out a potential bomb in Iraq. Alan S. Brown looks at how technology is changing the face of law enforcement.

Colleen L. Hill-Stramsak describes how the Mackinac Bridge came about to unite a physically divided state.

Cover artist: Dali Polivka



Reports

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COUNCIL'S CORNER

The Tau Beta Pi Association was founded at Lehigh University in 1885 by Edward Higginson Williams Jr. to mark in a fitting manner those who have conferred honor upon their Alma Mater by distinguished scholarship and exemplary character as students in engineering, or by their attainments as alumni in the field of engineering, and to foster a spirit of liberal culture in engineering colleges. —Preamble to the Constitution

How to Stay Involved

Science fiction is a ladle that stirs the simmering stew of ingenuity. I love *Star Trek* with Gene Roddenberry's vision of future society and space travel. I've also grown to admire author Philip K. Dick. His works are the basis for blockbuster films like *Blade Runner*, *Minority Report*, *The Adjustment Bureau*, and *Total Recall*.

For me, it's astounding that both Roddenberry and Dick imagined the future when they lived in an era where corded dial telephones were a necessity for travel. Their creative ability to envision, with little present-day clues to the future's potential, is a prime example of mental ingenuity. It's easier now to see the communication technology potential with our increasingly powerful pocket smartphones.

The smartphone, like the writings of science fiction, can inspire visions for ingenuity. I personally await the smartphone app which sends out a laser beam to point and sweep clean any area of dust, soap scum, mildew, and germs. TBΠ will also develop apps to assist the needs of student and alumni members. Yet apps don't quite answer all our questions (sorry, Siri). We still need the "human" resources for a successful Association.

Supporting Alumni

So it was with great excitement that I took part in the process to select another "human" resource for TBΠ. The Director of Alumni Affairs (DoAA) selection committee reviewed the resumes of three excellent applicants, followed by individual interviews.

Tricia Gomulinski, a former District 12 Director, former member of the Front Range Alumni Chapter, and current member of the Great Smoky Mountains Alumni Chapter, is our first DoAA since 1978.

Tau Beta Pi's concerted effort to devote more attention to our alumni starts with the Director of Alumni Affairs. To quote President Larry Simonson's Summer 2013 Council's Corner, there is a time gap expressed commonly by alumni as "This is the first time I've heard from or been invited to a Tau Beta Pi event since I graduated."

The DoAA position will help close this gap. I've already worked with Tricia in the re-emergence of the Central Florida Alumni Chapter with a speed networking event aimed at assisting engineering students' skills for networking with alumni. Tricia is ready and eager to assist any alumni wishing to install or re-ignite an Alumni Chapter.

My smile spreads as I imagine the future where the DoAA is, to you, as handy as a smartphone in delivering assistance and answers. I confess I hold a tiny pinky finger grasp on the myriad of functions available to my Android. I mainly find cool apps from friends touting "look at what this does."

Ergo, in the spirit of "look at what this does," here's my quick reference list of amazing things the DoAA can do to assist any member or chapter:

- Want to find TBΠ alumni in your area?
- Need help contacting or starting an Alumni Chapter?
- Want to get more involved with a student chapter?
- Wish to offer your talents to help Tau Bate students?
- Want to attend a local initiation ceremony?

Email the DoAA at *Tricia@tbp.org* for help or answers.

Unique Benefit

Another valuable tool for students and alumni, that is often overlooked, is our annual Convention. This year's Convention, hosted by Iowa Alpha in Ames, will have a schedule heavily based on leadership programs. The goal is to make the event a productive and enhancing experience for alumni as well as the students.

We have esteemed alumni coming to Ames for special presentations such as giving the ever important elevator speech, ethical reasoning, and engineering your career identity. These interactive learning sessions are a unique benefit to our members.

The Convention experience is not yet available in an app (perhaps in the future per *Total Recall* or its companion book *We Can Remember It For You Wholesale)*. Convention is also a massive networking opportunity—400 members convene from across our planet.

Tau Beta Pi's goal is to evolve and engage your interest in activities for a lifetime. Try our new alumni involvement features, and give us ideas for new offerings. We are eager to develop and evolve for you!

—Solange C. Dao, P.E.,
Florida Alpha '95, Vice President

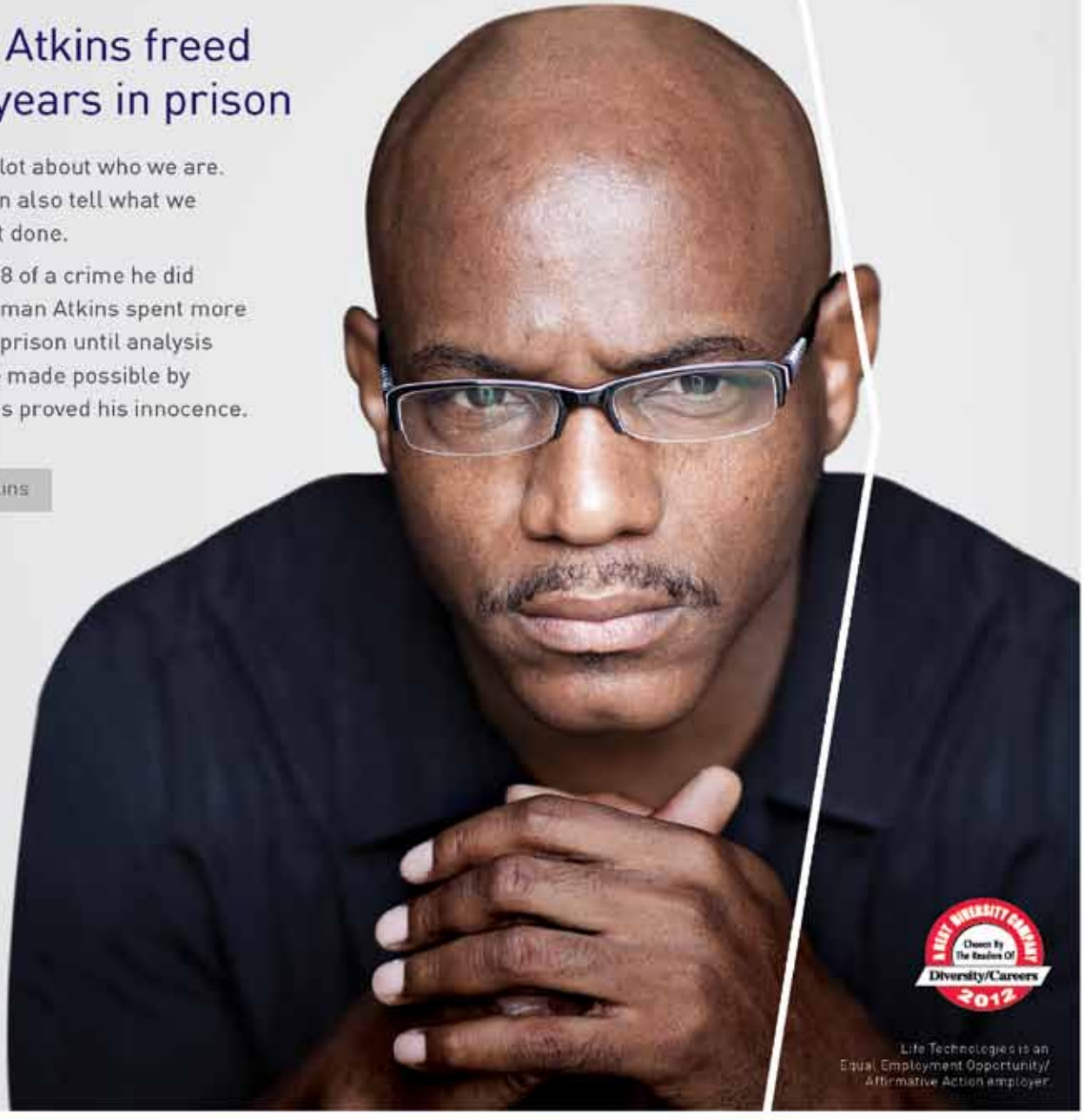
ADVANCING:
JUSTICE

Herman Atkins freed after 11 years in prison

Our DNA says a lot about who we are. Sometimes it can also tell what we have—or haven't done.

Convicted in 1988 of a crime he did not commit, Herman Atkins spent more than 11 years in prison until analysis of DNA evidence made possible by Life Technologies proved his innocence.

Herman Atkins



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EDITORIAL

Swaying in the Straits

Before moving to Knoxville, I used to visit the area and the Smoky Mountains once or twice a year. My aunt, uncle, and cousins have lived in Knoxville for over 25 years, and several Tau Bates and I regularly vacationed in the mountains. We would hike the many trails in the Smokies—even ascending Mt. LeConte twice in the past decade. Since moving to Knoxville, I have rarely had an opportunity to make it to the mountains for a hike. Sadly, I have found that you tend to overlook the wonderful opportunities in your own backyard.

During my years as a Michigan resident, I visited many of its high points including Henry Ford Museum and Greenfield Village, the Detroit Institute of Arts, Mackinac Island, and the Soo Locks—to name a few. However, as I look at Michigan from a tourist's perspective, I realize that I missed a number of worthwhile attractions and activities while a resident. For example, each Labor Day, the Mackinac Bridge, which connects the Upper and Lower Peninsulas of Michigan, is open to pedestrians. Although not something necessarily on my "bucket list," I decided it was time to experience the bridge walk *(See Colleen Hill-Stramsak's article on page 22 for more on the Mackinac Bridge).*

My wife and my mom joined me in the five mile journey above the Straits of Mackinac along with 33,000 other walkers. We arrived just before sunrise on Labor Day dressed in our hoodies in anticipation of the 55 degree temperature and 20 mile per hour winds whipping across Lakes Huron and Michigan. Shortly after 7 a.m., we joined the throng of walkers following Michigan Governor Rick Snyder across the bridge. Although the skies were overcast, the rain held off while we crossed; those who started after us only had to contend with a slight drizzle.

As we neared the middle of the bridge, I noticed that my feet weren't landing where I expected them to land. Several of my fellow walkers quickly explained that the winds had picked up and "the bridge was swaying." I've traveled across the bridge numerous times, but you miss the "swaying" experience when crossing in a car! As I looked at the roadway, main cables, and towers, I could visibly detect the swaying of the bridge that my inner ear had detected earlier. It certainly made the next few minutes of the walk more interesting, and I reminded myself that swaying is part of a well-engineered bridge.

We set no record pace at 1 hour and 40 minutes, but it felt good to look north from Mackinaw City and see the bridge behind us. If you are up for a unique experience, I strongly recommend the annual Mackinac Bridge Walk. However, it is not for people who have issues with heights, water, or motion sickness.

Take time to visit some of the attractions in your own backyard before they become tourist attractions on your future visit to the area. For me, it's time to put on my hiking boots and get back to the Smokies.

Until Later,

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David D. Awschalom, Ph.D., *Illinois Alpha '78,* has been elected to the European Academy of Sciences. He is professor in molecular engineering at the University of Chicago and is known around the world for his research in spintronics and quantum information science. Spintronics specialists manipulate the spin of electrons and nuclei to devise new methods for advanced computing, medical imaging, subatomic memories, encryption and other technologies.

Shafrira Goldwasser, *Pennsylvania Gamma '79,* was the 2013 co-recipient of the Association of Computing Machinery A.M. Turing Award. She is professor of computer science and artificial intelligence at the Massachusetts Institute of Technology and Israel's Weizmann Institute of Science. Goldwasser was honored, with MIT colleague Silvio Micali, for her work that laid the complexity-theoretic foundations for cryptography, and pioneered new methods for verifying mathematical proofs in complexity theory.

Academy of Arts and Sciences
The American Academy of Arts and Sciences has announced the election of 198 new members, who include five Tau Bates:
•**Lawrence D. Brown,** Ph.D., *CA B '61*—University of Pennsylvania Wharton School, mathematics, applied mathematics and statistics.
•**Naomi E. Leonard,** Ph.D., *NJ Δ '85*—Princeton University, engineering sciences and technologies.
•**Kenneth C. Macdonald,** Ph.D., *CA A '70*—University of California, Santa Barbara, astronomy (including astrophysics) and earth sciences.
•**Jennifer L. Rexford,** Ph.D. *NJ Δ '91*—Princeton University, computer sciences (including artificial intelligence and information technologies.
•**Sheldon Weinbaum,** Ph.D., *NY Γ '59*—City College, City University of New York, engineering sciences and technologies.

Lt. Col. Byron K. Lichtenberg, Sc.D., *Rhode Island Alpha, '69,* is to be a visiting scholar at LeTourneau University, where the former astronaut will teach freshmen and sophomore engineering classes. The former USAF fighter pilot flew aboard two NASA Space Shuttle missions as a payload specialist. He was a founder of Payload Systems, Inc., that provided hardware and flight support for experiments on the Space Shuttle and International Space Station and was also the first commercial user of the Mir Space Station, with protein crystal growth experiments.

Steven J. Zinkle, Ph.D., *Wisconsin Alpha '80,* of the Department of Energy's Oak Ridge National Laboratory has been named a 2013 Fellow of the Materials Research Society (MRS). He is acknowledged for his pioneering contributions to the understanding of radiation effects in materials. Zinkle is chief scientist for the ORNL Nuclear Science & Engineering Directorate.

Anand Veeravagu, M.D., *Maryland Alpha '05,* is a White House Fellow. He was a neurosurgeon in training at Stanford University school of medicine, previously serving as chief neurosurgery resident at the Palo Alto Veterans Affairs Hospital caring for soldiers returning from Afghanistan with brain and spinal cord injuries. Anand is focused on minimally invasive diagnostic and surgical techniques for the central nervous system.

Paul H. Gross, *Michigan Gamma '83,* was awarded his sixth Emmy by the National Association of Television Arts and Sciences Michigan Chapter. He was recognized for regularly adding science and environmental stories to his weathercasts. Gross recently celebrated his 30th year as a meteorologist at WDIV-TV in Detroit. He also consults as an expert witness.

National Inventors Hall of Fame
There were four Tau Bates among the 11 inductees for 2013 into the National Inventors Hall of Fame:
•**Donald L. Bitzer,** Ph.D., *IL A '55,* who helped create the first plasma display.
•**Irwin M. Jacobs,** Sc.D., *NY Δ '56,* and **Andrew J. Viterbi,** Ph.D., *MA B '57,* major contributors to code division multiple access (CDMA) technology that is used in cellphone networks.
•**Robert A. Moog,** Ph.D., *NY A '57,* whose synthesizer helped revolutionize the face of music, giving artists and composers the capability to create a brand new palette of sounds.

LETTERS

Fracking Report

• Just read Trudy Bell's shale gas recovery article.

One thing I missed seeing was the concern I've heard from some fracking critics about methane leakage. They claim that many wells leak a significant percentage of the methane they extract, thereby cancelling the greenhouse-gas benefits of burning methane over other fossil fuels, since methane itself is a much more powerful greenhouse gas than CO^2.

Did you run across any leakage stats in your research?

Overall, a very good article.

Warren H. Jessop, NJ Γ'63

[*Trudy E. Bell writes: Your perceptive question gets to the heart of the crucial issue as to whether natural gas is overall a cleaner (i.e., lower carbon) fossil fuel than coal, because methane (CH_4) is a greenhouse gas 21 times more powerful than carbon dioxide ($CO2$).*

The true impact of a technology should be measured over the full life cycle—i.e., not only utility or consumer use, but also including extraction and pipeline transmission. While there seems to be general agreement that the fugitive methane emissions from hydraulic fracturing are higher than those from conventional drilling for oil or gas, the challenge seems to be getting definitive numbers as to just how high.

Reputable bodies disagree. Researchers at Cornell University in 2011 and 2012 and the National Oceanic and Atmospheric Administration (NOAA) in 2012 reported measurements in peer-reviewed journals that suggested emissions were great enough to vitiate any benefit of natural gas over coal, but also possibly accelerate the release of greenhouse gases. Researchers at the Massachusetts Institute of Technology in 2012 and the Environmental Protection Agency in 2013 reported much lower results.

What is clearly needed is some expert body to review all the reports, comparing such parameters as emissions measurement techniques, the specific oil and gas fields measured, and even the equipment at different wells.]

• Thank you for Trudy Bell's comprehensive, balanced and extremely well-written article in the Summer 2013 issue of The Bent.

I hope that the results of your work will grace the pages of other publications to broaden the base of understanding of this important strategic and environmental issue beyond the circle of Tau Bates.

Ian G. Durand, NJ Γ'58

• Enjoyed the fracking article by Trudy Bell. Another great article! Thanks and Congratulations.

We have some property in Colorado and have been pestered about allowing drilling. We have declined because we value the land and don't want to see it spoiled. We are concerned that we'd be left with something like the center picture on page 23—and maybe the drilling company would cease operations and leave the mess for us.

We are also concerned about the huge amount of water required and then the disposal of the "produced water." Your article reinforces our convictions on this.

Walter S. Ciciora, Ph.D., IL B'64

Stephan Articles

• I was initiated into "Tau Bate" (as everyone said back then) in 1949 at then Clarkson College's Theta chapter. I've come a long way since then and don't read much of The Bent but now and then something catches my eye, as was the case with Ms. Stephan's articles. So I have to express a few thoughts.

I went to public schools in the thirties and forties and was drafted into the Army in 1944 (I had to apply for a deferment to finish high school). Everyone knew the term "Phi Beta Kappa" back then and looked in awe if someone was a member. It was an "honor". Few, if any, had heard of Tau Beta Pi, at least not me. I always had good grades, so getting into college on the G.I. Bill was not difficult. I knew little of Clarkson, but they were the first to accept me.

Since it was all engineering in those days, mechanical, civil, chemical, and electrical (Clarkson did offer a course in Business Administration, but the accepted reason for that was it was there in case one flunked engineering), ΤΒΠ was well known and in my case the Phi Beta Kappa of engineering.

It was an honor to be eligible and elected to Tau Bate. I don't know the statistics, but I knew of no one who was eligible in my class who didn't accept. We were extremely proud during initiation week to wear a sash in ΤΒΠ colors. It meant something to be known as of sufficient scholarly ability to be a Tau Bate.

Flashing forward sixty years, the world and everything in it is thought of much differently. Almost anyone can go to "college" today and from what I see, what many of them learn isn't very evident. "Honor" in all its forms (not limited to scholastic ability) is almost non-existent. So "who needs Tau Beta Pi?"

There is a very different mindset today about life in general, and things like honor are now limited to the 14 percent that Ms. Stephan's statistics show will be initiated. The rest of the eligibles, though worthy enough, just don't care.

Someplace in the article the words "benefits of joining" appear. And that kind of sums up today's world. "If I can't get some tangible benefit from this, I don't need it." "What's in it for me?" All of Ms. Stephan's thoughts may get 14 percent to 15 percent, but I don't see the world changing back to one of morals and honor the way I knew it in the rest of my lifetime. I've always been as optimist (under all this horse manure there must be a

pony someplace!), but it's a different world. Thanks for reading this.

Harry J. Schmidt, NY Θ '50

Thank You

• Thank you very much for your very generous Tau Beta Pi scholarship award. I greatly appreciate your initiative to aid individuals like myself. I am truly humbled and honored.

I am studying computer engineering at Northeastern University. I have been involved in research in GPU and parallel computing at Northeastern University under the supervision of Professor David Kaeli.

The award money means a lot to me as it will help me pay for college. I shall honor it with success and achievement at Northeastern University.

Your support will go a long way in achieving my educational and career goals. Once again, your generosity is appreciated and I shall keep in touch to let you know of my progress.

Neel P. Shah, MA E '15

• I would just like to send a huge thank you your way for the opportunity to receive such a prestigious Tau Beta Pi Scholarship. I am incredibly grateful to have received this award. Because I am paying my own way through school, it will help immensely. Thanks again.

Alexa J. LaQua, ND B '15

• I would like to express my gratitude for my selection as a recipient of a Tau Beta Pi Scholarship for the 2013-14 school year. This award will be a great financial asset to assist me as I finish my last year as a mechanical engineering undergraduate and then pursue graduate studies. Thank you and the Fellowship Board.

Justin K. Vrabel, OH Λ '14

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The Tau Beta Pi Outstanding Advisor has been recognized every year since 1994. Selection is made by a national committee of deans of engineering colleges.

2013 OUTSTANDING ADVISOR

Bruce L. Walcott, Ph.D.

In recognition of service to his chapter and the Association, **Bruce L. Walcott,** Ph.D., *Indiana Alpha '81*, is named the 2013 Tau Beta Pi Outstanding Advisor. A professor of electrical and computer engineering at the University of Kentucky, he is Chief Advisor to Kentucky Alpha Chapter.

Walcott was cited in his nomination for promoting the mission of the Association, supporting its members at all levels, and offering guidance and leadership to develop exemplary engineering professionals capable of contributing to society.

Walcott received his bachelor's, master's, and Ph.D. degrees in electrical engineering from Purdue University. He joined the engineering department at UK in 1987 as an assistant professor.

Since 1999, Walcott has served as an associate dean of the college of engineering and was named as the first ever alumni professor at UK's college of engineering. His area of research focuses on the observation and control of nonlinear systems, variable structure control of flexible systems, and intelligent identification and control via neural networks. He is also president and co-founder of Infinite Horizon, LLC.

He has been Chief Advisor to KY A for 15 years and was instrumental in encouraging the chapter's winning bid to host the 107th annual TBΠ Convention. He worked tirelessly behind the scenes to help in preparations, company recruitment, and even technical issues with projectors. During the Convention he would arrive first each day and not leave before the last volunteer.

On the UK campus, he is also a key figure in recruiting new members and has plenty of fun stories to share with them. Not only has Walcott helped increase the number of active members, he has also created a sense of continuity within the chapter by starting a retreat at the end of each school year where current officers pass off important information to incoming officers.

Walcott is known as a dedicated educator evidenced by his receipt of 17 professional and teaching awards, including the University Student Organization 2012 Advisor of the Year. He also makes time to be active in other campus activities. He is founder and director of the new UK Center for Visualization and Virtual Environments. He is largely involved with energy initiatives as he started the UK solar car team in 1998, and his newest endeavor is working on a design team to bring a net-zero building to campus. He also encourages an entrepreneurial spirit as the advisor of Big Blue Starters, founded to show students how to begin a startup company.

Walcott is a staunch supporter of K-12 STEM efforts. He has developed a UK engineering summer program and helps run a FIRST LEGO League for 4th to 9th graders. His efforts have allowed the KY A Chapter to get involved, introducing middle school students to binary, hosting a robot display, and volunteering at the student technology leadership program state competition.

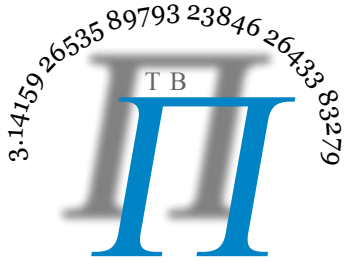
The chapter's nomination stated: "Despite all of his commitments to both student organizations and teaching, Dr. Walcott somehow manages to be accessible any time we need him. In fact, all of Dr. Walcott's other roles across campus have only helped strengthen the KY A Chapter by allowing us to work with other organizations."

In recognition of his commitment to the student chapter and the Association, as a role model and mentor to his students, and his efforts to support the professional development of young engineers, Tau Beta Pi hereby recognizes Bruce L. Walcott as the 2013 Tau Beta Pi Outstanding Advisor.

PI DAY 2014

The Association is encouraging all members to take part in Tau Beta Pi related activities on Pi Day, Friday, March 14, 2014. This new initiative includes members proudly wearing their TBP apparel or insignia.

There will be a design contest in November for a Pi Day logo that will be printed on shirts and hoodies. The winning design will be chosen in December, advanced orders placed in January, and delivered in February.



Tau Beta Pi Day

Collegiate and alumni chapters should plan to host events on March 14. Ideas include, social gatherings, community service projects, and K-12 related activities such as MindSET.

Tau Beta Pi requests pictures and details of all activities to publish in The Bent and online. Plan on joining in on the excitement of this inaugural celebration to promote the Public Image of the Engineering Honor Society!

BOOKKEEPING

After 29 years of serving The Tau Beta Pi Association as bookkeeper, Betty Harless retired on August 9. A search for a new bookkeeper took place in June and July. During that time, Christopher R. Salvo, *TN A '14*, served as interim bookkeeper. Michael A. Brown joined the Headquarters staff as the new bookkeeper on August 1. Thank you to Betty for your years of service to the organization, and best wishes for your retirement. Thank you to Chris for helping during the transition. Welcome, Mike, to ΤΒΠ!

Mike Brown, Chris Salvo, and Betty Harless with the tools, ancient and modern, of the bookkeeping trade.

Established in 2006, the Tau Beta Pi-McDonald Mentor Award celebrates excellence in mentoring and advising among educators and engineers who have consistently supported the personal and professional development of their students and colleagues. It recognizes those who have shown true concern for individuals, supported an environment for developing talents, and earned respect and recognition for their contributions to their field and the greater community.

2013 ΤΒΠ-MCDONALD MENTOR

Lt. Col. Donald W. Rhymer, Ph.D.

For his outstanding success in mentoring engineering students, **Lt. Col. Donald W. Rhymer,** Ph.D., *Colorado Zeta '94*, is the 2013 ΤΒΠ-McDonald Mentor. He is professor and department head of engineering mechanics at the United States Air Force Academy (USAFA).

A tireless advisor, Lt. Col. Rhymer was endorsed for going beyond the call of duty in developing and mentoring engineering students. He has demonstrated a commitment to his cadets, his institution, and the local community that deserve the utmost recognition.

Lt. Col. Rhymer received his B.S. in engineering mechanics from the USAFA and a Ph.D. in mechanical engineering from the Georgia Institute of Technology. He completed his Ph.D. in 2005 with a dissertation in modeling high temperature fracture and fatigue for turbine engine applications, which has been lauded by Pratt & Whitney for aiding in the development of engine technology for the Joint Strike Fighter.

He has been an instructor in the engineering mechanics department at USAFA for more than six years. In 2010, he became the deputy for the mechanical engineering curriculum.

As department head, Lt. Col. Rhymer oversees 34 faculty teaching 26 courses, two academic majors, and over 2,800 cadets annually. He is responsible for planning, curriculum, teaching, assessment, accreditation, research, personnel, and budget as well as managing $35M in aircraft sustainability research through the center for aircraft structural life extension.

During the past three years, he started each class by motivating cadets about leadership and officership. He has also become a popular choice for speaking engagements and was recently asked to fill in as a guest speaker for an annual banquet for the senior class, when the original speaker cancelled on the morning of the event.

Lt. Col. Rhymer advised 24 cadets during the recent academic year, including a Rhodes Scholar. In addition, he leads a council of cadets majoring in mechanical engineering to foster a direct means of student assessment and feedback.

Outside the classroom, he mentors cadets in professional growth, as the officer in charge for a religious education club, and has furthered the ideals of Tau Beta Pi by fostering a spirit of liberal culture among the cadets as the officer in charge of the highly visible Falconry Club, representing the Air Force Academy at various public events. He also remains active in the community, serving as a Sunday school teacher for Forestgate Presbyterian Church.

His devotion to his profession has been recognized with two recent teaching awards. Lt. Col. Rhymer was named the Outstanding USAFA educator and the DFEM instructor of the year for the department of engineering mechanics. This year, the Colorado Zeta Chapter of ΤΒΠ chose him as Instructor of the Year.

Lt. Col. Rhymer recently received one of the highest honors for any officer at the academy when he was requested by name to commission three cadets from the graduation class.

The chapter voted to nominate Lt. Col. Rhymer and cited his "consistent outstanding support to the personal and professional development of his students and fellow faculty, and as a consummate academic advisor and mentor."

Lt. Col. Rhymer's enthusiastic commitment has made him a leader and role model among his peers. For these contributions as a trusted advisor and for providing unselfish service contributing to the development of future leaders, Lt. Col. Donald W. Rhymer, Ph.D., is the 2013 Tau Beta Pi McDonald Mentor.

Distinguished Alumni are recognized for their demonstration of outstanding adherence to the ideals of Tau Beta Pi (integrity, breadth of interest, adaptability, and unselfish activity) and for fostering a spirit of liberal culture in society. Recipients exemplify excellence in both leadership and character to members of collegiate chapters.

2013 DISTINGUISHED ALUMNUS

M. Lucius Walker Jr., Ph.D., P.E.

In recognition of outstanding lifetime achievements, **M. Lucius Walker Jr.,** Ph.D., P.E., *District of Columbia Alpha '57*, is recognized posthumously as the 2013 ΤΒΠ Distinguished Alumnus. He was a professor emeritus of mechanical engineering and former dean of Howard University's engineering school.

Dr. Walker's selection as 2013 Distinguished Alumnus recognizes his lifetime achievements and commitment to engineering education.

At age 15, Walker attended Morehouse College on a Ford Foundation scholarship. He transferred to Howard and earned his bachelor's degree in mechanical engineering, as the engineering school's first summa cum laude graduate. He went on to receive a master's and Ph.D. from Carnegie Mellon University.

M.L. Walker taught mechanical engineering for 44 years at Howard and served as an associate professor, a professor, as chair of the department, and as acting dean, from 1975-1977 and then dean, 1978-95, before retiring in 2002. His academic specialties include engineering economics and the applications of computers.

As dean he supported ΤΒΠ and other honor and professional societies, vigorously promoted the inclusion of humanities and science courses in the engineering curricula, and championed a technical and liberal education through extracurricular activities. He always encouraged student athletes to excel on and off the playing field. Under his tutelage, several student athletes and other engineering alumni distinguished themselves outside of engineering.

He was also a proponent of writing and his attitude led the *Howard Engineer* magazine to garner many national awards. Dr. Walker also supported liberal culture through facilitating student visits to soup kitchens and to local K-12 schools to educate young students about the role of science and engineering in their daily lives.

At Howard, he co-founded two scholastic organizations that worked to increase the number of minority students in engineering. Dr. Walker was a co-founder and directed the Engineering Coalition of Schools for Excellence in Education and Leadership, an NSF-sponsored coalition of engineering schools at seven major universities. He also co-founded the Advancing Minorities Interest in Engineering organization in 1991.

His concern for the human condition, and the need for compassionate engineers, extended beyond the campus to national and international locations. He was instrumental in supporting Howard's collaborative, interdisciplinary Republic of South Africa Project, which sent student teams to South Africa to help local universities and advance living conditions.

Dr. Walker was the recipient of two notable awards: the 1988 black engineer of the year award from *U.S. Black Engineer and Information Technology* magazine and Howard's distinguished alumni achievement award in 2008. In addition, Dr. Walker sat on the board of directors at Carnegie Mellon University, the nonprofit group Junior Engineering Technical Society, and the Center for Naval Analyses, a military-affiliated think tank.

He was initiated with the first class of DC Alpha Chapter members in 1956. His other affiliations included the Kappa Alpha Psi fraternity and Pi Mu Epsilon, honorary national mathematics society.

In his nomination prepared by DC Alpha and **Peter Keiller, Ph.D.,** *DC A '72,* Dr. Walker was cited for "insisting that understanding human challenges, relationships and values and the role of knowledge capital are important foundations for a young person's future."

Dr. Walker passed away in June 2013. He had two children and six grandchildren.

2013 LAUREATES

Five Laureates have been selected in the 32nd year of Tau Beta Pi's annual program to recognize gifted engineering students who have excelled in non-technical areas. Award categories include arts, athletics, diverse achievements, and service. The Laureates join 84 other outstanding Tau Bates who have been cited since the program began in 1982. They will be honored during ceremonies on November 2, 2013, at the 108th annual Convention in Ames, IA, where they will each receive a $2,500 check and a commemorative plaque.

The Laureate Program was inaugurated to further Tau Beta Pi's second basic purpose as stated in the preamble to the Constitution: "to foster a spirit of liberal culture in engineering colleges." A committee of District Directors considered 15 nominees from 13 chapters.

Michael R. Lacey

MICHAEL R. LACEY, *South Carolina Gamma '13*, has been named a 2013 Tau Beta Pi Laureate for his diverse achievements. He graduated with a B.S. degree in electrical engineering and a B.A. degree in political science from The Citadel.

As a Naval STA-21 officer candidate, Michael was given three years to complete his undergraduate degrees.

Making the most of his time, he has become a performer, teacher, and leader. He is an award-winning ballroom dancer and a performer as part of an improvisational comedy group in Charleston, SC.

Michael served for a year as the director of the unit sailing program and created a competitive sailing team for the NROTC unit. In addition, he undertook the responsibilities of planning the first regatta hosted by The Citadel in more than 30 years.

Michael served as vice president of the South Carolina Gamma Chapter of ΤΒΠ and was instrumental in community service activities and chapter growth during the past year.

He is also the first active duty student at The Citadel to receive the Star of West Study Abroad Fellowship. His leadership potential was summarized in a recommendation letter, "other cadets (here) look to him for advice and guidance in their academic studies as well as their future careers."

Darick W. LaSelle

DARICK W. LaSELLE, *Colorado Epsilon '13*, has been named a 2013 Tau Beta Pi Laureate for his achievements in service. He is an electrical engineering graduate of the University of Colorado at Denver.

Darick was nominated for his service contributions in the Autism community and his leadership for the Colorado Epsilon Chapter as a two-year chapter president.

Darick has three sons, one that has been diagnosed with classic autism.

He began volunteering at the school where his son was enrolled, but "it was when I first read about (ΤΒΠ) MindSET that I really consciously knew where I fit." Since that time, Darick's service with the Association and the autistic community has been inexorably linked. He has already held an eight-week MindSET-style program with five autistic teenagers.

He has also been an invaluable member of the Colorado Epsilon Chapter. Before he became chapter president, there were five active undergraduate members and one advisor. Today as he leaves, there are more than 60 members and six advisors. In addition, Darick has led his chapter to two Secretary's Commendations and two District regional awards, and his chapter hosted the 2013 District 12 Conference.

His contributions and dedication to service are characterized as an inspiration to the nominating chapter and his school.

Benjamin B. Macy

BENJAMIN B. MACY, *Indiana Delta '13*, has been named a 2013 Tau Beta Pi Laureate for his achievements in service. He graduated from Valparaiso University with a degree in electrical engineering.

From an early age, Ben has been dedicated to his education and working to benefit others. This joint focus continued through his undergraduate studies where he has performed nearly 330 hours of community service. His hard work has developed him into a leader as well. This past year he was elected at Valpo as the student body president and the President of the Indiana Delta Chapter of ΤΒΠ. Under his guidance, the chapter has become more active, including raising money and participating with the local Habitat for Humanity.

Ben is also involved on campus as a tutor, a member of IEEE, Sigma Phi Epsilon fraternity, and Alpha Lambda Delta. He has received numerous awards and scholarships, including an Edgar J. Luecke Z* award, a National Academy for Nuclear Training Scholarship, and a Hesse Scholarship. He has already had success in the business sector through internships at Gentex Corporation and Exelon Corporation.

Ben's nomination included this description: "(he) exemplifies a spirit of liberal culture where outstanding academics are coupled with an experience of servant leadership."

Glenn M. Miltenberg

GLENN M. MILTENBERG, *Colorado Zeta '13*, has been named a 2013 Tau Beta Pi Laureate for his achievements in athletics. He is an aerospace engineering graduate from the United States Air Force Academy.

His athletic achievements as a Cadet at USAF include intercollegiate boxing, competitive skydiving, and as a parachute team member. He has also excelled in the classroom and in military training, achieving a 3.25 military performance average placing him in the top ten percent of Cadets. In the boxing ring, Glenn is a three-time USAF Academy Wing Open Boxing Champion and is the first boxer in program history to be honored with the Wing Open Outstanding Boxer Award twice in a career. He has earned medals at the 2011 & 2012 U.S. Parachute Association Collegiate National Skydiving Championships.

Glenn is also an instructor and certified Jumpmaster teaching basic parachute courses and a member of the Wings of Blue competition team that competes with some of the world's best skydivers. Most recently, he completed the Airmanship 420 Powered Flight Program with several flight hours in a T-53A trainer aircraft and has been selected for Euro-NATO joint jet pilot training flight school after graduation. Glenn was cited in his nomination packet as a positive role model, a man of character, and as one of tomorrow's leaders.

Adam R. Pizzaia

ADAM R. PIZZAIA, *New Jersey Beta '13*, has been named a 2013 Tau Beta Pi Laureate for his diverse achievements. He graduated with a degree in mechanical engineering and will earn a master's in fluid mechanics later this year from Rutgers University.

Adam became an Eagle Scout after participating for ten years in Boy Scouts. This early devotion to service and hard work has shaped his commitment to the community. His selfless acts of service include spending last summer volunteering at HIV orphanages and secondary schools in Tanzania, Africa, as an engineering tutor, and with the Catholic Student Association. As a ΤΒΠ member, he was focused on generating interest in developing the minds of young students to pursue STEM related careers.

Adam is responsible for pioneering his chapter's K-12 MindSET program activities at a local middle school. He also served as chapter president for the most recent academic year. At Rutgers, he was elected as president of the University Honors Council. Adam has developed an industry mentorship program recruiting industry leaders to mentor current students. He also helped design a program that pairs incoming freshmen with upperclassmen honor society students.

The common theme of his nomination packet is his endless contributions and dedication for projects that have a positive impact on others.

RoboCop: It's the Law, Your Honor..... but not as We Know It

Robots, drones, AI, and ubiquitous sensors are invading our world. Will autonomous law enforcement be far behind?

By Alan S. Brown

Walk into a bar and start talking about robots and law enforcement, and you are likely to get those special looks usually reserved for people who claim they were abducted by aliens.

Step outside, however, and the picture changes.

If you frequent bars a bit too much, you might need to blow into a court-mandated device that measures blood alcohol levels. It decides whether you are sober enough to drive home. If you shoot through a red light, speed, or fail to pay a highway toll, automated cameras will photograph your car's license plate and send you a ticket.

Current law enforcement technology (above left and middle) differs dramatically from science fiction's RoboCop (above right). Still, very sophisticated systems (below) are increasingly being adopted by local police.

Photos at left, from left.: Hustvedt, Derek Jensen, and Karl Palutke

These devices enforce laws autonomously, with no human intervention.

If you live near a border, you might hear a drone flying overhead, searching for illegal entrants. The U.S. Customs and Border Protection agency is also testing AVATAR, a kiosk-based computer that interrogates people entering the country and analyzes involuntary responses (eye movement, voice constriction) for telltale signs of lying.

High Crime Rates

Further inland, small drones are taking to the skies. Right now, police use them to support police operations, monitor areas with high crime rates, and search for missing people.

Your town may own a ground robot similar to those used in Iraq and Afghanistan. Police use them to scope out dangerous situations, check suspicious packages, and disarm bombs. Equipped with a shotgun, they can blow open locked doors.

Today, humans operate drones and robots and act on any danger signals from AVATAR kiosks. These devices are likely to become more autonomous in the future.

If they do, they will be able to use today's ubiquitous sensors as their eyes and ears. Many stores, hotels, airports and train stations have security cameras. Some cities, such as London, have placed them on the streets and subways. These cameras are increasingly networked.

Many police cars automatically record the license plates of passing motorists. Toll booths note where and when we ride on highways. The National Security Agency (NSA) collects phone call records. The post office images all mail. Phones signal our GPS location. Nearly all new cars have "black boxes" that store some details about our driving behavior.

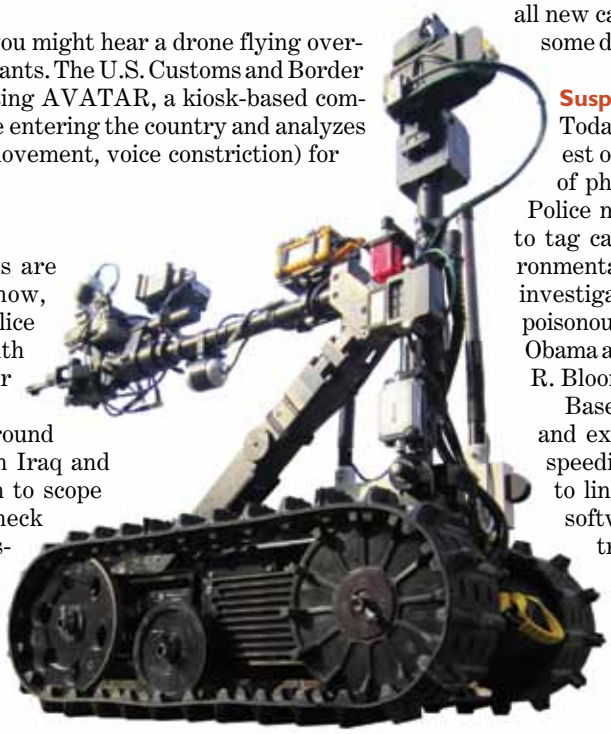


Photo: QinetiQ, Inc.

Suspicious Activity

Today, this data receives only the barest of analysis. NSA looks at patterns of phone calls for suspicious activity. Police most often use license plate data to tag cars whose registrations or environmental permits have expired. Criminal investigators used postal images to trace poisonous letters sent to President Barack Obama and New York City Mayor Michael R. Bloomberg, *MD A '64*.

Based on when and where cars enter and exit a turnpike, states could issue speeding tickets. How hard would it be to link other sensors to sophisticated software designed to enforce other traffic laws autonomously?

Today's automated law enforcement is primitive when compared with what we are likely to see in the future. Engineers and computer scientists are achieving breakthrough after

breakthrough in sensors, robots, drones, and artificial intelligence. We are approaching a day when autonomous robotic law enforcement will become a real possibility.

That may sound creepy to some. Others see it as a way to enforce laws without bias. After all, a robot would ticket the town mayor and his janitor without worrying about political influence. Look a little closer, though, and we may wish for more, rather than less, application of human judgment.

Boston

The search for the criminals behind the Boston Marathon bombing shows how many of these capabilities can come together to aid law enforcement.

Immediately after the bombing, law enforcement agencies began collecting surveillance tapes from local stores and bystanders who took videos of the event.

Photo: Aaron "Tango" Tang

The investigations after the Boston Marathon bombing (above) utilized multiple technologies including extensive video analysis.

Photo: David Greenspan - MIT

Eigenfaces (above) are a set of vectors which aid in the process of computer-based facial recognition. A set of eigenfaces can be generated by performing a mathematical analysis on a large set of images depicting different human faces.

Boston and the surrounding communities had only about 150 outdoor and 400 subway surveillance cameras, according to a 2010 survey by the American Civil Liberties Union. This is far fewer than the 3,000 networked government and private cameras in New York City's financial district or the 400,000 cameras spread throughout London.

Several companies, such as IPVideo and ObjectVideo, have developed artificial intelligence software to scan crowds for suspicious behaviors. They might, for example, highlight when someone leaves a package or bag on the ground or lurks in the stairwell of a parking garage. They might have alerted police to the backpack bombs left in the street or provided clues to track down the suspects.

Photo: University of Arizona

The AVATAR kiosk (left) asks an interviewee a series of question and then scans for signs of deceptive answers.

Instead, police went through the videos they collected, looking for known terrorists and suspicious behavior. They narrowed their search when a wounded bystander told the FBI that a young man in a baseball cap and sunglasses had placed a backpack on the ground and walked away. This narrowed the search, and police soon found videos of two men in baseball caps and backpacks walking away too casually from the blast.

The police tried identifying the suspects with facial recognition software. This failed, even though suspect Dzhokhar Tsarnaev had a driver's license and his brother Tamerlan had been investigated by the FBI.

This suggests the technology did not work. In fact, facial recognition has long been oversold. Many airports installed systems following 9/11, only to remove them later because they were useless.

Advanced Rapidly

Yet in the past decade, the technology has advanced rapidly. In fact, the Boston investigators might have found a match if they used the right software.

Shortly after the bombing, Anil Jain and Josh Klontz of Michigan State University's Pattern Recognition and Image Processing Laboratory tested three different commercial facial recognition programs. They seeded a database of 1.6 million images with pictures of the two Tsarnaevs. The software compared photos of the suspects released by the police with the database. NEC's NeoFace found a strong match with Dzokhar but not Tamerlan, who was wearing sunglasses that obscured his face.

Photo: QinetiQ, Inc.

NeoFace is designed to work with low resolution surveillance camera videos. Like many facial recognition programs, it measures faces by how much they vary from a set of generic faces called eigenfaces. According to NEC, NeoFace can identify people with as little as 24 pixels worth of information between a target's eyes.

A system under development at Carnegie-Mellon University's CyLab Biometrics Center takes a different approach. It enhances surveillance pictures 1600 percent, compared with 400 percent for conventional software. When the lab's director, Marios Savvides, added surveillance images of the Tsarnaevs to a database of 50,000 photos, the software picked Dzhokhar's photo as the eleventh most likely match.

These methods rely on machine intelligence that makes comparisons using statistical methods. They work best when faces are well lit and facing forward. AI researchers are working on new systems that mimic the structure of the brain. They believe such systems will enable their software to recognize faces when partially lit or in profile.

Identified Suspects

One day, such systems may be good enough to patrol airports, train stations, and even city streets.

Ultimately, Boston investigators identified the suspects by releasing their photos to the public.

Until then, they had no idea what kind of threat they were facing. As a result, police shifted into overdrive after the explosions to search public places for bombs. Bomb squads from surrounding towns and states converged on Boston to help. Often, they brought robots.

Most were designs pioneered in Iraq and Afghanistan. They generally look like tiny tanks with a single manipulator arm sticking out of their center. They include the 100-pound Talon by QinetiQ and 40-pound PackBot from iRobot, a company better known for its Roomba vacuum cleaner robots. The teams worked nearly 24/7. Remotely controlled robots sifted through trash bins, probed abandoned rubbish, and opened suspicious packages, said Charlie Dean, QinetiQ North America's director of business development for unmanned systems. The police used a Talon robot to check the brothers' car for explosives after the shootout and a truck-based robotic arm to pull away the tarp on the boat where Dzhokhar was hiding.

Dean guesses there were dozens of robots in Boston. "They are a great example of using unmanned systems to support human operations to investigate a crime," he said.

Photo: iRobot

Robots like the QinetiQ Dragon Runner (top left), iRobot PackBot (above) and the throwable FirstLook (top right) routinely probe safely into situations which are either too dangerous or inaccessible.

Photo: iRobot

Surrendered To Robot

Robots (and drones) have been working their way into law enforcement well before the Boston Marathon bombing. In 2007 in North Fort Myers, FL, for example, sheriff's deputies subdued a man when he shot a robot sent to distract him.

Two years later, a gunman took hostages and threatened to set off a bomb in a rural Virginia post office. After nine hours, he surrendered to a bomb squad robot. This past year, several suspects surrendered after surveillance robots pinpointed their location.

The rise of police robots coincided with military use in Iraq and Afghanistan. QinetiQ alone supplied

4,000 military robots that have taken out more than 30,000 improvised explosive devices (IEDs), Dean said.

Larger robots with manipulator arms use high pressure water cannons, called disruptors, to cut off the bombs' triggers. Their operators use cameras on the robot to control them. They can use the robots to search a house or dig through a pile of junk to look for suspicious objects. Robots can also mount a shotgun and blow open a locked door, an extremely dangerous job for soldiers.

iRobot's FirstLook and QinetiQ's Dragon Runner are small treaded robots that weigh about five pounds. Instead of an arm, they mount cameras. Soldiers throw around corners, over walls, or into rooms to check for danger.

Police use robots in similar ways. FirstLook, for example, has four cameras and two-way audio. It not only withstands falls down staircases or 16-foot drops onto concrete, but automatically rights itself and starts moving.

"What's the difference whether the drone is up in the air or on a building,? You can't keep the tide from coming in."

—Michael R. Bloomberg, MD A '64, Mayor, New York City

"They provide a set of eyes and ears before the tactical team moves in," Tom Phelps, iRobot robotics products director said.

According to Phelps, police bomb squads were the first to adapt robots, which enabled them to work at safer distances. Tactical (SWAT) teams soon followed, using robots to check situations without risking police officers.

Some first responders use robots to deal with hazardous materials. The robots carry sensors to identify the risk. They may even help bring the situation under control with their manipulator and disruptor.

Suspicious Objects

The Brazilian government recently contacted Phelps about using manipulator robots to investigate abandoned backpacks and other suspicious objects at the upcoming soccer World Cup and Olympics.

QinetiQ's Dean believes the border patrol will eventually add fast moving autonomous ground vehicles for reconnaissance.

"If you have a large border and limited staff, technology can help you learn more than a pair of binoculars. Unmanned vehicles could cover the gaps where there are no people or sensors to report activity," Dean said.

Today, large drones, such as the Predator, already cover those gaps. They use infrared sensors to spot people crossing illegally at night.

Drones have already helped police apprehend criminals. In 2010, for example, police used a drone helicopter to capture a car thief outside Liverpool, U.K. The three-foot-long helicopter used a thermal imaging camera to locate the suspect through dense fog.

Police departments want to use small drones, which cruise close to the ground and have limited range, to patrol high-crime areas, search for illegal drugs, survey crime scenes, and gather intelligence before officers open a gate or enter a house.

Photo: Draganfly Innovations, Inc.

Compared with conventional helicopters, aerial drones like the Draganflyer X6 (above) are more practical for a wider variety of law enforcement duties.

Photo: YEPPOON

Yet drones have become a flashpoint for growing concerns about surveillance and civil liberties.

If there was any case that really set this off, it was the 2011 arrest of a North Dakota family of "sovereign citizens" who were charged with taking cows that had strayed onto their property. When the local sheriff went to investigate, the family met him with shotguns at the door. He borrowed a Predator B (now called a Reaper) drone. When operators determined the family was not carrying weapons, he swooped in to make an arrest.

Since then, the liberal American Civil Liberties Union and many conservative libertarian groups have come out against using drones to spy on citizens. When Houston police proposed using the aircraft to issue traffic citations, public anger scuttled the plan.

Other towns rallied against airborne monitoring of their shopping districts.

Deer Trail, a town of 550 people in Colorado, even considered paying a bounty to citizens who shot down drones. Yet even in Colorado, no one complained when the Mesa County Sheriff used a two-pound Draganflyer X6 to search a mile-long tract for a missing person. Ordinarily, sheriff deputies and volunteers would spend hours walking the site shoulder to shoulder. The drone completed the search in an hour.

In a world where London has 400,000 public cameras, arguing over surveillance drones may be a moot point. "What's the difference whether the drone is up in the air or on a building," said New York Mayor Bloomberg. "You can't keep the tide from coming in."

Often Disturbing

The implications of drones, robots, and AI systems are often disturbing, especially for people concerned about civil liberties. Yet today's systems are essentially extensions of human beings. The pilot, driver, or software operator makes the real decisions.

What happens when robots begin making decisions on their own?

Autonomous robots are already on the way, according to Peter Singer, an expert on robotic warfare at Brookings Institution. He points to the new Reaper drone as an example. It can take off, land, fly mission waypoints, and analyze

Photo: iRobot

In military and law enforcement situations, (left) the deadly risk of stepping through a door when unknown subjects are inside can be borne by robots.

sensor data, such as identifying depressions in the dirt as footprints from one mile high, without human intervention.

On the ground, robots can already right themselves if they fall over and retrace their route if they lose communication with their operator. They have improved their ability to navigate obstacles without human help, iRobot's Phelps said.

Shoot Enemies autonomously

Meanwhile, militaries around the world are working on autonomous robots that can identify and shoot enemies autonomously. For example, South Korea patrols its northern border with armed robots built by Samsung Techwin. While humans are in control, the robots also have an automatic mode.

Israel already enforces its no-go zone near Gaza using stationary robots that autonomously combine sensor and drone data to identify targets. While the guns could fire autonomously, Israel currently requires a commander's orders. Israel is also testing 10 autonomous vehicles along its borders. They could carry weapons in the future.

Autonomous killer robots make sense for militaries. They process information faster than humans, lack fear, make decisions without emotion, and insulate soldiers from risk. These arguments resonate with police departments.

They are given special credence because roboticists are making startling advances in autonomy. Improved statistical techniques and new software architectures that mimic the human mind have significantly boosted AI capabilities. This is especially true in pattern recognition. Just consider the dramatic improvements in Apple's Siri and other speech recognition systems or the ability of Facebook to automatically tag pictures of our friends.

The real holdup has been shrinking the vast array of sensors robots need to move, avoid obstacles, assess threats, and make decisions. Right now, they are small enough for an autonomous vehicle like Google Car but too large for a Talon or PackBot.

Dean expects sensors will eventually shrink and robots will become more autonomous. Yet no one is rushing to give robots weapons.

"In my mind, the sensors don't exist today that will allow a machine to make such deadly decisions. The sensors have

Photo: General Atomics Aeronautical Systems, Inc.

A new frontier?: One sheriff drew criticism for using a Predator B drone for surveillance before making an arrest.

Photo: QinetiQ, Inc.

Army Sgt. 1st Class Jason Mero, right, describes the capabilities of the SWORDS (Special Weapons Observation Remote Direct-Action System) robot to a Washington Auto Show attendee.

to be more reliable. And in the end, the robots have to be able to determine the intent of a human being, and that is sometimes hard to determine," Dean said. Yet many robots are already packing. Disruptors, which can cut through iron pipe bombs, are certainly weapons. So are the shotguns some robots use to blow open locked doors.

"They're not engaging human threats," Dean retorted. "They're just getting through locks and doors. Otherwise, you have to put a human in front of the door, and that's a hugely dangerous place for a police officer."

Dean is right, of course. But such logic requires only a small step to go from opening a door to entering and clearing a building. From there, doesn't it make sense for robots to return fire if they are attacked instead of risking a cop's or sheriff's life.

At least autonomous robots won't react emotionally or shoot first out of fear. They may prove better at identifying a shooter in a fast changing situation.

Unbiased Law Enforcement

Perhaps we may be entering an era of safer, more unbiased law enforcement.

Or not. Autonomous robots are creatures of their software, and programmers cannot help embedding their biases and understanding (or lack of it) in what they write.

Last April at We, Robot, a conference on robots and the law held at Stanford University, a group of researchers from West Point and Cumberland School of Law ran a test to see how programmers might write code to enforce the law.

The researchers asked 52 experienced programmers to write software that would automatically ticket speeders. The researchers gave them speed zone information and a database of vehicle speed sampled three times per second.

The results varied wildly.

The problem was that programmers had to make value judgments about the letter of the law, the intent of the law, and how to implement the intent of the law within the design specification, said Greg Conti, an associate professor in electrical engineering and computer science at West Point.

They had to decide about tolerance, how much faster than the posted speed limit deserves a ticket, and also how long a vehicle should be allowed to drive at those speeds before it was ticketed.

This led to even more gray areas. "Tolerance is not necessarily one fixed value. It is different if you are doing 15 miles per hour in a 10 miles per hour school zone, and 75 miles per hour on a 65 miles per hour highway," Conti said.

Programmers also had to grapple with the intent of law. Should they penalize every driver who goes over the speed limit? Just try to keep unsafe drivers off the road? Or encourage most people on the road to drive safer?

Allow Some Slack

Programmers came up with different ways to apply the law. Some issued tickets to any speeders. Others allow some slack. Still others warned speeders, then issued tickets. One assigned a small fine that kept growing unless the driver decelerated.

That last solution caught the attention of the conference because it solved the problem in a way a human policeman could not.

Oddly enough, something like it already exists.

Let's go back to your hypothetical bar friends, who laughed off your concerns about robots and law enforcement. They may have driven home in cars that already report their driving behavior—speed, sudden stops, and sharp turns—not to the police, but to an insurance company that lowers their rates if they drive safely.

It is just another example of how the technology for autonomous law enforcement is quietly infiltrating our world. Given our rapid progress in AI and robotics, New York's Bloomberg may be right. These technologies may be inevitable.

Yet we are not likely to arrive at any consensus on how to use them for many years to come.

Alan S. Brown has been an editor and freelance writer for more than 30 years and lives in Dayton, NJ (insight01@verizon.net). A member of the National Association of Science Writers and former co-chair of the Science Writers in New York, he graduated magna cum laude from New College at Hofstra University in 1974. He is an associate editor of *Mechanical Engineering* and contributes to a wide range of engineering and scientific publications.

Uniting a State with Steel

Five mile long suspension bridge brings together two peninsulas of Michigan to create a modern marvel of civil engineering

By **Colleen L. Hill-Stramsak,** P.E., *MI E '00*

The Mackinac Bridge is a modern civil engineering marvel. The five mile long bridge was the longest suspension bridge when construction was completed in 1957. The Mackinac Bridge is listed as a National Historic Civil Engineering Landmark by the American Society of Civil Engineers (ASCE), one of the youngest bridges to receive this honor.

The Mackinac (pronounced Mackinaw) Bridge connects Michigan's lower and upper peninsulas. The "Mighty Mac" spans the Straits of Mackinac and connects Mackinaw City in the south to the city of St. Ignace on the north.

The need for a connection between Michigan's peninsulas had been discussed since the late 1800s, with large stores of natural minerals and recreational areas in the Upper Peninsula (called the U.P. for short) and industrialized cities in the Lower Peninsula. It was logical to have a permanent all season connection between the two peninsulas.

The Straits of Mackinac was traversed by ferry service operated by the state highway department from 1923 to 1957, but all year service attempts were not successful, which continued the discussion for a permanent solution. Ferry service also had extreme backups in peak season, sometimes extending up to 15 miles from the ferry terminal on the Lower Peninsula side.

Suggested Floating Tunnel

In 1920, the highway commissioner suggested a submerged floating tunnel and asked for other suggestions to create a crossing. The counter proposal suggested a 17 mile route of causeways and bridges using several islands (including Mackinac Island) to connect the city of Cheboygan in the Lower Peninsula to St. Ignace in the U.P.

In 1934, the Mackinac Straits Bridge Authority was established to investigate the feasibility of a permanent crossing. After several applications to the public works administration for the Cheboygan to St. Ignace alignment were denied, a direct crossing was investigated and found feasible.

World War II halted progress on the new alignment until the Mackinac Bridge Authority was established in 1950.

Mackinac Minutiae

- *Total length of bridge: 26,372 feet*
- *Length of suspension bridge (including anchorages): 8,614 feet*
- *Main span length: 3,800 feet*
- *Total length of wire in main cables: 42,000 miles*
- *Number of wires in each cable: 12,580*
- *Diameter of main cables: 24 ½ inches*
- *Total weight of bridge: 1,024,500 tons*
- *Total number of engineering drawings: 4,000*
- *Total men employed, at the bridge site: 3,500*
- *Total number of engineers employed: 350*

The "Proposed Mackinac Straits Bridge Preliminary Report" was authored by the Board of Engineers of the Mackinac Bridge Authority: Othmar H. Ammann, *NY E 1902*, David B. Steinman, P.E., *NY A 1906*, and Glen B. Woodruff on January 10, 1951. This typewritten report gives concise and specific details about the preliminary investigations that led to the final design.

The report discusses the option to build a three lane bridge with a movable barrier to handle peak directional flow of traffic on the bridge. The report quickly rules out the three lane option due to the traffic analysis indicating that northbound traffic would be 1500 vehicles per hour and likely to triple in 50 years.

While the three lane option may have been able to handle the projected traffic, there would have been no provisions for emergency traffic during peak summer weekend periods. Today, peak for Bridge traffic is generally in July or August. In August 2012, 541,838 vehicles crossed the bridge.

Tacoma Bridge Failure

Steinman was an experienced bridge designer who had bid on and lost the contract to design the original Tacoma Narrows Bridge and went on record saying that it would fail. Due to the failure of the Tacoma Narrows Bridge, design features incorporated into the design of the Mackinac Bridge were strengthened:

- Stiffening trusses were increased to a depth of 45 feet
- Transverse floor beams were designed as open trusses instead of solid web girders
- Suspension deck designed with open grating on the inside lanes and proposed steel grating filled with lightweight concrete, covered with bituminous concrete (asphalt) to reduce the deck weight.
- The two truss structures that form the towers support the main span reach 552 feet above the water and 210 feet below the water.

Bridge construction began in May of 1954 and the Mighty Mac opened to traffic November 1, 1957.

Photos:
Main picture: The Mackinac Bridge seen from the south shore of the Lower Peninsula, with St. Ignace to the north.
Inset, left: A freighter passes beneath the main span.
Inset, right: A Mackinac Island ferry passes in front of the bridge.
Right: People make their way across during a Mackinac Bridge Walk.
Below: A panorama of the bridge, seen at sunset from Mackinac Island.

Colleen L. Hill-Stramsak, P.E., *Michigan Epsilon '00,* is a senior project engineer leading the transportation department at Hubbell, Roth & Clark, Inc. in Bloomfield Hills, MI. She serves on the International Board of Direction for the Institute of Transportation Engineers (ITE). She is President of the Southeastern Michigan Alumni Chapter and Advisor to the Michigan Epsilon Chapter. Colleen was President of *MI E* in 1998-99.

Tau Beta Pi Names 210 Scholars for 2013-14

THE FELLOWSHIP BOARD announced the selection of 210 TBΠ Scholars from 364 applicants for senior-year study in the 2013-14 academic year. Scholarships of $1,000 or $2,000 are given to members on the competitive bases of scholarship, campus leadership and service, and promise of contributions to the engineering profession, with consideration given to economic need and academic commitment. A total of 1,526 Scholars have received $3,007,000 in scholarships in the fifteen year history of the program.

The Alabama Power Foundation, Inc., made a gift which supports the tenth **Alabama Power Scholarship**.

The eighth **Alford Scholarship** is named for Henry M. Alford, *MS A '27*, who left a bequest to TBΠ in 2005.

Ernest E. Althouse, *PA A '26*, left a bequest to TBΠ in 2006 that supports the fifth **Althouse Scholarship.**

The seventh **Bloomberg Scholarship** is named for Michael R. Bloomberg, *MD A '64*, whose 2006 gift will support a total of 10 awards.

The Bose Foundation made a gift to fund the seventh **Bose Scholarship**.

Ruth M. and Cleveland L. Campbell, P.E., *IA* A *'47*, proudly sponsor the twenty-seventh and twenty-eighth **Campbell Scholarships**.

The sixth **Curtis Scholarship** is named for Richard A. Curtis, Ph.D., *OH A '64*, who left a bequest to the Society.

Six additional **Dodson Scholarships** are sponsored by Charles R. Dodson, *MD B '30*, who made generous gifts to TBΠ in 1998 and 1999.

The three **Fife Scholarships** are sponsored by the late William Fife, *CA A '21*, and are named in honor of his father, James.

Ten **Forge Scholarships** are named for Charles O. Forge, *CA Γ '56*, who left bequests to TBΠ in 2010.

GEICO sponsors seven additional **GEICO Scholarships** this year.

The **Hart Scholarship** is named in memory of Arline I. and Jack B. Hart, Sigma Tau *Φ* '43, who included Tau Beta Pi in their estate plans.

The fifth and final **Kolff van Oosterwijk Scholarship** is named for H.L.J. Kolff van Oosterwijk, *CA A '50*, who left a bequest in 2008.

The tenth **Mentor Scholarship** is given in admiration of the 1926-46 automobile industry by James P. Tarwater, *MO B '51*.

George P. Mitchell, *TX Δ '40*, made a special gift to sponsor the fourth **Mitchell Scholarship**.

Two **Nagel Scholarships** are given in honor of former Secretary-Treasurer Emeritus R.H. Nagel, P.E., *NY Δ '39*.

One hundred six **Record Scholarships** are sponsored by Leroy E. Record, *KS* A *'29*, whose generous bequest in 2001 funded the Record Scholarship Fund to provide earnings for awards in perpetuity.

The third **Schwaller Scholarship** commemorates Shawn R. Schwaller, *SD A '95*, whose friends and family established a fund in 2007.

Four **Scribner Scholarships** are named for A. Clayton Scribner, *NY Γ '29*, whose 2003 bequest endows the award.

The first **Sickafoose Scholarship** is named for Kathleen A. and Robert D. Sickafoose, *IL B '50*, who left a bequest to the Association in 2012.

Elsa and Peter H. Soderberg, *CT A '68*, sponsor two additional **Soderberg Scholarships** this year.

An additional fifty-five **Stabile Scholarships** are named for Vincent A. Stabile, *NY Λ '40*, whose gift in 1999 endowed the awards.

The **Webster Scholarship** is named for Charles M. Webster, *OH B '50*, who left a bequest to TBΠ in 2011.

Nicholas S. Aerni, *Record Scholar No. 787*

NICK IS MAJORING IN ELECTRICAL AND COMPUTER ENGINEERING at the University of Kentucky. He holds officer positions in TBP and IEEE, and was recently named president of the UK chapter of Eta Kappa Nu. This summer he studied renewable energy in Pamplona, Spain, and is working a second rotation with Duke Energy. Upon graduation, he will pursue an MBA and M.S. in E.E. before beginning a career within renewable energy and energy efficiency.

Taylor A. Albrecht, *Dodson Scholar No. 50*

TAYLOR IS STUDYING CHEMICAL ENGINEERING at the University of North Dakota. She is an officer in AIChE and the activities coordinator of the Engineers' Council. The past two years, she has interned at a contract manufacturing company and loved the research and development aspect of medical products. She plans on either pursuing a master's in biomedical engineering or seeking a job manufacturing medi-

Sara M. Albritton, *Record Scholar No. 788*

SARA IS A CIVIL ENGINEERING MAJOR at Clemson University and is involved on campus with a Christian ministry, called the Navigators. She enjoys being outdoors, playing sports, and traveling. After graduation, she hopes to get involved in a non-profit organization that does ministry in third-world countries, such as building water wells in isolated villages or improving infrastructure where needed.

RECIPIENT	CHAPTER	FIELD OF STUDY	SCHOLARSHIP
Nicholas S. Aerni	KY A '15	Electrical Engineering	Record No. 787
Taylor A. Albrecht	ND B '14	Chemical Engineering	Dodson No. 50
Sara M. Albritton	SC A '15	Civil Engineering	Record No. 788
Philip M. Albu	SD B '14	Computer Science and Engineering	Record No. 789
Ronald B. Alexander	IL Γ '14	Chemical Engineering	Sickafoose No. 1
Malia B. Amling	OH N '14	Electrical Engineering	Record No. 790
Robert T. Andon	MD Γ '14	Systems Engineering	Nagel No. 41
Alexandra M. Arambula	TX A '14	Biomedical Engineering	Nagel No. 42
Kayla S. Arruda	MA E '15	Civil Engineering	Record No. 791
Arslan Arshad	AL E '15	Chemical Engineering	Record No. 792
Peter M. Attia	DE A '14	Chemical Engineering	Record No. 793
Julia A. Baaklini	NJ Z '14	Civil Engineering	Campbell No. 27
Aaron T. Baldwin	IN Δ '14	Electrical Engineering	Record No. 794
Madelyn R. Ball	NH A '14	Chemical Engineering	Record No. 795
Matthew W. Barnett	AL E '14	Mechanical Engineering	Stabile No. 193
Odkhuu Batmunkh	CA H '14	Software Engineering	Forge No. 11
Jennifer L. Batt	CA Y '13	Civil Engineering	Record No. 796
Grant H. Bauer	MN A '14	Aerospace Engineering and Mechanics	Record No. 797
Joanne K. Beckwith	OH Z '13	Chemical Engineering	Record No. 798
Kelly L. Benton	MT B '15	Environmental Engineering	Scribner No. 21
Raymond A. Bilodeau	UT B '14	Mechanical Engineering	Stabile No. 194
Collin S. Black	UT B '16	Chemical Engineering	Record No. 799
Nicole L. Black	MA H '14	Biomedical Engineering	Record No. 800
Matthew R. Boler	FL H '14	Mechanical Engineering	Soderberg No. 19
Spencer H. Bowen	UT B '14	Chemical Engineering	Record No. 801
Benjamin D. Braun	KS A '14	Mechanical Engineering	Stabile No. 195
Sean R. Brown	UT B '14	Mechanical Engineering	Record No. 802
Shannon B. Brown	FL A '13	Agricultural and Biological Engineering	Record No. 803
Joshua D. Bryan	OH I '14	Civil Engineering	Scribner No. 22
Ethan L. Budreau	IA B '14	Mechanical Engineering	Stabile No. 196
Annicka K. Carter	UT A '14	Bioengineering	Record No. 804
Laiara R. Cerri	NY Ξ '13	Civil Engineering	Record No. 805
Amanda Chen	NY K '14	Biomedical Engineering	Record No. 806
Bingxuan D. Chua	NY Δ '14	Chemical Engineering	Record No. 807
Michael B. Cloward	UT B '13	Mechanical Engineering	Stabile No. 197
Briana A. Conners	OH B '14	Chemical Engineering	Webster No. 1
Guy J. Cordonier	WV A '14	Mechanical Engineering	Stabile No. 198
Turner L. Cotterman	SC A '15	Electrical Engineering	Record No. 808
James A. Cranney	UT B '15	Mechanical Engineering	Stabile No. 199
Bria O. Crawford	DC A '14	Civil Engineering	Record No. 809
Andrew J. Creighton	AZ B '14	Aerospace Engineering	Record No. 810
William A. Curbow	AR A '14	Electrical Engineering	Record No. 811
Nathaniel L. Decker	UT Γ '14	Computer Engineering	Record No. 812
Danielle M. Defeo	NJ A '15	Mechanical Engineering	Stabile No. 200
Tyler A. Dell	CO Δ '14	Civil Engineering	Record No. 813
Brandon M. Demerath	IA B '14	Mechanical Engineering	Stabile No. 201
Nathaniel R. Devoe	ME A '14	Mechanical Engineering	Stabile No. 202
Sydnee B. Dieckman	WA B '14	Civil Engineering	Record No. 814
Sarah E. Divel	IN Γ '14	Electrical Engineering	Record No. 815
Ria C. Domier	AL B '14	Chemical Engineering	Record No. 816
Matthew O. Duffield	UT B '14	Mechanical Engineering	Stabile No. 203
Kevin T. Eck	GA B '14	Mechanical and Aerospace Engineering	Stabile No. 204
John F. Edelbrock	OH A '14	Polymer Science and Engineering	Curtis No. 6
Youssef M. Elkady	TX A '14	Petroleum Engineering	Dodson No. 51
Charles E. Elliott	AL E '14	Mechanical Engineering	Record No. 817
Elizabeth M. Fischer	NY Π '14	Mechanical Engineering	Stabile No. 205
Joshua K. Fleming	OH N '14	Electrical Engineering	Record No. 818
Casey M. Fontana	NJ Z '14	Civil Engineering	Record No. 819
Christopher W. Fox	OH N '14	Mechanical Engineering	Stabile No. 206
Joy A. Franco	CA H '14	Mechanical Engineering	Forge No. 12
Joshua D. Frash	OH Δ '15	Chemical Engineering	Record No. 820
Ethan C. Fryer-Ressmeyer	MN A '14	Aerospace Engineering and Mechanics	Record No. 821
Eric G. Fuller	UT B '15	Chemical Engineering	Record No. 822
Hang Gao	IA B '14	Mechanical Engineering	Stabile No. 207
Robert A. Gentile	WI Δ '14	Mechanical Engineering	Stabile No. 208
Justin M. Gerber	FL I '14	Aerospace Engineering	Record No. 823
Nicholas D. Glynn	IA B '14	Chemical and Materials Engineering	Record No. 824
Albert R. Gnadt	WI A '14	Mechanical Engineering	Stabile No. 209

RECIPIENT	CHAPTER	FIELD OF STUDY	SCHOLARSHIP
Jillian K. Gorski	PA Λ '14	Bioengineering	Record No. 825
Jenafer L. Graham	OR Γ '14	Computer Science	Oosterwijk No. 5
Tawna M. Groom	ID Γ '14	Civil Engineering	Record No. 826
Robert J. Hall	SC A '14	Bioengineering	Record No. 827
Zachary A. Hamann	ND B '14	Mechanical Engineering	Stabile No. 210
Abraham W. Hamilton	ME A '14	Mechanical Engineering	Stabile No. 211
Erika D. Handly	UT B '14	Chemical Engineering	Record No. 828
Jared H. Hara	CA Z '14	Bioengineering	Forge No. 13
Mark G. Harries	ND B '15	Mechanical Engineering	Stabile No. 212
Kazi Y. Helal	NY P '14	Chemical Engineering	Bloomberg No. 7
Clarissa L. Hernandez	AL E '14	Chemical Engineering	Record No. 829
Logan D. Hopper	AL B '13	Mechanical Engineering	AL Power No. 10
David L. Hutchins	MT B '14	Environmental Engineering	Scribner No. 23
Ellen M. Ibister	MN B '14	Mechanical Engineering	Stabile No. 213
Joshua D. Jacobson	IL Γ '14	Computer Engineering	Record No. 830
Trevor C. Jobst	MT A '14	Mechanical Engineering	Stabile No. 214
Benjamin R. Johnson	SD A '14	Industrial Engineering	Stabile No. 215
Jennifer N. Johnson	CA Φ '14	Computer Engineering	Forge No. 14
Kati J. Johnson	SD A '14	Chemical Engineering	Stabile No. 216
Kevin R. Johnson	IA B '14	Biomedical Engineering	Record No. 831
Joshua D. Jones	GA A '14	Mechanical Engineering	Stabile No. 217
Tyson D. Kesler	UT Γ '14	Mechanical Engineering	Stabile No. 218
Sara A. Khalek	GA A '14	Biomedical Engineering	Record No. 832
Seth Kijewski	SD A '14	Mechanical Engineering	Stabile No. 219
Claire E. Kilmer	NC A '14	Chemical Engineering	Dodson No. 52
Anna D. Koch	OR A '14	Electrical Engineering	Althouse No. 5
Daniel P. Koch	UT B '14	Mechanical Engineering	Stabile No. 220
Reed A. Kopp	PA B '14	Aerospace Engineering	Record No. 833
Garrison B. Kubis	MN A '14	Computer Science	Record No. 834
Linda C. Kuenzi	AZ B '13	Aerospace Engineering	Record No. 835
Neeldev Kunjur	IL Γ '14	Electrical Engineering	Record No. 836
Aimee V. Kuntz	MT B '15	Petroleum Engineering	Dodson No. 53
Michael A. Kuprenas	SC B '13	Chemical Engineering	Record No. 837
Minnie Lahoti	AL B '14	Chemical Engineering	Record No. 838
Jill E. Langlas	KS A '14	Mechanical Engineering	Stabile No. 221
Bradford J. Lapsansky	PA B '14	Engineering Science	Record No. 839
Alexa J. LaQua	ND B '15	Geological Engineering	Scribner No. 24
Jin W. Lee	NY T '14	Industrial and Systems Engineering	Soderberg No. 20
Sangmin Lee	MI Γ '15	Chemical Engineering	Record No. 840
Stephen J. Lee	LA B '14	Biomedical Engineering	Alford No. 8
Yoon H. Lee	IL Γ '14	Biomedical Engineering	Record No. 841
Jacob R. Leins	CO Δ '14	Civil Engineering	Record No. 842
Andrew M. Liebendorfer	OH A '16	Computer Science	Record No. 843
Shuwen Lin	LA B '14	Chemical Engineering	Record No. 844
Connor J. Lind	CA E '14	Mechanical Engineering	Forge No. 15
Qinye Liu	PA B '14	Mechanical Engineering	Record No. 845
Wuli Liu	NY Θ '14	Electrical Engineering	Record No. 846
Cody J. Lundie	SD A '14	Electrical Engineering	Mentor No. 10
Joshua G. Mangelson	UT B '14	Electrical Engineering	Record No. 847
Nathaniel R. Marchant	UT B '14	Chemical Engineering	Record No. 848
Walid Mefteh	CA H '14	Software Engineering	Forge No. 16
Shivani S. Mehta	GA A '14	Electrical Engineering	Bose No. 7
Jorge D. Mena	GA A '14	Biomedical Engineering	Record No. 849
Vincent J. Micek	IL Δ '14	Civil Engineering	Record No. 850
Aaron J. Miller	UT A '14	Bioengineering	Record No. 851
Jacob D. Miller	OH N '14	Mechanical Engineering	Stabile No. 222
Amani U. Moin	CO Δ '14	Chemical and Biological Engineering	Record No. 852
Jacob P. Monagle	AK A '14	Electrical Engineering	Record No. 853
Joshua D. Moon	AL B '14	Chemical Engineering	Record No. 854
Benjamin H. Morrell	UT B '15	Chemical Engineering	Record No. 855
David P. Mysona	SC B '14	Biomedical Engineering	Record No. 856
Jay C. Nair	ID A '14	Mechanical Engineering	Stabile No. 223
Connor P. Nash	CO Δ '14	Chemical and Biological Engineering	Record No. 857
Ashley N. Ng	OH B '14	Chemical Engineering	Record No. 858
Kara L. Ninke	CO A '14	General Engineering	Schwaller No. 3
Adesuwa Nosakhare	MD Δ '14	Chemical Engineering	Dodson No. 54
Thomas J. Notchick	MA I '14	Electrical Engineering	Record No. 859
Max L. Olender	MI Γ '15	Mechanical Engineering	Stabile No. 224
Ahmad H. Omar	AL E '15	Civil Engineering	Record No. 860
Kevin T. Orbine	NJ B '14	Mechanical Engineering	Stabile No. 225
Jose L. Ortiz-Rosero	MA A '14	Industrial Engineering	Stabile No. 226

RECIPIENT	CHAPTER	FIELD OF STUDY	SCHOLARSHIP
Edward J. Overy	UT B '14	Chemical Engineering	Record No. 861
Tawni M. Paradise	CA E '15	Industrial and Systems Engineering	Forge No. 17
Melanie R. Payne	SC A '14	Civil Engineering	Record No. 862
Hector D. Perez Parra	UT B '14	Chemical Engineering	GEICO No. 36
Kevin A. Perkins	UT B '14	Electrical Engineering	Record No. 863
Ethan R. Perry	MT A '14	Mechanical Engineering	Stabile No. 227
Kristen L. Perry	OK Γ '13	Civil Engineering	Record No. 864
Sarah A. Perry	AL A '14	Industrial Engineering	Stabile No. 228
Thomas A. Peterson	MN A '15	Mechanical Engineering	Stabile No. 229
Jeffrey W. Pettyjohn	GA A '14	Electrical Engineering	Record No. 865
Cody R. Phelps	CA Λ '14	Civil Engineering	Forge No. 18
Wiphawi S. Phifer	SD B '14	Civil Engineering	Record No. 866
Vinh T. Phung	TX E '14	Computer Engineering	Record No. 867
Jessica M. Piper	AZ B '14	Chemical Engineering	GEICO No. 37
Christopher V. Poulton	CO B '14	Electrical and Computer Engineering	Record No. 868
Samuel M. Prentiss	ME A '14	Mechanical Engineering	Stabile No. 230
Aaron Z. Priluck	MI Γ '15	Chemical Engineering	GEICO No. 38
Srinidhi J. Radhakrishnan	CO B '14	Chemical and Biological Engineering	Record No. 869
Karly D. Rager	IA A '14	Civil Engineering	Campbell No. 28
Juan D. Ramirez	FL E '16	Ocean and Electrical Engineering	Stabile No. 231
Hilary L. Ramseier	MT B '14	Petroleum Engineering	Dodson No. 55
Jonathan P. Reardon	VA Δ '14	Mechanical Engineering	Stabile No. 232
Matthew F. Reardon	VA Δ '14	Civil Engineering	Record No. 870
Victor M. Rosario-Melendez	PR A '14	Mechanical Engineering	Stabile No. 233
Hannah K. Ross	TN Γ '14	Mechanical Engineering	Stabile No. 234
Jason A. Ross	NY N '15	Chemical Engineering	GEICO No. 39
Ryan L. Rossiter	SD B '14	Computer Science and Engineering	Record No. 871
Noah T. Sandoval	CO Δ '13	Engineering Science	Record No. 872
Justine E. Schaper	MO A '14	Mechanical and Aeronautical Engineering	Stabile No. 235
Eric S. Schlabs	DC Γ '14	Civil Engineering	Record No. 873
Daniel E. Schwab	IA A '14	Construction Engineering	Record No. 874
Jordan M. Senff	ND B '15	Mechanical Engineering	Stabile No. 236
Caroline E. Seng	NC Γ '14	Biomedical Engineering	Record No. 875
Neel P. Shah	MA E '15	Electrical Engineering	Record No. 876
Nathan M. Shay	OH I '14	Civil Engineering	Record No. 877
Scott R. Sheahan	UT B '15	Mechanical Engineering	Stabile No. 237
David L. Smith	KY A '14	Mechanical Engineering	Stabile No. 238
Michelle J. Song	OH A '15	Polymer Science and Engineering	Record No. 878
Cassandra K. Stallbaumer	KS Γ '14	Architectural Engineering	Fife No. 21
Kristin M. Stewart	KS Γ '14	Architectural Engineering	Fife No. 22
Janelle Strampe	SD A '14	Chemical Engineering	GEICO No. 40
Bryan J. Stringham	UT Γ '14	Mechanical Engineering	Stabile No. 239
Phoebe Sulzen	CA I '14	Mechanical Engineering	Forge No. 19
Steven R. Sundberg	WY A '14	Mechanical Engineering	Stabile No. 240
Ki-Joo Sung	MI Γ '15	Chemical Engineering	GEICO No. 41
Peter Sutor	PA B '14	Computer Science	Record No. 879
Divyagash Swargaloganathan	NJ B '14	Biomedical Engineering	Record No. 880
Brian P. Tallman	MN B '14	Mechanical Engineering	Stabile No. 241
Patrick T. Tate	MT A '14	Chemical Engineering	GEICO No. 42
Lily M. Thomas	MA Z '13	Mechanical Engineering	Stabile No. 242
Robert L. Thomas	AL B '14	Chemical Engineering	Record No. 881
Sarah E. Thomson	MA A '14	Mechanical Engineering	Stabile No. 243
Tam T. Tran	TX B '14	Petroleum Engineering	Mitchell No. 4
Brandon J. Tripp	AL Γ '14	Civil Engineering	Record No. 882
Chi H. Truong	ME A '14	Chemical Engineering	Record No. 883
Kyle S. Tyson	LA E '14	Naval Architecture and Marine Engineering	Stabile No. 244
Allen L. Vanmeter	OH A '15	Biomedical Engineering	Record No. 884
Tyler A. Voegele	ND B '14	Mechanical Engineering	Stabile No. 245
Justen K. Vrabel	OH Λ '14	Mechanical Engineering	Hart No. 1
Said Mansoor Wahab	CA Λ '14	Computer Engineering	Forge No. 20
Robert R. Waked	OH Θ '15	Chemical Engineering	Record No. 885
Ryan T. Whelchel	KS Γ '15	Architectural Engineering	Fife No. 23
Luke Wilson	SD A '14	Mechanical Engineering	Stabile No. 246
Elissa K. Wolf	PA Δ '14	Computer Science and Engineering	Record No. 886
Stephen J. Wood	UT B '13	Electrical Engineering	Record No. 887
Rebecca Wozniak	NY Γ '14	Biomedical Engineering	Record No. 888
Wells Yang	GA A '14	Biomedical Engineering	Record No. 889
David L. Yoder	OH N '14	Mechanical Engineering	Stabile No. 247
Jennifer S. Youngpeter	AL E '14	Chemical Engineering	Record No. 890
Chih-Chieh Yu	PA Λ '14	Bioengineering	Record No. 891
Xing J. Zhong	CO B '14	Electrical and Computer Engineering	Record No. 892

Philip M. Albu, Record Scholar No. 789
Phil is a computer science major at South Dakota State University, with minors in software engineering and mathematics. He is a NCAA Div. 1 student-athlete, swimming for the SDSU swim & dive team, holding team records in the 50, 100, and 200-yard backstroke. Phil is interning with Daktronics and will pursue a computer engineering master's.

R. Blake Alexander, *Sickafoose Sch. No. 1*
Blake is a chemical engineering student at Northwestern University and is also completing a managerial analytics certificate through the Kellogg School of Management. A former Eagle Scout, he is TBP chapter president. He has worked in software development for the military and petroleum refinement catalyst development.

Malia B. Amling, *Record Scholar No. 790*
Malia is majoring in electrical engineering at Cedarville University. She has been part of the robotics team and the supermileage team, which competes in the Shell eco-marathon. Through her numerous class projects, competition teams, and internships, Malia is certain to enjoy her future career in the field of electrical engineering.

Robert T. Andon, *Nagel Scholar No. 41*
Robert majors in systems engineering at The United States Naval Academy. He is also involved in the Society of American Military Engineers and will serve as brigade executive officer next semester at Annapolis. Robert's goal upon graduation is naval aviation and he intends to continue his engineering studies while in the military.

Alexandra M. Arambula, *Nagel Sch. No. 42*
Alexandra is entering her fifth year at the University of Texas at Austin as a double major in biomedical engineering and Plan II Honors. She will complete a thesis concerning protein engineering for cancer therapeutics this year and plans to attend medical school. She is interested in a surgical specialty, clinical research, and a career as a physician.

Kayla S. Arruda, *Record Scholar No. 791*
Kayla is a civil engineering major at Northeastern University, where she is a resident assistant for freshmen engineering students. Kayla has completed co-ops at Simpson Gumpertz & Heger and Dewberry. She has bridge inspection experience and would like to learn about bridge design at her final co-op. Kayla hopes to earn a master's in structural engineering.

Arslan Arshad, *Record Scholar No. 792*
Arslan is majoring in chemical and biomolecular engineering with minors in biomedical sciences and physics at the University of South Alabama, where he ranks first in his class. Arslan is a Goldwater Scholar who enjoys traveling, playing soccer, reading, and is interested in translational biomedical engineering research. He plans on pursuing a career in medicine and research.

Peter M. Attia, *Record Scholar No. 793*
Peter is studying chemical and biomolecular engineering at the University of Delaware. He has done research in materials science and interned at DuPont. He is interested in problems relating to alternative energy and fresh water access. After graduation, Peter will likely pursue graduate studies in materials science or chemical engineering.

Julia A. Baaklini, *Campbell Scholar No. 27*
Julia is a civil engineering major at The College of New Jersey. She has been interning at Langan Engineering in the site/civil division. At school, she is president of her student chapter of the American Society of Civil Engineers and vice president of Society of Women Engineers. Julia hopes to pursue a graduate degree in geotechnical engineering and enter the workforce.

A. Taylor Baldwin, *Record Scholar No. 794*
Taylor is an electrical engineering major at Valparaiso University, where he ranks first in his class and group with a 4.0 G.P.A. He also is pursuing an associates degree in humanities from the honors college. Taylor has had several internships with the Department of Defense and plans on applying to graduate school in nuclear engineering, with a focus on reactor design.

Madelyn R.B. Ball, *Record Scholar No. 795*
Madelyn is a chemical engineering major at the University of New Hampshire. She is an Engineers Without Borders chapter president and traveled to Uganda to work on a potable water project. She has a variety of research experiences, including an internship at the National Renewable Energy Lab in CO. Upon graduation, she plans to pursue a Ph.D. in the area of bioenergy.

Matthew W. Barnett, *Stabile Sch. No. 193*
Matthew is a mechanical engineering major at the University of South Alabama and first in his class. His research this summer involved developing new manufacturing methods for composite materials. Matthew has joined Airbus as an intern and hopes to secure a full-time position upon graduation. He also plans on obtaining a master's degree.

Odkhuu Batmunkh, *Forge Scholar No. 11*
Odkhuu is a software engineering major at San Jose State University. After receiving his B.S., he plans to work at local startups in the Silicon Valley to gain experience. He also plans to pursue an M.S. in software engineering, specializing either in enterprise software technologies or in software systems engineering. He is interested in quality assurance, game development, and mobile applications.

Jennifer L. Batt, *Record Scholar No. 796*
Jennifer is a civil engineering major at California State University, Sacramento, where she ranks in the top 1% of her class. After graduation, she plans to start a career in water resources working with the company where she is employed. She also aims to gain the experience necessary to pass the P.E. exam and aspires to motivate women to become involved in the fields of engineering and mathematics.

Grant H. Bauer, *Record Scholar No. 797*
Grant is majoring in aerospace engineering & mechanics at the University of Minnesota-Twin Cities, with a minor in astrophysics. He has interned with Boeing Commercial Airplane and plans to return as a full-time employee upon graduation. After working in industry for a few years, he would like to pursue a grad degree in aerospace and eventually get an MBA.

Joanne K. Beckwith, *Record Sch. No. 798*
Joanne is a chemical engineering major at the University of Toledo. She is a member of the ballroom dance society and works as an orientation leader. She has co-oped at the Ashtabula Complex of Cristal and performed undergraduate research on drug delivery systems. She plans to attend graduate school to obtain a Ph.D. in chemistry.

Kelly L. Benton, *Scribner Scholar No. 21*
Kelly is majoring in environmental engineering at Montana Tech and working toward the five year master's program, with a minor in mathematics. She has worked as a supplemental mathematics instructor. Kelly worked on a research project using baby hairs as indicators of toxic elements in the environment. She hopes to earn an internship in the environmental field.

R. Adam Bilodeau, *Stabile Scholar No. 194*
Adam is studying mechanical engineering at Brigham Young University. He is performing research in materials sciences and wants to pursue graduate studies in the field of compliant mechanisms. His main interests are machine design and structural stress analysis. He also volunteers as a Spanish interpreter and recently traveled to Guatemala as an interpreter for a medical team.

Collin S. Black, *Record Scholar No. 799*

Collin is a chemical engineering major at Brigham Young University. He works in a research lab studying the pathogenesis of osteoarthritis, using mouse models. Collin works as a teaching assistant for a chemical process principles class. He serves in the leadership of the university's BME club and enjoys learning about the role engineering has in biomedicine. He plans a career in the medical field.

Nicole L. Black, *Record Scholar No. 800*

Nicole is a biomedical engineering major and mechanical engineering minor at Boston University. Her interests include tissue engineering, nanotechnology, and K-12 STEM education. She has participated in summer research at Vanderbilt Univ. & Columbia Univ. Nicole is a member of the Technology Innovation Scholars program. Her plans include graduate school focusing on regenerative medicine.

Matthew R. Boler, *Soderberg Sch. No. 19*

Matthew is a mechanical engineering major at Florida State University. He is active in AIAA, ASME, and Pi Tau Sigma and is TBP president for the 2013-14 school year. He is currently enrolled in a B.S. & M.S. program and will finish his educational career in the spring of 2015. Upon completion of his degrees, he plans to start his career in the aviation industry.

Spencer H. Bowen, *Record Sch. No. 801*

Spencer is double majoring in chemical engineering and Chinese at Brigham Young University. Professionally bilingual, he completed a semester at Nanjing Univ. and a four month internship at the Celanese Nanjing manufacturing facility. He has completed four internships with Celanese and plans to work as a production engineer in the emulsion polymers business line after graduation.

Benjamin D. Braun, *Stabile Sch. No. 195*

Ben is a mechanical engineering major at The University of Kansas and first in his class with a 4.0 G.P.A. His extracurricular activities include Formula SAE Suspension team leader, SELF Engineering Leadership Fellow, Vintage Church community service team, wakeboard club, and sailing club. After graduation, he plans to pursue a career in product development.

Sean R. Brown, *Record Scholar No. 802*

Sean is a mechanical engineering student at Brigham Young University. He is involved in an entrepreneurship program and has done research on corporate innovation strategies. He spent three summers interning for Eaton's hydraulic and truck groups. His plans are to pursue their two-year rotational leadership development program and then return to school for a joint MBA and JD.

Shannon B. Brown, *Record Sch. No. 803*

Shannon is a biological engineering major with biomechanics and nutrition minors at the University of Florida. She is TBP chapter Vice President. Her true passion is biomedical engineering with human applications. Shannon interns at a company that processes human bone and tissue for life restoring surgeries. She will pursue a Ph.D. in biomedical engineering to perform quality of life research.

Joshua D. Bryan, *Scribner Scholar No. 22*

Josh is a civil engineering major at Ohio Northern University, enrolled in the honors program and completing a business minor. He is the treasurer for his TBP chapter. Josh is also a two-year letter-winner in football and has traveled internationally on three mission trips to work on engineering projects. After graduation, Josh plans to join his family construction business in Pittsburgh, PA.

Ethan L. Budreau, *Stabile Scholar No. 196*

Ethan is a mechanical engineering student at The University of Iowa. He is passionate about solving problems, helping people, and his family and dogs. His activities include membership in TBP and ASME as well as entrepreneurship, volunteering, and assistant teaching. He plans to become an entrepreneur after graduation and build a successful business and give back to the community.

Annicka K. Carter, *Record Sch. No. 804*

Annicka is a biomedical engineering major at the University of Utah and participates in organizations such as the bioengineering undergraduate committee, student BMES club, and the university student government. She works in the artificial heart program at Intermountain Medical Center in clinical research and patient care. She plans to pursue a Ph.D. in BMS and research in medicine.

Laiara R. Cerri, *Record Scholar No. 805*

Laiara is majoring in civil engineering at Manhattan College, where she is a Chi Epsilon chapter officer and volunteers at the engineering tutoring center. She is interning at an international engineering firm and hopes to work there full-time after graduation. After graduate school for structural engineering, she hopes to gain experience traveling around the world.

Amanda Chen, *Record Scholar No. 806*

Amanda is a biomedical engineering major with a minor in chemical engineering at the University of Rochester and ranks first in her class. A Goldwater Scholar, Amanda is TBP chapter president. She plans to pursue a Ph.D. to study drug delivery systems and to build a career in academia.

B. Dennis Chua, *Record Sch. No. 807*

Dennis is a chemical engineering major at Cornell University and first in his class. He is the TBP chapter president and Base Productions Dance Group president. His achievements include the President's volunteer service award, national champion in The Mathematical Contest in Modeling, and winner of the IBM Watson Case Competition. He plans to pursue a MEng after graduation.

Michael B. Cloward, *Stabile Sch. No. 197*

Michael is a mechanical engineering major at Brigham Young University and first in his class. He is TBP chapter vice president and recently held the position of external relations co-chair for the biomedical engineering club. He is working as an intern at GE Healthcare and plans to pursue a master's degree in mechanical engineering starting fall of 2014.

Briana A. Conners, *Webster Scholar No. 1*

Briana studies chemical engineering at the University of Cincinnati and will also graduate with a master's of engineering. She enjoys leading the club swim team and working on projects for Process Plus, an engineering firm. Upon graduation, she hopes to pursue a Ph.D. or a career as a process engineer.

Guy J. Cordonier, *Stabile Scholar No. 198*

Guy is a mechanical engineering major with a minor in physics at West Virginia University. He is an active member in ASME and secretary of AIAA and has also performed outreach in South Africa and Malawi. He has worked on research in material science and nanotechnology, as well as microgravity exploration with NASA. He plans to pursue a doctorate in material science.

Turner L. Cotterman, *Record Sch.No. 808*

Turner is studying electrical engineering at Clemson University. He is active on campus in student government, Triangle Fraternity, and German Professional Society. His passion lies in renewable energy systems, and he is conducting research on modeling electrical loads into a zero-energy infrastructure. After graduation, he hopes to attend graduate school to pursue energy technologies.

J. Alexander Cranney, *Stabile No.199*

Xan is a mechanical engineering major at Brigham Young University with minors in economics and music and will later pursue master's degrees in business and ME. He has a variety of interests, including biomedical & traffic engineering and energy. He is also interested in cogeneration, combining electricity generation with heating in a single device.

Bria O'Lisa Crawford, *Record No. 809*

Bria is a civil engineering major at Howard University and ranks first in her department. She is involved with multiple campus organizations, including Phi Sigma Rho, ASCE, SWE, and NSBE. Bria has worked as an undergraduate researcher and an intern for three summers. She plans to pursue a Ph.D. in environmental engineering and help address issues in water quality.

Andrew J. Creighton, *Record No. 810*

Andrew is a double major in aerospace engineering and political science, with a minor in mathematics and a certificate in international studies from Arizona State University. Andrew works as a teaching assistant, an engineering tutor, and with faculty in designing & drafting aircraft policy. He has an internship with Boeing and hopes to obtain a full-time position while completing a master's in MEng.

William Austin Curbow, *Record No. 811*

Wm. Austin is pursuing a bachelor's degree in electrical engineering at the University of Arkansas, where he is ranked first in his class. He has been researching on power electronics and interning at a robotics company. His interests include control systems and electronic circuit design. He plans to continue his education with a master's in control systems engineering.

Nathaniel L. Decker, *Record No. 812*

Nathaniel is a civil engineering major at Utah State University. He plans to pursue graduate studies focused on structural engineering. He is interning at a consulting engineering firm and looks forward to becoming a licensed S.E. Nathaniel hopes to contribute to the advancement of more sustainable structures in America and abroad.

Danielle M. Defeo, *Stabile No. 200*

Danielle is a mechanical engineering major at Stevens Institute of Technology, where she will also earn her master's. She is a four-year varsity athlete in softball and dedicates many hours towards community service. She has been treasurer and sectional co-chair for the APO service fraternity as well as an SGA senator. Danielle will pursue a career in product design and development.

Tyler A. Dell, *Record No. 813*

Tyler is majoring in civil engineering at Colorado State University. He is involved in organizations including Chi Epsilon, the National Society of Collegiate Scholars, and the Navigators. After graduation, he hopes to work as a water resource engineer in CO while acquiring his P.E. license. After which, he hopes to travel to developing countries to help improve the availability and quality of water.

Brandon M. Demerath, *Stabile No. 201*

Brandon is majoring in mechanical engineering at The University of Iowa. His extracurricular involvement includes being secretary of the UI American Institute of Aeronautics and Astronautics, an undergraduate teaching assistant, and a volunteer at the local Newman Center. After graduation, he plans to pursue a master's degree at The University of Iowa.

Nathaniel R. Devoe, *Stabile No. 202*

Nate is studying mechanical engineering with a minor in mathematics at the University of Maine. He is interning at Texas Instruments working on robot optimization in manufacturing. Nate is TBP chapter president and team member for the UMaine Hoverbike. He will pursue a master's degree in mechanical engineering design and would like to design mountain bikes or vehicles.

Sydnee B. Dieckman, *Record No. 814*

Sydnee is pursuing a bachelor's in civil engineering at Washington State University, with a minor in Japanese. Sydnee has been a co-op at Puget Sound Naval Shipyard and plans to convert to full-time employment at U.S. Fleet Activities Yokosuka in Japan after graduation. She is considering pursuing a master's degree in structural engineering after returning from Japan.

Sarah E. Divel, *Record No. 815*

Sarah is majoring in electrical engineering at the University of Notre Dame, where she serves as TBP vice president. She conducts research in CT reconstruction and has spent two summers interning at GE Healthcare in WI. These experiences have deepened her passion for healthcare and she plans to utilize her education in the healthcare industry while pursuing her master's.

Ria C. Domier, *Record No. 816*

Ria is majoring in chemical engineering at the University of Alabama. She is a two-time NCAA national champion as a member of the gymnastics team. Ria is a campus officer for SWE and conducts undergraduate research. She plans to pursue a Ph.D. in chemical & biological engineering, research in tissue engineering, and teach at the university level.

Matthew O. Duffield, *Stabile No. 203*

Matt is a mechanical engineering major at Brigham Young University. He is involved in research projects to develop cleaner cook stoves and more efficient housing for the developing world. He plans to pursue a master's degree and an MBA. After graduation, he looks forward to working in industry, serving in the community, and raising a family.

Kevin T. Eck, *Stabile No. 204*

Kevin is a mechanical engineering major pursuing a dual bachelor's and master's degree at Mercer University, where he ranks first in his class. He seeks to use the abilities and opportunities he has been given to benefit others through his career. After graduation, he is deciding between going into industry or continuing his education with an MBA or Ph.D. He is also getting married this summer.

John F. Edelbrock, *Curtis No. 6*

Jack is a senior polymer science and engineering student at Case Western Reserve University and first in his class. He presented his most current project, on therapeutic protein delivery, at the national meeting of the American Chemical Society. Jack will pursue a graduate degree in biomedical engineering.

Youssef M. Elkady Jr., *Dodson No. 51*

Youssef is a petroleum engineering major at The University of Texas at Austin and among the first in his class with a 4.0 G.P.A. He is involved in intramural soccer and squash tournaments. Youssef is interning this summer in the SURI research program at UT and is applying for graduate school to fulfill his passion in becoming an expert in thermal enhanced oil recovery.

Charles E. Elliott III, *Record No. 817*

Chad is majoring in mechanical engineering at the University of South Alabama, where he ranks first in his class with a 4.0 G.P.A. He has gained research experience studying functionally graded materials. He is an intern at Airbus, where he works within the A380 linings design group. As a result, he plans to pursue graduate studies in aerospace engineering.

Elizabeth M. Fischer, *Stabile No. 205*

Beth is pursuing a bachelor's and master's in mechanical engineering at the Rochester Institute of Technology. She plans to graduate next spring and begin working in industry. She enjoys lean process development, as well as heat transfer and computational fluid dynamics, and would like to work in these areas.

Joshua K. Fleming, *Record No. 818*

Josh is an electrical engineering major at Cedarville University. He will further his education in engineering and business at the graduate level. Josh has taken advantage of several opportunities as a resident assistant, TBP chapter president, IEEE class officer, intramural sports, avid rock climbing, and three summer engineering internships.

Casey M. Fontana, *Record No. 819*

Casey is a civil engineering major at The College of New Jersey. She is the TBP chapter vice president and also active in the American Society of Civil Engineers and the Society of Women Engineers. She has participated in summer research focused on fiber reinforced polymer composites and hopes to pursue a career in architectural engineering after graduate study.

Christopher W. Fox, *Stabile No. 206*

Chris is a mechanical engineering major at Cedarville University, where he has been a starting catcher for the baseball program. He enjoys the hands-on aspect of the engineering roll and the intellectual challenges it presents. Chris is also a member of Cedarville's SAE Aero Design team. He is interning at Cummins Inc., where he hopes to pursue a career after graduation.

Joy A. Franco, *Forge No. 12*

Joy is majoring in mechanical engineering at San Jose State University. She is a dean's scholar, a research fellow in the Wilkinson Neurophysiology lab, SJSU Salzburg Scholar, and a multi-year SWE officer. She plans doctoral studies focused on applying mechanical engineering to curing human disease states. Joy also works to combat gender bias, promote education, and develop global citizenships.

Joshua D. Frash, *Record No. 820*

Josh is studying chemical engineering at Ohio University, where he is TBP chapter president and a member of AIChE. He also remains active in his local church and mentors undergraduates. Josh is working at DuPont in Washington, WV, this year and plans to enter manufacturing industry or become a high school chemistry teacher.

Ethan C. Fryer-Ressmeyer, *Record No. 821*

Ethan is majoring in aerospace engineering and mechanics at the University of Minnesota-Twin Cities. He has been involved on campus primarily as president/treasurer of the sailing team and working as an experimental physics lab assistant. He interned this past summer at Boeing and intends to continue that path after graduation.

Eric G. Fuller, *Record No. 822*

Eric is studying chemical engineering at Brigham Young University and will graduate in April 2015. He researches shale oil pyrolysis and this summer had an internship with Procter & Gamble Paper Products in Utah. Eric plans to attend grad school and is also training in order to make the BYU varsity track team.

Hang Gao, *Stabile No. 207*

Hang is a mechanical engineering major at The University of Iowa, where he ranks first in his class and group with a 4.0 G.P.A. He is involved in research and in student organizations that have helped him develop his passions and plans for after graduation. He plans to enter the workforce but intends to pursue a graduate degree in the future.

Robert A. Gentile, *Stabile No. 208*

Robert is pursuing a degree in mechanical engineering and a minor in business management at the Milwaukee School of Engineering. He was awarded a full tuition grant to pursue a master's in engineering management. After graduate school, he hopes to work in either the automotive or energy industries.

Justin M. Gerber, *Record No. 823*

Justin is pursuing an aerospace engineering degree with a minor in Homeland Security at Embry-Riddle Aeronautical University where he is TBP chapter president. He enjoys spending his free time working at the ERAU Eagle Flight Research Center and participating in various unmanned aircraft research projects. He currently works for a defense contractor.

Nicholas D. Glynn, *Record No. 824*

Nick is majoring in chemical engineering at The University of Iowa. He plays trombone in the Hawkeye Marching Band and has been active with roles in associated residence halls. Nick has been involved with Omega Chi Epsilon, AIChE, and the grand challenges for engineering program. He plans on obtaining a master's degree in either chemical or nuclear engineering.

Albert R. Gnadt, *Stabile No. 209*

Albert is majoring in mechanical engineering with certificates in business and thermal energy at The University of Wisconsin-Madison. He has been involved in TBP and ASME, along with intramural soccer and dodgeball. For two summers, Albert has worked with GE Healthcare in WI. After graduation he expects to start in a rotational program.

Jillian K. Gorski, *Record No. 825*

Jillian is majoring in bioengineering at the University of Pittsburgh. She works as an undergraduate researcher focused on evaluating stem cell sources for regenerative medicine. She is active in science and literature outreach for middle school students. She plans to pursue a medical degree and a career in academic medicine.

Jenafer L. Graham, *Kolff van Oosterwijk No.5*

Jena is a computer science and mathematics major at the University of Portland. She plans to gain industry experience upon graduating while following her passion to generate interest for young women to pursue a career in STEM fields. She is president of her university's SWE chapter, a member of the UP honor's program, and enjoys application development and design.

Tawna M. Groom, *Record No. 826*

Tawna is a civil engineering major at Boise State University. She has held leadership positions in TBP, Sigma Lambda Chi, SWE, and EWB and is involved with ASCE. She is an avid football fan and participated in the marching and pep bands. Her summer internship helped establish her goals to pursue graduate studies and obtain her

R. Jordan Hall, *Record No. 827*

Jordan is majoring in bioengineering at Clemson University. He is an undergraduate researcher, active in his church, athletics, and the community. After graduating he plans a year of service abroad before attending medical school. His career aspiration is to practice medicine in Third World countries.

Zachary A. Hamann, *Stabile No. 210*

Zachary is majoring in mechanical engineering at the University of North Dakota where he ranked first in his class with a 4.0 G.P.A. He is working under a NASA research fellowship in the space studies department, as well as an internship at Cirrus Aircraft. His senior design project will be the Formula SAE design competition.

Abraham W. Hamilton, *Stabile No. 211*

Abraham is a mechanical engineering major and a member of the honors college at the University of Maine. He is ranked first in his class with a 4.0 G.P.A. Abraham has plans of entering industry for a few years before pursuing an MBA. His long term plan is to integrate his technical education with his interest in international business administration.

Erika D. Handly, *Record No. 828*

Erika is an honors student in chemical engineering at Brigham Young University. She works in two research labs on targeted drug delivery and improving catalyst design. She interned at Hokkaido Univ. in Japan testing diabetes treatments and studied cancer cell metabolism at UCSD. Erika is a SWE secretary and plans to pursue a Ph.D. in BME.

Jared Hing-Lum Hara, *Forge No. 13*

Jared is majoring in bioengineering at Santa Clara University. He is involved with research in 3D cell toxicology and works on a transdermal patch. He is co-chair of the Chinese Student Assoc., treasurer of the pre-health club, and president of the Jiu Jitsu club. Jared spent the summer at Shanghai Jiao Tong Univ. as a fellow. He will pursue a MD in medical research.

Mark G. Harries, *Stabile No. 212*

Mark is a mechanical engineering major at the University of North Dakota. He is on the track and cross country teams, involved in volunteering engineering students, and involved at the Newman Center on campus. He has interned at Emerson Rosemount in MN for two summers and plans to seek employment after graduation. Mark hopes to work towards either a master's or an MBA.

Kazi Y. Helal, *Bloomberg No. 7*

Kazi is a chemical & biomolecular engineering major with a philosophy minor at the Polytechnic Institute of New York University. He has done research in a protein engineering lab and served as the AIChE chapter president for 2+ years. This summer, he is interning at ExxonMobil. For the future, he plans to pursue a Ph.D. in chemical engineering focusing on biofuels.

Clarissa L. Hernandez, *Record No. 829*

Clarissa is a chemical engineering major at the University of South Alabama. She is a member of the varsity women's soccer team, president of AIChE, and a research assistant in a bioimaging lab. Clarissa will pursue a doctorate in biomedical engineering and plans to participate in tissue engineering research and eventually work for a biotechnology company.

Logan D. Hopper, *Alabama Power No. 10*

Logan is a mechanical engineering student at the University of Alabama. He is involved in aerodynamics & industrial research projects and is the TBP chapter vice president. Logan studied Spanish and environmental technology in Spain this summer and plans to apply for grad school. He will pursue a career in renewable energies or sustainable manufacturing practices.

David L. Hutchins, *Scribner No. 23*

David is pursuing a degree in environmental engineering from Montana Tech of The University of Montana. He is a dedicated father and an inspired inventor. He has a passion for sustainable design. He plans to apply his skills close to home, problem solving local environmental challenges.

Ellen M. Ibister, *Stabile No. 213*

Ellen is a mechanical engineering major at the University of Minnesota, Duluth. She is the President of the UMD Scholars Club and enjoys her roles as commanding officer of the pep band and drum major of the marching band. Upon graduation, she plans to attend graduate school to pursue a master's degree in product design engineering.

Joshua D. Jacobson, *Record No. 830*

Josh is a computer engineering major at Northwestern University and passionate about innovative technology, entrepreneurship, and music. He is gaining professional experience as a project manager intern at Groupon and looks forward to pursuing a career in the tech industry after graduating. Josh is also a pianist, singer, and composer.

Trevor C. Jobst, *Stabile No. 214*

Trevor is a mechanical engineering major at Montana State University. He is an avid outdoor enthusiast and guide for backpacking and mountaineering trips in the summer. In the future, he hopes to combine his interests and work as a design engineer for a climbing/outdoor sports company.

Benjamin R. Johnson, *Stabile No. 215*

Ben is an industrial engineering major at the South Dakota School of Mines & Technology. He has been interning with Caterpillar Inc. in their parts distribution division, focusing on spreadsheet programming and data analysis. He is also president of his IIE chapter. His goal is to pursue a graduate degree in engineering management.

Jennifer N. Johnson, *Forge No. 14*

Jennifer is studying computer engineering at University of the Pacific and has been interning at Intel in the architecture design group. She recently published a paper in the IEEE ISSNIP Conference and won the SWE's national poster competition. Jennifer is a senior research assistant in the field of sensor networks and hopes to obtain a job at Intel after school.

Kati J. Johnson, *Stabile No. 216*

Kati is a chemical engineering major and first in her class at South Dakota School of Mines & Technology, where she is TBP chapter president. She plans to obtain experience in industry as a process engineer prior to pursuing a graduate degree in materials engineering. As a member of Engineers & Scientists Abroad, she hopes her career allows her to help the less fortunate.

Kevin R. Johnson, *Record No. 831*

Kevin is majoring in biomedical engineering at The University of Iowa focusing on cardiovascular biomechanics. This summer as a researcher, he examined cerebral vasculature with computational fluid dynamics. After graduation, he plans to pursue a master's degree in BME to experience more of the academic/research culture before entering the medical device industry.

Joshua D. Jones, *Stabile No. 217*

Joshua is a 3rd year mechanical engineering major at the Georgia Institute of Technology and ranks first in his class with a 4.0 G.P.A. His involvement outside of Tau Beta Pi includes serving as a supreme justice on the undergraduate judiciary cabinet and as a teaching assistant. Internships have included the U.S. Army Corps of Engineers.

Tyson D. Kesler, *Stabile No. 218*

Tyson is majoring in mechanical engineering at Utah State University. He is the TBP chapter recording secretary. He has completed multiple internships in the mining industry. He enjoys computer modeling and performing failure analysis. Tyson plans to obtain a master's degree in mechanical engineering and to get a job in the mining or oil industry.

Sara A. Khalek, *Record No. 832*

Sara is majoring in biomedical engineering at Georgia Tech. She is involved as a senior web designer of *Pioneer Newsletter*, a teacher assistant and mentor for students, and a neuroscience researcher. Sara is interning at Global Center for Medical Innovation and learning medical equipment design innovation. Her career goals include working in medical design industry and grad school.

Seth Kijewski, *Stabile No. 219*

Seth is majoring in mechanical engineering at South Dakota School of Mines and Technology. He is part of the Professional Development Institute for Student Leaders and serves as a Resident Assistant. He plans to earn a master's degree in aerospace engineering. After grad school, his goal is to work on military aircraft in the U.S. or commercial aircraft in England.

Claire E. Kilmer, *Dodson No. 52*

Claire is a chemical engineering major at North Carolina State University, where she is also a member of the marching band. She plans to pursue a doctorate upon graduation in biological or tissue engineering. She would like to do research in the field of personalized medicine with a pharmaceutical company in the future.

Anna D. Koch, *Althouse No. 5*

Anna is majoring in electrical & computer engineering at Oregon State University focusing on power systems and is active in Phi Sigma Rho. This fall she will complete her second MECOP internship at Brown and Caldwell in WA. After graduating, whether she starts grad school or a career, she wants to continue to support women in engineering, play soccer, and ride her bike.

Daniel P. Koch, *Stabile No. 220*

Daniel attends Brigham Young University majoring in mechanical engineering with a minor in computer science. He has been involved with research in computational materials science and is now researching the control and guidance of miniature unmanned air vehicles. After completing his degree, he plans to pursue a Ph.D. and specialize in control theory and design.

Reed A. Kopp, *Record No. 833*

Reed is majoring in aerospace engineering at Pennsylvania State University and ranks first in his class. He is chapter president of the National Aerospace Engineering Honor Society. He has interned with The Boeing Co. as a designer and structural analyst for the 787 program. He plans to pursue a master's degree while working in industry.

Garrison B. Kubis, *Record No. 834*

Garrison is majoring in computer science at the University of Minnesota-Twin Cities. He is a varsity member and treasurer of the men's crew team. He has an internship with Epic Systems developing healthcare software. Upon graduation he plans to enter industry and discover a career where he can combine his computer science degree and passion for music.

Linda C. Kuenzi, *Record No. 835*

Linda is an aerospace engineering major and honors student at Arizona State University, where she also competes in the pole vault on the track & field team. Her career goal is to contribute to manned or robotic missions for space exploration. She would like to travel abroad given her interests in language and culture. She plans to work in industry before pursuing a graduate degree.

Neeldev Kunjur, *Record No. 836*

Neel is an electrical engineering major at Northwestern University. He is interested in the fields of computer vision and signal processing and hopes to one day contribute something groundbreaking to the field of image and video processing. In his spare time he enjoys meeting new people and playing sports.

Aimee V. Kuntz, *Dodson No. 53*

Aimee is majoring in petroleum engineering at Montana Tech of The University of Montana. She is an active member in the Society of Petroleum Engineers and in SWE. She hopes to receive an internship with an oil & gas company next summer to gain experience and knowledge in the field. Aimee aspires to be a reservoir engineer.

Michael A.A. Kuprenas, *Record No. 837*

Mikas is double majoring in chemical engineering and music performance at the University of South Carolina. He is a third-generation Tau Bate, a resident mentor for USC Housing, and active in his school's Symphonic Orchestra and Gospel Choir. His research interests are related to fuel cell and battery technology. After graduation, he hopes to gain experience in the field of chemical engineering.

Minnie Lahoti, *Record No. 838*

Minnie is an international student majoring in chemical and biological engineering at the University of Alabama. She is involved in research in synthesis of organic solar cell dyes and heterogeneous catalysis, along with being AIChE chapter president. She plans to apply to graduate schools in the fall.

Jill E. Langlas, *Stabile No. 221*

Jill is a mechanical engineering major at The University of Kansas. She is part of the SELF Engineering Leadership Fellows program and is going to India to learn about engineering there and the global market. She is team leader of the Formula SAE team at KU, Jayhawk Motorsports. In time, Jill plans on going back to school to pursue an MBA.

Bradford J. Lapsansky, *Record No. 839*

Brad is pursuing a B.S. in engineering science with a minor in engineering mechanics at Penn State University. He is involved in research that will culminate in a computer model of the chemo-mechanical processes of brain tissue. After graduation, he hopes to have a career in research, in either the private or public sector.

Alexa J. LaQua, *Scribner No. 24*

Alexa is a junior majoring in geological engineering at the University of North Dakota. She is working as a NSF REU intern at the Univ. of Minn. -Twin Cities. Alexa was elected e-council representative for UND's SWE chapter and enjoys volunteering in the community. Her dream is to pursue a career studying volcanic behavior to one day tap them for geothermal energy.

Jin W. Lee, *Soderberg No. 20*

Jin is majoring in mechanical engineering at Binghamton University and is TBP chapter vice president. He is doing research on the application of nanoparticles to prevent infection caused by bacteria. After a year of research, he became drawn to the potential of nanotechnology to revolutionize people's lives. Jin plans to earn his Ph.D. and for a career in academia.

Sangmin Lee, *Record No. 840*

Sangmin is majoring in chemical engineering at The University of Michigan. He is involved in biophysics research and has interned with Merck & Co., Inc., in the vaccine commercialization division. He plans to go to medical school and hopes to apply analytical and problem solving skills he obtained from engineering education in the field of medicine.

Stephen J. Lee, *Alford No. 8*

Stephen is majoring in biomedical engineering at Tulane University, where he is TBP chapter president. Currently, he is researching in a stem cell and regenerative medicine lab, where he intends to have first authorship on a scientific manuscript. He plans to pursue a master's and will seek a career in the medical device industry.

Yoon H. Lee, *Record No. 841*

Yoon is studying biomedical engineering at Northwestern University, where she ranked first in her group. She is a member of the neuroscience and robotics lab, working with whisker sensors, and Engineering World Health, helping design a negatoscope for third-world clinics. Yoon plans to go to medical school and do research in medical mechatronics.

Jacob R. Leins, *Record No. 842*

Jake is a civil engineering major at Colorado State University. At CSU, he is the membership chair of ASCE, a ram handler (caretaker of CSU's animal mascot), a member of Chi Epsilon, and a FOCUS student missionary. He is interested in water resources and hydraulic engineering and seeks employment upon graduation.

Andrew M. Liebendorfer, *Record No. 843*

Andrew is majoring in chemical engineering at Case Western Reserve University. He is a co-op at Vancive Medical Technology and is working on a wearable sensor that adheres to the skin. He plans on co-oping again in spring of 2015 at an energy company, and upon graduation he will pursue a position in either pharmaceuticals or battery technology.

Shuwen Lin, *Record No. 844*

Shuwen is majoring in chemical and biomolecular engineering at Tulane University, where she is at the top of her class. She is president of SWE at Tulane and has been conducting stem cell research since her sophomore year. Shuwen is applying to medical schools and plans to integrate engineering knowledge into her medical career.

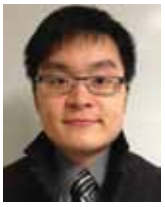
Connor J. Lind, *Forge No. 15*

Connor is a mechanical engineering major at the University of San Diego and ranks first in his class. Connor has built bridges in Haiti and taught English to Buddhist nuns in the Indian Himalayas. He is a USD Social Innovation Challenge winner and the founder of USD Engineers Without Borders. He plans to pursue a graduate degree in development studies.

Qinye Liu, *Record No. 845*

Qinye is a mechanical engineering major at Pennsylvania State University. She is involved in lightweight robot research and lubrication theory research. She hopes to contribute to improve the performance of vehicle systems to benefit the world. She plans to pursue a master's in mechanical engineering and then look for a position in industry.

Wuli Liu, *Record No. 846*



Wuli is an electrical engineering major at Clarkson University with a statistics minor and enjoys data analysis. He is the co-founder and vice president of the SASE chapter at Clarkson. He has been involved with research in the field of biomedical engineering. He has had internships with GE and Procter&Gamble. He will pursue a master's degree.

Cody J. Lundie, *Mentor No. 10*

Cody is double majoring in computer & electrical engineering and first in his class at South Dakota School of Mines & Technology. He has an internship with Johns Hopkins University Applied Physics Lab working on NASA's Solar Probe Plus mission. After graduation, Cody is pursuing grad school with interests in autonomous systems and intends to work for NASA.

Joshua G. Mangelson, *Record No. 847*

Joshua is an electrical engineering student at Brigham Young University. He has worked as a research assistant with Dr. Nelson in the center for high-performance reconfigurable computing lab with an emphasis on FPGAs. His enjoyable experience as a teaching assistant has led him to pursue a Ph.D. in control theory and DSP.

Nathaniel R. Marchant, *Record No. 848*

Nate is a chemical engineering student at Brigham Young University. He served for two years as a missionary for the CJCLDS in Halifax, Canada. Following graduation, he will go to graduate school in business management. Nathaniel desires to work with technology-based start-ups either in an entrepreneurial role or through venture capital.

Walid Mefteh, *Forge No. 16*

Walid is a software engineering major with a math minor at San Jose State University. He is from Tunisia and came to the U.S. in 2010. He serves as secretary of Golden Key and as treasurer of the National Society of Leadership and Success. Walid has been appointed as a member of the President's Commission on Diversity. After graduation, he will look for a software engineering job.

Shivani S. Mehta, *Bose No. 7*

Shivani is a senior in electrical engineering at Georgia Tech. She has completed a four-semester co-op at the Institute of Nuclear Power Operations and has been interning at Siemens as a hardware engineer. After graduation, she would like to pursue a masters and then work as a hardware engineer to create future cutting-edge technology.

Jorge D. Mena, *Record No. 849*

Jorge is a biomedical engineering major at Georgia Tech. Jorge is involved in research, numerous volunteer initiatives, and leadership development programs. He is working in New York and plans to work in the biomedical industry for two years, and then go back to get an M.D./MBA. His goal is to be a physician and help provide more affordable medicine.

Vincent J. Micek, *Record No. 850*

Vince is studying civil engineering at Bradley University. He is involved in organizations such as ASCE, Chi Epsilon, and Sigma Alpha Epsilon. He has worked as an intern for the Illinois Dept. of Transportation, where he was involved in several road construction projects. He hopes to pursue a full-time career with IDOT in the near future.

Aaron J. Miller, *Record No. 851*

Aaron is a junior in the biomedical engineering program at the University of Utah. He is researching the genetics of C. Elegans, to understand the relationship between trans-membrane proteins and how these relate to the defecation cycle of the worm. He is applying for medical school.

Jacob D. Miller, *Stabile No. 222*

Jacob is majoring in mechanical engineering at Cedarville University. He loves to travel and spent the summer in Beijing, China. After graduating, he would like to continue his education in a way that combines engineering with healthcare. He is currently interested in either working with prosthetics or dentistry.

Amani U. Moin, *Record No. 852*

Amani is double majoring in chemical & biological engineering and economics at Colorado State University. She is a member of AIChE and co-captain of her university's Chem-E-Car team. Amani is also an undergraduate researcher and tutor. After graduation, she plans to pursue a career in pharmaceuticals or medical devices to make an impact on the quality of healthcare.

Jacob P. Monagle, *Record No. 853*

Jake is an electrical engineering major with a minor in mathematics at the University of Alaska Fairbanks. He is working in the Prudhoe Bay oil field as an intern for an electrical engineering firm. His interests include aviation, unmanned systems, and instrumentation. After graduation, he hopes to move to Seattle, WA, and work for The Boeing Corp.

Joshua D. Moon, *Record No. 854*

Josh is a chemical engineering major at the University of Alabama with a 4.0 G.P.A. He is doing undergraduate research on materials for clean energy technology and serves as a senior computer lab manager for the university honors program. He plans to pursue a Ph.D. and work in a corporate R&D department developing new materials.

Benjamin H. Morrell, *Record No. 855*

Ben is majoring in chemical engineering at Brigham Young University. He is an officer in TBP, loves learning and sports, is doing research, and is looking forward to an exciting future! He was a high school valedictorian and is among the top of his class. Ben also speaks Tagalog and spent two years in the Philippines on an LDS mission.

David P. Mysona, *Record No. 856*

David is a biomedical engineering major at University of South Carolina. He is a member of the men's rugby team and was named to the 1st-Team All-Southeastern Rugby Conference team in spring of 2013. David belongs to numerous campus organizations and is a freshman mentor. He plans to pursue an M.D./Ph.D.

Jay C.C. Nair, *Stabile No. 223*

Jay is double majoring in mechanical engineering and applied physics at the University of Idaho where he is ID A chapter President. He is an Eagle Scout and the philanthropy chairman of the U of I fraternity chapter of Phi Delta Theta. This summer he interned at Sandia National Laboratories. His future plans include attaining a master's degree.

Connor P. Nash, *Record No. 857*

Connor is majoring in chemical & biological engineering with a minor in biomedical sciences at Colorado State University. He is undecided about his postgraduate plans, but his current work in a developmental neurobiology lab will help with his career aspirations in bioengineering. Of particular interest are the fields of tissue engineering and regenerative medicine.

Ashley N. Ng, *Record No. 858*

Ashley is in the ACCEND program at the University of Cincinnati, obtaining her B.S. in chemical engineering and MBA simultaneously. She is finishing up her fifth term of co-op at Ashland, completing rotations in process technology, maintenance, and process controls. After graduation, she plans to work in industry as a process engineer.

Kara L. Ninke, *Schwaller No. 3*

Kara is a mechanical engineering major at Colorado School of Mines. She is active in many organizations, including Sigma Kappa Sorority, SWE, ASME, and Up til' Dawn, which supports St. Jude Children's Research Hospital. Kara is interning with Phillips 66 at the Billings Refinery and plans to utilize her degree to progress the development of renewable energy technologies.

Adesuwa Nosakhare, *Dodson No. 54*

Adesuwa is pursuing a B.S. in chemical engineering at the University of Maryland Baltimore County. She has participated in summer research programs at MIT and is a math tutor at UMBC. After graduating, she plans to intern with ExxonMobil in a foreign country and then attend a graduate school to obtain a master's degree in petroleum engineering.

Thomas J. Notchick, *Record No. 859*

Thomas is an electrical engineering major at Western New England University, with a major G.P.A. of 3.98. He is actively involved in the campus community as president of the senior class council, a peer advisor for first year students, and more leadership positions. He hopes to work in the aerospace industry.

Max L. Olender, *Stabile No. 224*

Max is studying mechanical and electrical engineering at the University of Michigan, where he maintains a 4.0 G.P.A. He is a project leader for his chapter's Cub Scouts Day, VP of the Jewish Engineering Association, and active across campus. Max spent the summer interning at Los Alamos National Laboratory and plans to pursue a BME graduate degree.

Ahmad H. Omar, *Record No. 860*

Ahmad is majoring in civil engineering at the University of South Alabama. After graduation, he plans to pursue a master's degree in structural engineering. He is conducting summer research studying pervious concrete. Ahmad is active in ASCE and is an officer in SAME student chapter. He attends school full-time and works part-time for an engineering firm.

Kevin T. Orbine, *Stabile No. 225*

Kevin is a mechanical and aerospace engineering major at Rutgers University, where he teaches first year physics, serves as president of his honors society, and works as a research assistant. After graduating, he hopes to take his internship experience in manufacturing to a design-related job within industry and later pursue joint graduate degrees.

José L. Ortiz, *Stabile No. 226*

José is majoring in industrial engineering at Worcester Polytechnic Institute. He is an international student from Ecuador with a 4.0 G.P.A. He completed his junior project in Australia and will do his senior capstone project on manufacturing process improvement with a pharmaceutical company. He plans to gain professional experience and then an MBA or master's degree.

Edward J. Overy Jr., *Record No. 861*

Eddie is majoring in chemical engineering at Brigham Young University. After receiving his bachelor's degree, he plans to work in the chemical industry as a process/contact engineer. His long term goals include earning an MBA and moving into management roles in industry where he can plan and oversee large plant projects.

Tawni M. Paradise, *Forge No. 17*

Tawni is majoring in industrial and systems engineering and computer science with a 3.96 G.P.A. at the University of San Diego. This summer she has been active in ergonomic and sustainability research, while volunteering with animals and children. She plans to become a teacher and positively impact her student's lives.

Melanie R. Payne, *Record No. 862*

Melanie is majoring in civil engineering at Clemson University. She was TBP chapter vice president and is an active member in Zeta Tau Alpha, Chi Epsilon, and Students Helping Honduras. Last summer, she worked as an environmental intern for Santee Cooper. After graduation, she plans to find a job and then pursue a master's degree in environmental engineering.

Hector D. Perez Parra, *GEICO No. 36*

Hector is from Colombia and is a chemical engineering major at Brigham Young University. He currently does research in the BYU catalysis lab on catalyst characterization and reactor modeling. Hector plans on pursuing a Ph.D. in grad school and to return to Colombia to contribute to its developing economy.

Kevin A. Perkins, *Record No. 863*

Kevin is an electrical engineering major at Brigham Young University and ranks first in his class. He is a teacher's assistant and researches in MRI physics. He served a mission in California and became fluent in Spanish. Kevin enjoys singing and spending time outdoors. He plans to pursue a Ph.D. for a career in researching and developing advanced technology.

Ethan R. Perry, *Stabile No. 227*

After paying for school at Montana State University by shoeing horses with his family business, Ethan would like to combine this experience with his mechanical engineering background. He also has an interest in renewable energy and plans to pursue its use in Montana. Ethan has worked with BP at Cherry Point Refinery in Bellingham, WA.

Kristen L. Perry, *Record No. 864*

Kristen is studying civil engineering at Oklahoma State University with specific interests in structural and transportation engineering. She is a member of Chi Epsilon, ASCE, and involved with Engineers Without Borders. After graduation, her desire is to travel overseas and use her education to benefit underdeveloped countries.

Sarah A. Perry, *Stabile No. 228*

Sarah is majoring in industrial and systems engineering at Auburn University and is tied for first in her class with a 4.0 G.P.A. She is active as president of the AU chapter of ΑΠΜ, treasurer of the university honors congress, and as an undergraduate researcher. Sarah has been interning with ExxonMobil.

Thomas A. Peterson, *Stabile No. 229*

Tom is a mechanical engineering major at the University of Minnesota-Twin Cities and is active with Engineers Without Borders and the Navigators ministry on campus. He works at 3M as a tech-aide where he designs and prototypes small electro-mechanical devices. After graduation, he hopes to enter into industry or start his own small business.

Jeffrey W. Pettyjohn, *Record No. 865*

Jeff is an electrical engineer at Georgia Tech with a 4.0 G.P.A. and ranks first in his class. He is in the Steven A. Denning Tech. & Mgmt. Program that focuses on cross-functional leadership in developing technological and business-related solutions. He will pursue a graduate degree prior to entering industry, capitalizing on his experiences, including a co-op with Southwire Corp.

Cody R. Phelps, *Forge No. 18*

Cody is a civil engineering major at the University of California, Davis, where he received the Risken Environmental Engineering Award. Internship opportunities have included positions at a waste-to-energy power plant and air quality agency. He aims to pursue a graduate degree in environmental engineering.

Wiphawi S. Phifer, *Record No. 866*

Mo is a civil engineering major at South Dakota State University and is involved in ASCE, Chi Epsilon, and Engineers Without Borders. She plans to attain her EIT this year and eventually a P.E. Mo is a water/wastewater intern at HDR, Inc. After graduation, she hopes to gain experience through work abroad, participate in research, and attend graduate school.

Vinh T. Phung, *Record No. 867*

Vinh is majoring in electrical engineering and minoring in mathematics and computer science at the University of Houston. He is an international student from Vietnam. This summer, Vinh is interning at National Oilwell Varco and hopes for a full-time job in the oil and gas industry. His alternative plan is to pursue a Ph.D. in aerospace engineering.

Jessica M. Piper, *GEICO No. 37*

Jessica is a chemical engineering major at Arizona State University, a member of the honors college, and minoring in sustainability to increase her knowledge about human alteration of earth and how engineering can achieve a sustainable lifestyle. Jessica plans to gain professional experience in industry and pursue a graduate degree.

Christopher V. Poulton, *Record No. 868*

Chris is pursuing a B.S. in electrical and computer engineering with minors in computer science and applied mathematics at the University of Colorado at Boulder. He has published and presented research in silicon photonics and interned at National Instruments. He hopes to continue this work through a Ph.D.

Samuel M. Prentiss, *Stabile No. 230*

Samuel is majoring in mechanical engineering and minoring in mathematics at the University of Maine. He is employed as a summer intern with Southworth Products Corp. (Falmouth, ME), where he uses Solidworks to model large industrial hydraulic scissor lifts. He plans to attain his master's degree in a mechanical engineering field after taking time to ski, snowmobile, and enjoy nature.

Aaron Z. Priluck, *GEICO No. 38*

Aaron is majoring in chemical engineering at The University of Michigan, Ann Arbor. He enjoys volunteering at the Uof M hospital and working in a chemical engineering lab focused on drug delivery and imaging. Aaron is looking forward to helping organize a TBP book swap this fall. He plans to attend graduate school and apply chemical engineering principles to medicine.

Srinidhi J. Radhakrishnan, *Record No. 869*

Sri is majoring in chemical and biological engineering at the University of Colorado at Boulder. She writes articles for *The Colorado Engineer*, CU's engineering, science, technology publication. Sri's work, thus far, has been biologically focused. She is interning with ConocoPhillips to gain a better idea of the work she will do as a chemical engineer.

Karly D. Rager, *Campbell No. 28*

Karly is a civil engineering major at Colorado State University. She is the TBP chapter president and a member of ASCE. She is working as a structural engineering research intern on seismic risk reduction of soft-story wood-framed buildings for the Network of Earthquake Engineering Simulation. Her career goal is to work as a structural design engineer.

Juan D. Ramirez, *Stabile No. 231*

Juan is an ocean and electrical engineering major at Florida Atlantic University, where he is TBP chapter president. His interests include ocean renewable energy, AUV's, and embedded systems. He plans a thesis on renewable energy and to attend graduate school to research minimizing dependence on fossil fuels.

Hilary L. Ramseier, *Dodson No. 55*

Hilary majors in petroleum engineering at Montana Tech and is first in her class with a 4.0. She is active with the Society of Petroleum Engineers, Engineers Without Borders, Pi Epsilon Tau, and SWE. She is a mentor for Big Brothers Big Sisters. She has held internships with energy companies and plans to be hired on full-time as a petroleum engineer after graduation.

Jonathan P. Reardon, *Stabile No. 232*

Jonathan is majoring in mechanical engineering at the Virginia Military Institute with a minor in mathematics and a concentration in aerospace engineering. He participated in the LARSS program at NASA's Langley Research Center. Upon graduation, he hopes to go to graduate school in aerospace engineering and then get a job focusing on aerodynamics or propulsion.

Matthew F. Reardon, *Record No. 870*

Matthew is a civil engineering major at the Virginia Military Institute and president of the VMI Investment Club Large Cap stock group, which trades and manages over $200,000 of assets. Matthew is engaged in research involving tensile and bonding strength between concrete layers with roughened surfaces. He plans to pursue a career in structural engineering.

Victor M. Rosario-Melendez, *Stabile No. 233*

Víctor is a mechanical engineering major at the University of Puerto Rico at Mayagüez and ranks first in his class. He is an honor student and active in AIAA, AIChE, Pi Tau Sigma, and TBP. Víctor has internship experiences at Air Products and GE Energy Management. Víctor is currently focusing his career in the oil & gas field after an internship at BP.

Hannah K. Ross, *Stabile No. 234*

Hannah is a mechanical engineering major at Tennessee Tech University. She is TBP chapter president, a member of her university's honors program, and an on-campus math tutor. She has just completed a semester abroad in France and is interested in pursuing a master's. Her research interests include renewable energy and transportation.

Jason A. Ross, *GEICO No. 39*

Jason is pursuing a dual degree in biomedical engineering and music performance at the University at Buffalo. He spent two summers interning at Roswell Park Cancer Inst. working on novel drugs in breast cancer research with plans to obtain an MD/Ph.D. in medical research. Jason is active outside of the classroom as a local clogging group leader and composes works for his own percussion recitals.

Ryan L. Rossiter, *Record No. 871*

Ryan is majoring in computer science and mathematics at South Dakota State University, where he is first in his class with a 4.0 G.P.A. He has enjoyed summer internships with Daktronics and IBM. After graduation, he hopes to pursue a master's degree in computer engineering, with an emphasis on embedded systems.

Noah T. Sandoval, *Record No. 872*

Noah is pursuing a degree in engineering education at Colorado State University, with a second major in Spanish. He plans to use his degrees for a semester of student teaching at La Universidad Autonoma de Yucatan, where Noah will be teaching engineering, English, and leadership in both languages.

Justine E. Schaper, *Stabile No. 235*

Justine is majoring in mechanical engineering and minoring in aerospace engineering and psychology at The University of Missouri-Columbia. She is vice president of her TBP chapter and president of Alpha Omega Epsilon, a social and professional engineering sorority. Upon graduation, she hopes to further her education in graduate school after gaining experience working in industry.

Eric S. Schlabs, *Record No. 873*

Eric is a civil & environmental engineering major at George Washington University. He holds a wastewater treatment research internship and is involved with numerous activist organizations. Upon graduating, Eric plans to attend law school; he hopes that dual degrees in engineering and law allow him to effectively promote sustainable global development and environmental stewardship.

Daniel E. Schwab, *Record No. 874*

Dan is majoring in construction engineering at Iowa State University. He is interning with a design-build company helping oversee the construction of Gavilon's world headquarters. Plans for this coming year include studying for the FE exam, graduating, and working for the company where he is interning.

Jordan M. Senff, *Stabile No. 236*

Jordan is majoring in mechanical engineering at the University of North Dakota. He has an internship at a local business–Machine Design & Engineering. He also participates in university outreach to get K-12 students interested in engineering. Jordan enjoys boxing and swimming, and his aspirations include serving in the U.S. Navy and pursuing a career in design.

Caroline E. Seng, *Record No. 875*

Caroline is double majoring in biomedical engineering and electrical & computer engineering at Duke University. She co-founded an engineering volunteer organization and researches with a developing world health lab. She spent summers repairing medical equipment in a Nicaraguan hospital and interning at GE. Her plans include the healthcare industry and a master's degree.

Neel P. Shah, *Record No. 876*

Neel is majoring in computer engineering at Northeastern University. As a research assistant, he helped develop state-of-the-art computer vision algorithms, using them to build innovative face-recognition and object-detection applications for security, national defense, and immigration purposes. Neel is also a peer mentor.

Nathan M. Shay, *Record No. 877*

Nathan is majoring in civil engineering with a minor in political science at Ohio Northern University. He is president of the joint engineering council, treasurer of ASCE, and project manager of the concrete canoe team. Nathan conducted research in traffic information systems at the NEXTRANS center. He aims for a career in transportation planning.

Scott R. Sheahan, *Stabile No. 237*

Scott attends Brigham Young University where he will graduate with a B.S. in mechanical engineering. He is fascinated with aerospace engineering and plans on going to graduate school to study aerospace engineering. After graduating from BYU, he plans on working for Boeing and then returning to school to get an MBA.

David L. Smith, *Stabile No. 238*

David is majoring in mechanical engineering and mathematics at the University of Kentucky. He plans to pursue a master's degree and work as an engineer at a manufacturing facility. His recent internship focused on R&D, which helped him gain experience in the engineering field. He would ultimately like to be in management where he can apply his engineering background.

Michelle J. Song, *Record No. 878*

Michelle is a polymer engineering major at Case Western Reserve University. She hopes to pursue a master's degree in her field and later work in the electronics industry. She is particularly interested in display and battery fields. This summer, she interned at the Univ. of Seoul to study OLEDs.

Cassandra K. Stallbaumer, *Fife No. 21*

Cassandra is majoring in architectural engineering at Kansas State University. She is involved there as an officer of TBP, Architectural Engineering Inst., and Structural Engineers Assoc. of KS & MO. This summer, she gained professional experience as an intern at BSE Structural Engineers. She plans to pursue a master's in structural engineering before entering industry.

Kristin M. Stewart, *Fife No. 22*

Kristin is majoring in architectural engineering at Kansas State University, where she is TBP chapter president. She is also a member of Phi Alpha Epsilon and Steel Ring. She has interned for Ross & Baruzzini in St. Louis for two summers and hopes to continue work there upon graduation. Kristin plans to obtain her P.E. license after gaining experience in the field.

Janelle Strampe, *GEICO No. 40*

Janelle is majoring in chemical engineering at the South Dakota School of Mines and Technology. She is a varsity member of the Div. II volleyball and basketball teams and had the opportunity to travel abroad for engineering programs in Chile and Germany. Her plans include obtaining a biomedical master's degree and exploring going into the medical industry or medical school.

Bryan J. Stringham, *Stabile No. 239*

Bryan is studying mechanical engineering at Utah State University and has a 4.0 G.P.A. while staying involved in extracurricular activities and recently working as an undergraduate researcher. He hopes to pursue a Ph.D. related to either renewable or nuclear energy. He will focus his career on fulfilling his dream of owning an energy-related engineering firm.

Phoebe Sulzen, *Forge No. 19*

Phoebe is a mechanical engineering major at California State University, Los Angeles. She has participated in NASA's Reduced Gravity Education Flight Program and the University Student Launch Initiative. An active board member of TBP, she interned for two summers at the Jet Propulsion Lab and hopes to work there full-time while attaining her master's.

Steven R. Sundberg, *Stabile No. 240*

Steven is majoring in mechanical engineering at the University of Wyoming. While attending school, he works full-time for the UW college football team. Steven is undecided on whether to enter the workforce or go to graduate school. He has developed a curiosity in several different fields and looks forward to the future.

Ki-Joo Sung, *GEICO No. 41*

Ki-Joo is majoring in chemical engineering with a minor in biochemistry at The University of Michigan, Ann Arbor. She hopes to pursue a doctorate in chemical engineering with an emphasis on tissue engineering. This summer she interned at the Institute for Regenerative Medicine, working on developing functional tissue from stem cells.

Peter Sutor Jr., *Record No. 879*

Peter is a computer science and systems analysis mathematics major at Pennsylvania State University, where he ranks first in his group. He plans to pursue a master's degree and ultimately a Ph.D., afterwards finding a job as a software engineer or designer. This summer, he is interning and working on his thesis – faster integer multiplication algorithms.

Divyagash Swargaloganathan,*Record 880*

Divyagash is a biomedical engineering major at Rutgers University with a 4.0 G.P.A. and first in his class. He is TBP chapter secretary, treasurer of AEMB of Rutgers, and a physics tutor. Divyagash also does research in biostatistics, global health, and microfluidics. He plans graduate school and then a career in epidemiology and biostatistics.

Brian P. Tallman, *Stabile No. 241*

Brian is majoring in mechanical engineering with a math minor at the University of Minnesota, Duluth. He is an Eagle Scout and involved in multiple clubs both in his major and in outdoor clubs. He is interning as a maintenance engineer at Amsoil Inc. in Superior, WI. After graduating, Brian plans on staying in the fast-paced manufacturing engineering field.

Patrick T. Tate, *GEICO No. 42*

Patrick is studying chemical engineering, biological engineering, and Hispanic studies at Montana State University. He has completed internships in process engineering and logistics with BP and ExxonMobil. Patrick plans to pursue an MBA and hopes to find a career embracing his passions for problem solving and languages.

Lily M. Thomas, *Stabile No. 242*

Lily is an industrial engineering major at the University of Massachusetts at Amherst. She is currently completing a senior honors thesis in supply chain management. Lily is a member of SWE and IIE and has interned with GE Oil & Gas in the materials planning department. She hopes to enter into a leadership development program after graduation.

R. Lucas Thomas, *Record No. 881*

Lucas is majoring in chemical engineering at the University of Alabama. He has done physiology research on polycystic ovary syndrome and other endocrine diseases and is pursuing a career in medicine. An avid traveler, he spent this summer teaching English in Romania and studying in Denmark.

Sarah E. Thomson, *Stabile No. 243*

Sarah is a mechanical engineering major at Worcester Polytechnic Institute with a concentration in mechanical design. She is a member of Pi Tau Sigma, SWE, and Admissions Ambassadors. After graduation, Sarah plans to pursue a career in product design, so she can enhance the lives of future generations.

Tam T. Tran, *Mitchell No. 4*

Tam is majoring in petroleum engineering with a minor in mechanical engineering at Texas Tech University. He is an active member of the Society of Petroleum Engineers and outgoing TBP chapter officer. Tam is an intern in a drilling and supply company and hopes to have a career in the oil and gas industry. Then he might pursue a master's degree.

Brandon J. Tripp, *Record No. 882*

Brandon is pursuing a bachelor's degree in civil engineering at the University of Alabama at Birmingham. He is active on campus as TBP president, NSBE president, and in multiple community service activities. Brandon is interning with Chevron as a facilities engineer. After graduation, he plans to obtain a graduate degree in petroleum engineering and continue his professional career.

Chi H.K. Truong, *Record No. 883*

Chi is majoring in chemical engineering at the University of Maine. She has been involved on campus with SWE, Phi Kappa Phi, Intl. Student Assoc., and as a resident assistant. Chi has worked on paper science related research projects for two years. She has completed two co-op terms at Lincoln Paper and Tissue and plans to pursue more education and a career as a chemical engineer.

Kyle S. Tyson, *Stabile No. 244*

Kyle is majoring in naval architecture and marine engineering at the University of New Orleans. He is a member of Golden Key, Omicron Delta Kappa, and president of the Society of Naval Architects and Marine Engineers. He is an intern for Bollinger Shipyards and his future plans are to work in the New Orleans area as a project manager for new construction.

Allen L. VanMeter, *Record No. 884*

Allen is a biomedical engineering major at Case Western Reserve University. He serves as the corresponding secretary for his frat, as the VP for membership development of the Interfraternity Congress, and as the director of operations on CWRU's Dance Marathon committee. He is interning with Procter & Gamble and is involved in viral drug delivery research. His career goal is to practice medicine.

Tyler A. Voegele, *Stabile No. 245*

Tyler is a mechanical engineering major at the University of North Dakota. She is involved with Volunteer Engineering Students organization that does outreach in the local community and provides prospective student tours. Tyler is an undergraduate researcher on gas turbine engines. After graduation, she plan to pursue a master's degree and work on a design team.

Justen K. Vrabel, *Hart No. 1*

Justen is a rising senior studying mechanical engineering at Youngstown State University. He is actively involved on campus, serving as the vice president of YSU's student government last year. He plans to obtain a graduate degree related to aeronautical or mechanical engineering.

Said Mansoor Wahab, *Forge No. 20*

Mansoor is majoring in electrical engineering at University of California, Davis. He plans to enter graduate school with the ultimate goal of becoming a professor. His research interests are in signal processing for communication systems. Mansoor has been participating in theoretical research utilizing different methods in digital signal processing.

R. Ryan Waked, *Record No. 885*

Ryan is a chemical engineering major at the University of Dayton and is also working on his master's in materials engineering. Additionally, he plans to pursue a Ph.D. He believes that future technologies cannot develop without the assistance of innovative materials. His interests lie in the fields of polymers and nano-materials.

Ryan T. Whelchel, *Fife No. 23*

Ryan is majoring in architectural engineering with an emphasis on structures at Kansas State University. He is involved in research and as an ambassador to the engineering college. He plans to pursue a master's degree in structural engineering and applied mechanics. Professionally, he seeks the challenge of designing structures that push the limits of engineering.

Luke Wilson, *Stabile No. 246*

Luke studies mechanical engineering at South Dakota School of Mines and Technology and is top of his class with a 4.0 G.P.A. He co-founded a swing dancing club and helped build the community of the year as a resident assistant. He works with composites for the SAE Mini Baja team. Upon graduation, Luke hopes to get a job in either automotive or heavy equipment industries.

Elissa K. Wolf, *Record No. 886*

Elissa is a double major at the University of Pennsylvania, studying digital media design and cognitive science. She has leadership positions in TBP and Advancing Women in Engineering. She is also president of UPenn's Reach-A-Peer helpline for crisis support. After working at Google and ToyTalk, she hopes to continue pursuing interdisciplinary work that is logical and creative.

Stephen J. Wood, *Record No. 887*

Stephen is majoring in electrical engineering at Brigham Young University. He is working as an undergraduate research assistant with an emphasis on bio-medical engineering and material sciences. He has several different research interests within electrical engineering and plans to pursue a Ph.D. after completing his degree.

Rebecca Wozniak, *Record No. 888*

Rebecca is majoring in biomedical engineering at Rensselaer Polytechnic Institute. She is a researcher focusing on biomaterials for regenerative medicine, and a learning assistant for freshmen. She is interning in the orthopedic biomechanics lab at the Cleveland Clinic. Her future plans include a master's degree and work as an R&D engineer in the biomedical field.

Wells Yang, *Record No. 889*

Wells is a biomedical engineering major at the Georgia Institute of Technology. He is active on campus with GT MOVE, a community service/tutoring organization, and at *The Pioneer*, the biomed student newsletter. Wells has been co-oping at Amendia, Inc., an orthopaedic implant company, and currently works as a research assistant and as a TA.

David L. Yoder, *Stabile No. 247*

David is a mechanical engineering student at Cedarville University, where he is a three-year member of the supermileage team and the university brass choir, in which he is the first chair trombone. He plans to pursue a career in automotive engineering, and has interned twice with Honda. David also hopes to obtain at least a master's degree.

Jennifer S. Youngpeter, *Record No. 890*

Jennifer is a chemical engineering major at the University of South Alabama. She will be researching the effects of the addition of metal ions on the synthesis of silica aerogels. Jennifer will use this research to write a thesis. After graduation, she would like to continue her education in either graduate school or medical school.

Chih-Chieh Yu, *Record No. 891*

Jay Yu is interested in how engineering can be used to explore animal brains. At University of Pennsylvania, he is majoring in bioengineering and researching neuroscience imaging systems to study the sleep mechanism in animals. One of his dreams is to develop a non-invasive interface connecting human brains to computers.

Xing J. Zhong, *Record No. 892*

Xing Jie is studying electrical and computer engineering with a minor in computer science and applied math at the University of Colorado at Boulder. After graduation, he plans to head straight into a Ph.D. program in robotics and controls. He is the president of his HKN chapter and also two year TBP chapter secretary.

ALUMNI GIVING TOPS $1,000,000!

Generous Tau Bates Gave $1,030,754 in the annual giving program during the year that ended July 31, 2013. This shatters the 2010-11 record of $938,409 by $92,000! The average gift from 10,996 donors was $93.74, also a new record. Total giving rose by 17 percent in this year of very generous alumni. In 2011-12, 11,082 donors gave $881,896 for an $80.12 average gift.

Included in these figures is $38,633 allocated to the Fellowship and Scholarship Programs from the 234 companies and foundations that match gifts made by their employees to ΤΒΠ.

Tau Beta Pi received a gift of $20,000 from Energy XXI to endow the Texas Delta Chapter voting delegate's attendance at the annual Convention. This is the first gift of its type which Tau Beta Pi hopes will facilitate shifting the cost of attending Convention away from new student members. We hope to identify a generous alumnus from each chapter who help support this initiative!

Generous bequests were received from the estates of **Charles O. Forge,** *CA Γ '56,* for $35,000; Kathleen A. & **Robert D. Sickafoose,** *IL B '50,* for $714; **Charles N. Wilson,** *WA A '70,* for $1,000; and **Frederick H. Ray,** *OH E '49,* for $10,000. The gift from Mr. Ray was in made in memory of Professor Ernie Harris, formerly of Fenn College of Engineering at Cleveland State University in Ohio.

Contributions from alumni are used for Fellowships, Scholarships, and the Engineering Futures, K-12 MindSET, and Laureate Programs, training chapter advisors at the Convention, visits by ΤΒΠ officers to chapters, and for supporting ΤΒΠ. The giving program began in 1963-64 when $7,860 was contributed. Cumulative gifts since 1963 have reached $23 million.

Tau Beta Pi received its first bequest in 1963 from **Henry B. Evans,** *PA A 1893,* who was ΤΒΠ's first President in 1895-96. The cumulative value of bequests and capital gifts is now $12,587,000. These gifts have been used to establish the following named scholarship and fellowship funds: M. Anderson Fellowship, D.L. Arm Fellowship, Best Fellowship, Deuchler Fellowship, C.R. Dodson Fellowship/Scholarship, C.O. Forge Fellowship, E.P. Hanley Fellowship, Stark Fellowship, M.U. Zimmerman Jr. Fellowship, Alabama Power Scholarship, H.M. Alford Scholarship, E.E. Althouse Scholarship, R.A. Curtis Scholarship, C.O. Forge Scholarship, L.E. Record Scholarship, R.D. Sickafoose Scholarship, A.C. Scribner Scholarship, V.A. Stabile Scholarship. Together with funds invested to support other ΤΒΠ programs, they generated $614,000 in earnings used for activities of the collegiate chapters.

During the year, ΤΒΠ received $117,000 from an irrevocable trust restricted to Fellowships or Scholarships—left to ΤΒΠ by the late **William Fife,** *CA A '21.*

2013 Alumni Giving Program May through July Contributors

The names of an additional 2,651 Tau Beta Pi alumni who made donations to the Association in the 2013 Alumni Giving Program appear in two separate sections on the following pages. Their gifts totaling $401,140 arrived between May 1 and July 31, 2013. **Gifts received after July 31st do not appear here but will be published in the Winter 2014 Bent.**

The generous assistance of each member is deeply appreciated by the Executive Council and other Association Officials. The financial resources have permitted strengthening our programs in several areas that emphasize the importance of Tau Beta Pi's basic objectives and that help all collegiate chapters and student members.

Donors' names are listed alphabetically within their chapters. Names of members who have qualified for the Tau Beta Pi Donor Recognition Clubs are listed only in the first section below. Names marked with a † symbol are of deceased members in whose memory donations were made either by relatives and friends or through bequests. In addition to the gifts acknowledged here, several were made anonymously through the Combined Federal Campaign, Network for Good, or JustGive and are also deeply appreciated. Matching entities are listed on page 46.

Donor Recognition Clubs

The names of 1,737 Tau Bates appear in this first section. They made donations to the 2013 Alumni Giving Program between May 1 and July 31, 2013, AND they have also made CUMULATIVE contributions (in some cases including matching gifts) and bequests to Tau Beta Pi through the years totaling from $250 to more than $1,000,000.

The Donor Recognition Clubs are part of our effort to recognize a donor's total lifetime cumulative giving to Tau Beta Pi. Such continuous support significantly contributes to the overall strength of the Association and allows our Society, with confidence in our financial resources, to plan for modest growth in our services to the engineering profession. These clubs were chartered by the Executive Council in 1986 and have been set at the following levels:

Matthews Club	*500,000*	*Alpha Club*	*25,000*	*Chi Club*	*1,000*
Nagel Club	*250,000*	*Beta Club*	*10,000*	*Second Century Club*	*500*
Williams Club	*100,000*	*Delta Club*	*5,000*	*Founder's Club*	*250*
Heikes Club	*50,000*	*Zeta Club*	*2,500*		

NAGEL CLUB
IN A Bechtel Jr., P.E., Stephen D. '46

WILLIAMS CLUB
IA A Campbell, P.E., Cleveland L. '47
VA B Anonymous '49

ALPHA CLUB
IN Δ Koller, David C. '62

BETA CLUB
CA Γ Davies III, Paul L. '83
CA Δ Anderson, Vincent C. '83
Mleczko, Eugene Leon '47
LA Γ Kitchens, Philip H. '67
MI B Brule Sr., David J. '72
NY B Frantz, William T. '80
NY Δ Wright, Peter A. '75
NY Θ Cohen, Bernard '54
OH B Barthel, Gerald R. '67
PA Δ Goldstein, Steven S. '65
TX Γ Loewenstern Jr., Walter '59
TX Δ Schiller Jr., John Daniel '81
UT A Ramo, Simon '33
WV A Baker, David W. '76

DELTA CLUB
AL A Brackney, William M. '58
CA A Masatani, Peter James '04
CA B Marshall III, J. Howard '57
CA Γ Johnson, F. Martin '58
Kennedy, Robert P. '61
CA Δ Davis, John Leo '60
CA E Chow, Chi-Hui Robert '85
Chow, Hilda C. '85
CA Θ McClay, Michael D. '73
CA Λ Crews, W. Brian '70
CA N Joy Jr., Robert Lee '66
CA Ξ Hickey, Robert W. '88
CT B O'Brien, Donald J. '51
FL A Holcomb, Rebecca Ann '04
IL B Clewett, Thomas Alan '88
IL Γ Crown, Lester '46
Johnson, R. Douglas '62
Rasmussen, Warren W. '53
IL Z Allendorfer, Robert Kevin '83
IN A Davidson, Charles D. '72
IA A Burmeister, Jon B. '68
LA A Olivier, Donald Andrew '51
LA Γ Rivers, John V. '63
MA H Sin, Chi-Kai '88
MS A Sinclair, William F H '63
MO B McHenry, Steven Dale '81
NJ B Gibson, Thomas K. '45
NY A Mendenhall, William W. '48
OH B Eggleston Jr., Robert F. '74
OH Γ Kolbas, John M. '47
OK A Pipkin, Omer A. '50
TX A Mickelson, P.E., Kent B. '77
TX Γ Wilson, Richard O. '56
TX Δ Fox, Craig Alan '77
Plank, Michael J. '83
Richardson, John E. '71
TX E Sitton, Randal W. '85
WA A Swanson, P.E., Hilmer S. '76

ZETA CLUB
AL A Bowers, Charles J. '69
Rowell, William J. '69
Wilhelm, William J. '58
AK A Gaddis, P.E., B. L. '73
AR A Newtown Jr., Glenford A. '69
CA A Crooks, Lawrence E. '71
CA B Drowley, Clifford I. '75
CA Γ Bowerman, Lawrence J. '69
Fowle, Mark C. '76
Kwok, Munson A. '62
Tyson Jr., USN Ret., James J.'58
CA E Friedmann, Norman E. '50
Warner Jr., John H. '63
CA K Ratcliffe, Alfonso F. '51
CA T Fable, Scott Edward '96
CO A Musser, Jack William '72
CO Δ Landseidel, Mark E. '82
CT B Killingbeck, David R. '77
DC Γ Cooper, Reid F. '77
FL A Shacter, Philip '79
FL B Messulam, Aldo J. '67
GA A Farr, Emory W. '54
Fawcett, Clinton Douglas '92
IL A Baits, Paul Gordon '79
Beernink, Kurt P. '82
Kehlet, Alan B. '51
Luzbetak, Paul Daniel '96
McGinnis, Gerald E. '58
IN A Felten, Loren Darrel '57
Mason Jr., Lowell B. '48
Palas, Richard F. '65
Royce, Richard S. '81
Teague, Stephen M. '71
Watkins, Eugene A. '52
IA A Carlson, Mary Terese '78
Feisel, Ph.D., P.E., Lyle D. '61
Harms, Richard P. '65
Krambeck, Scott David '82
KS A Meyer, Leslie D. '65
Reid, Jack P. '57
KS B Mueller, Robert L. '67
KY A Gould, William H. '61
KY B Lambert, Linda M. '88
Lambert, Michael Todd '88
LA B Vaughan, Robin M. '81
LA Γ Mohr, James D. '55
Samuels, Anne Kathreen '86
ME A Gordon, Richard O. '36
Jefts, Alan R. '73
MD B Ausherman, Donald W. '79
Sabio, Vincent Joseph '86
MA B Dettmer, Robert G. '55
Poduska Sr., John W. '59
ME A Mahoney, John J. '56
MA Z Poulin, James E. '66
Walker Jr., William E. '57
MI A Colbry, Dirk Joel '06
Colbry, Ph.D., Kathleen L. '99
MI Γ Clare, Carl P. '27
Liepa, Mark A. '81
Seidel, David A. '81
MI Δ Dietrich, Robert W. '57
Wall, Raymond J. '50
MI Z Dymale, Raymond C. '70
Pettiford, Steven D. '72
MS A Shackouls, Bobby S. '72
MO A Kay, Billy G. '62
MT A Rosness, George E. '43
MT B Samuels, Blake Robert '84
NE A Walcott, Gwen S. '82
NV A Lovekin, James W. '80
NJ A Gorog, Russell M. '70
NJ Γ Friedman, Frank R. '63
NM B Modrall, David Righter '91
Slominski, Paul '78
NY A Elwell, William E. '78
NY Δ Abel, John F. '63
Altschuler, Stanley J. '63
Swanson, John A. '62
NY E Grosso, John J. '69
NY H Butterman, Heidi C. '79
NY Ξ Runowich, Carl J. '84
NC A Vercaemert, Carol S. '76
OH A Rasbold, James Charles '83
OH B Stergiopoulos, James Michael '61
OK B Bobo, James E. '77
PA A Weber Jr., John Herbert '63
PA B Marstiller, Charles E. '74
Sterner, George R. '62
PA H Hettche, Leroy Raymond '61
Thompson, Robert Alan '60
PA Θ Caramanico, Thomas A. '71
PA I Drill, Philip S. '51
RI A Jessup Jr., W. Edgar '44
RI B Dusablon, Louise V. '64
TX A Wells, Roger Murray '71
TX B Carey, Martha D. '80
Womack, Robert K. '75
TX Γ Dobbins, James R. '74
Jordan, Paul Joseph '90
TX E Repsher, Kenneth W. '76
VA B Friar, Billy W. '58
WA A Gunter, Robert A. '62
WA B Moors, Donald E. '55
Schmidt, V. Hugo '51
WI A Delucca, Gregory J. '59

CHI CLUB
AL A Baker, Scott T. '74
Glover, Martin C. '70
Goodwin, James J. '58
Reynolds, Edgar L. '70
AL B † Ellis Jr., Giles Milton '37
Johnson Jr., James H. '59
AL Γ Boam, Ashley B. '93
AK A Usibelli, Joseph E. '59
AZ A Kennedy Jr., Thomas W. '59
Mensch Jr., William D. '71
Snyder III, Robert J. '77
AZ B Barnett, J. Matthew '90
Jackson, Stephen R. '90
AR A Nixon, Dale B. '68
CA A Gottwald, Carl H. '48
Van Dyke, Korbin S. '80
CA B Waters, Alfred E. '48
CA Γ Hillier, Frederick S. '58
Roodhouse, James G. '59
Tirado, Leo A. '73
† Trinaystich, John A. '52
CA Δ Horton, William D. '53
Zaatari, Mohammed Omar '88
CA E Ackert, Sidney A. '61
Gaunt, Arnold J. '86
Perrine, Richard L. '49
CA Z Jacobberger, Donald H. '58
Lampe, Fred P. '79
Perrin, Michael E. '67
Tan, Jeremy J. '00
CA H Akers, Joe L. '69
Burrows, Stanford '63
Hasker, Harlan R. '63
Zanini, David Victor '90
CA K Scanlan, Lawrence A. '68
CA Λ Mueller, Cathryn Lynn '82
Sullivan, Dana K. '80
West, Timothy D. '78
CA N Chew, James S B '84
McCroskey, William T. '71
Shimokawa, Reyn Yukio '95
Vandegriff, Don G. '67
CA Ξ Henry, James J. '75
CA P Hoffmann, Kevin V. '80
CA Σ Stoller, Roger E. '78

CHI CLUB, CONTINUED

CA Y Idenmill, Ethan Matthew '04
CO B Farmer, Brian K. '78
† McDonnell, Sanford N. '48
Moser, Kirk E. '77
Tinnan, Mitchell T. '76
Winsand, Amos O. '52
CT B Cirella, Robert M. '85
Hudson Jr., Frederick J. '58
Leib, David B. '61
Pitkin, Edward T. '52
Pressman, Ph.D., Roger S. '69
Zajac, Gerald E. '68
CT Γ Judd, Kyle Peter '91
DE A Dell, Gregory A. '82
Folsom, Steven A. '77
DC A Engram, Robert L. '69
Wen, William '68
DC B King, David A. '68
Walsh, Bryan Patrick '97
DC Γ Ashie, Ibrahim A. '70
Keltie, Robert J. '69
FL A Bowles Jr., Carl H. '54
Burkart, Scott L. '78
Daniher, Peter M. '66
Doernbach, Jay D. '62
FL B Elnaggar, Suzanne '93
Sipes, Alesia J. '84
FL Γ Fleming, Gerald J. '82
Lancor, Barbara J. '79
FL E Smith, Larry M. '87
GA A Akridge, G. Russell '62
Cooper Jr., Basil P. '65
Mowrey, Daniel B. '65
Negro, James E. '68
ID A Marks Jr., John R. '77
Peters, Daniel J. '80
IL A Anderson, Raymond C. '50
Epstein, Sidney '43
Kitch, William A. '82
Nelson, Gordon K. '51
Nolte, Kenneth G. '64
Snyder, Dan W. '50
Vogel, Frederick M. '80
IL B Plesniak, Michael W. '83
Trytko Jr., John E. '56
Uherek, Frank C. '82
IL Z Wislek, Michael A. '89
IN A Beal, Dick H. '49
Chrisman, Donald W. '42
Graver, Richard B. '54
Hendryx, Kevin S. '81
Howard, Donivan R. '58
Ihlenfeld, Jay V. '74
Livingston, Julian R. '60
Maloney, Eugene D. '64
McDonald, John D. '73
Menke, Richard H. '56
Montgomery, Stephen T. '71
Rathbone, Donald E. '51
Rea, David R. '62
Renner, Arnold E. '54
Risa, Kristen '69
Roby, Dennis E. '60
Scharlach, Richard M. '49
Schlosser, Samuel C. '71
Weiss, Arthur Frank '55
Yackish, P.E., Thomas M. '60
IN B Berghoefer, Fred G. '43
Cary, Jeffrey M. '77
Hamilton, Charles E. '59
Martin, Jeffrey V. '78
Mills, Matthew D. '87
Noblitt, Niles L. '73
IN Γ Hutchins, Robert L. '62
Lucey, Josephine Ann '80
IN Δ Lorenz, Mark J. '80
Luecke, Edgar J. '55
Valenti, Paul M. '01
Vocke, Merlyn C. '55
IA A Berkholtz, P.E., Nicholas E. '56
Coffman, Vance D. '67
Davenport, Delbert J. '67
Hoversten, Estil V. '58
Ryan, Thomas E. '52
Shepherd, Kevin J. '83
Stanley, P.E., Richard H. '55
Stout, Thomas M. '46
Sutherland, Keith Allan '69
Wallace, Jean E. '81
IA B Corrao, Debbie G. '93
Lammers, Leon '59
Roach, John U. '78
Schmidt, Charles C. '73
Schwarting, Eugene R. '63
Warner, Diana H. '73
KS A Johnson, Lee S. '77
Looney Jr., Chesley H. '50
Metzger Jr., James I. '60
Westlake, Joseph D. '55
KS B Wilson, Bryan K. '85
KY B Trafton, James O. '53
LA A Richardson, John D. '72
Schexnayder, Isby L. '63
Smith, Stewart V. '73
LA B Cappel, Thornton L. '44
LA Γ Smoak, Albert M. '84
LA Δ Lejeune, James J. '73
ME A Ouellette, Alfred D. '76
Richter, Robert A. '50
MD A Gates, Allen Francis '50
Linaweaver, F. Pierce '55
Thomas, Arthur M. '54
MD B Beville Jr., Ross Harwood '62
Moorcones, Joseph J. '67
Powers, Kenneth Ryan '01
Roberts, Carla Field '82
Stertzbach, Karl '72
Zalesch, Steven E. '73
MD Γ Merritt Jr., Charles R. '85
MA A Alley, Christopher P. '85
Chapell, Harry F. '54
Horrigan, Lawrence B. '56
MA B Argani, Cynthia Holcroft '92
Balazs, Phillip T. '69
Giaimo III, Edward C. '74
Kellogg, John H. '48
Kornafel, Peter R. '65
Martel, Philip O. '72
Oien, Harley M. '70
Slifka, Richard B. '61
Venturini, Eugene L. '67
Vlahakes, Gus J. '71
MA E Engler, Harold F. '75
Hayden, Thomas L. '62
Pinkham IV, Thomas A. '88
MA Z Kelly, Thomas W. '80
MA H Maneval, Daniel C. '82
MA I Musiak, Ronald E. '68
MI A Bachman, Charles W. '48
Gardner, John A. '77
Kietzman, William C. '65
Kupfer, Michael David '83
Kuzma, Dennis C. '58
Regenstreif, Joyce '78
MI B Henriksen, Leslie L. '58
Masica, Richard L. '58
MI Γ Bell, Lawrence D. '68
Burton, P.E., James R. '48
Cameron, John J. '66
Connable, Tenho S. '42
Greene, Edward B. '51
Hammond, Donal D. '52
Hansen, Charles '46
Hertler, Eugene G. '50
Holmes, John W. '65
Johnson, Kalin S. '46
Maugh, Roger E. '55
Nobunaga, Brian N. '83
Root, James W. '52
Scott, Richard A. '57
Stoddard, Frank J. '60
Vlasic, Robert J. '49
Washburn, John R. '69
MI Δ Rossi, Nicholas M. '63
MI E Brooks, Vern E. '60
MI Z Cashman, Robert M. '50
Kovacs, Robert L. '86
Wright, Hugh D. '55
MI H Czupinski, Glenn W. '83
MI Θ Cischke, Susan M. '76
Garrity, Stephen Daniels '72
MN A Loftness, Paul E. '83
Van Essen, John S. '74
MS A Cargile, James D. '81
Jones, Donald R. '61
Siler, Raymond D. '83
Stephens, Jack D. '83
MO A Currie, Wayne L. '59
Oehrke, Timothy C. '75
Woolsey, John Rodney '70
MO B Arnoldy, Richard R. '69
Boston, Lawrence A. '60
Fennewald, Gary J. '73
Frankenberger, Richard B. '93
Mahin, Clifford A. '76
Pannone, Gregory M. '82
Schwent, Dale G. '84
Weber, Albert L. '53
MO Γ Feldman, Arthur '52
MT A Myers, John D. '60
Pearce, Mary Ann '76
NE A Baeder, Mark A. '82
Patterson, Roger K. '73
Shaneyfelt, Marty R. '84
NH A Penney, Francis W. '51
Stirk, James A. '81
NJ A Bendelius, Arthur G. '58
Bunyaner, Michael '81
Lipton, Sydney '50
Seventko, M.D., Joseph M. '60
NJ B Boysen, Robert L. '63
Page, Robert H. '49
Rodgers, Douglas N. '67
Vandergrift, Wayne J. '47
NJ Γ Dvorin, Martin '58
Ehrgott, Murlin C. '49
Mandle, John B. '52
Minardi, Vincent C. '66
Mozda, Stanley J. M. '69
Sharon, Anthony P. '74
Tucker, John H. '67
Zozzaro, John L. '64
NJ Δ Rafieyan, Kamran Lee '89
NM A Peace, Jeffrey H. '76
NY A Franco, Peter F. '76
Kundakci, Vace '73
Lee, Harry G. '46
Selius, Albert O. '87
NY B Ballaro, Charles A. '87
Bickley, Thomas D. '78
Lee, Chung M. '85
Poulsen, Neils R. '57
Wedlake, Raymond A. '73
NY Γ Brand, Terrance Alan '90
Geschwindner Jr., P.E., Louis '67
Gray, Robin B. '46
Hall, Kenneth H. '52
Huie, Joseph A. '52
Joyce, Michael E. '82
Miller, Rollin T. '46
Richards, Howard C. '53
Schultz, Stephen Parker '70
Teich, Steven '76
Weader II, Richard J. '64
Zadoks, Abraham L. '57
NY Δ Jones, Paul S. '51
Stumpe, Warren R. '48
NY E Martin, Kent R. '66
Siegel, Ph.D., Murray Harvey '63
Simmons Jr., Edward J. '66
Wechsler, Lawrence D. '55
NY Z Mendel, Jerry M. L. '59
Tuchband, Stuart M. '63
Zieve, Robert M. '55
NY H Beron, Michael '71
Goodman, Alvin S. '44
Lauer, Spencer D. '67
Pasquarelli, Louis R. '73
NY Θ Candelora II, John Philip '91
Hearl, Steven C. '80
NY I Wernau, William C. '68
NY K Alcaro, Domenic J. '87
Casper, David A. '88
McGurk, Leon H. '59
NY M Montgomery, Michael E. '75
NY N Marso, Rudolf '59
Zarchy, Andrew S. '73
NY Π Kaemmerlen III, John T. '76
NY P Solaski, Thomas P. '85
NC A Blair, John R. '77
Hunter, J. Stuart '47
Mauney, C. Herman '53
NC Γ Jackson, James R. '69
NC Δ Daemer, Gary G. '92
Hinkle, Mark Otis '96
Jones, Luellen B. '83
ND A Jacobsen, John W. '69
ND B Dehen Jr., James J. '80
OH A Cazier, John M. '50
Oravec, Joan M. '71
Shape, Frederick M. '54
Smialek, Jim L. '68
Tozer, Richard F. '61
Whittington, John Thomas '83
OH B Allspach, Eugene R. '70
Bickham, Kenneth L. '63
Totten, James E. '56
Yost, David Brian '87
OH Γ Kinzel, Evelyn S. '69
Kinzel, Gary L. '68
Orkins, James E. '66
Ouellette, Andrew Louis '86
Robinette Jr., William H. '68
OH Δ Beach, Ph.D., P.E., Theodore '87
Brown III, Claude M. '74
Kurzen, Mark R. '71
Robe, P.E., T. Richard '55
OH H Fraass, Ronald G. '78
Gressang, Randall V. '72
Lehmann, William L. '44
OH Θ Beimesch, Wayne E. '68
OH I Brinkman, Donald J. '87
OH A Eckhardt, Andrew J. '79
OK A Blakeburn II, Dave Lowry '83
Griffin, James P. '75
Herzmark, Ralph A. '44
Kerr, Clayton Phillips '61
West, Earl R. '59
OK B Blais, Roger N. '66
Waldorf, John W. '83
OR A Laos, Oscar J. '51
Leonard, James P. '77
Milton, Stuart W. '84
Sias, James F. '57
Sigworth Jr., Harrison W. '68
Stranahan, Chapman A. '65
PA A Edwards, Gilbert S. '67
Koppes, Alan W. '53
Kroboth, Michael E. '72
Lynch, Sarah Hayward '89
Tavianini, David '82
PA B Anderson, Charles A. '57
Best, William J. '80
Cirota, Marcie D. '95
Dietz, Mark S. '80
Fisher, Robert H. '72
Gasda, David C. '70
Longenecker, John R. '71
Moore, Albert L. '56
PA Γ Dvorsky, James E. '81
Hoch, Orion L. '52
Shaffer, David B. '68
PA E Clark, Gordon B. '51
Coffey, James M. '75
Kuhn, William L. '67
PA Z Ebner, Alan M. '61
Mergel, Joseph J. '72
Pennoni, P.E., Celestino R. '63
Struckman, Russell W. '64
PA H Ellis Jr., Ira T. '56
Hotchkiss, Jeffrey R. '69
McDonnell, Robert W. '48
PA Θ Coyle, Todd F. '77
PA I Smith Jr., Donald Benedict '91
RI A Healy, Henry S. '71
Kenney Jr., Joseph '50
Saharian, Alexander '56
Vigar, Judith W. '83
RI B Binns, George '59
SC A Corpening, Joseph B. '72
Liskey, James D. '71
Rankin, Anne Marie '90
SC B Fischer, Belinda Ann '94
Moore, William Edwin '59
Shippey Jr., Kelley F. '64
SD A Massie, Larry W. '82
TN A Ayers, William R. '80
Barnhart, Philip W. '48
Cook Jr., Joseph C. '65
Hueser, David L. '76
Layman, Ronald Terry '77
Mynatt Jr., Roy L. '58
Sansom, William B. '64
Shafer, Robert W. '47
TN B Brown, Kevin G. '85
TN Δ Miles, Thomas O. '81
TX A Fahel, Ramsey Alan '81
Finley, Mark H. '63
Malins, Chester J. '76
Smith, Daniel R. '75
Turner, William D. '61
Warzecha, Ladislaus W. '48
White, Karen T. '84
Zwernemann, Gregory R. '76
TX B Rossler, Steven W. '73
Williams, David C. '47
TX Γ Altman, Thomas Clark '70
Cox, William E. '76
Lodal, Jan M. '65
Turvey, Harry D. '73
TX Δ Bradford, Craig Allen '93
Dement, James R. '74
Kasch, Vernon R. '73
Muldrow, Grady M. '89
Pulley, Paul W. '87
Smith, Manning D. '64
Strait, William L. '49
Zimmerman, Keith D. '89
TX Z Hambrick, Joanna R. '86
TX H Nooyi, Raj K. '78
TX Θ Alvarado, Ruben A. '72
Foster, Ottis C. '82
TX Λ Alsop, Albert W. '80
UT A Lamph, Jane Ann '80
VT A Cimonetti, William J. '59
Scribner, Charles F. '70
VT B Urciuoli, Joseph C. '68
VA A Anderson, Willie C. '75
Donoho, Thomas E. '59
Harris, Wesley L. '64
VA B Hyduke, Robert A. '74
Snidow III, Lyle C. '74
VA Δ Browder Jr., James G. '66
WA A Jabusch, Donald A. '60
McCalla, William T. '56
Otteman, Lloyd G. '54
Sahakian, Zareh M. '81
WA B Oakley, Fanning T. '53
WV A Lengyel, Nicholas M. '70
Ramsey, Walter J. '74
Rockenstein, Richard C. '63
Sutton, George E. '48
WV B Ashman, Michael D. '84
Saultz, James E. '50
Spencer, Michael R. '80
WI A Beutler, Arthur J. '48
Cattoi, Robert L. '50
Hoffman, Carl A. '85
Johnson, Joseph W. '79
Wolff, James F. '59
WI B Delgado, Jose M. '69
Whittington, Laura Lee '88
WI Γ Groschupf, Mike S. '87
WI Δ Whalen, David Alan '91
WY A Welch III, Thaddeus Baynard '79
Worden II, James B. '77

SECOND CENTURY CLUB

AL A Anderson, Pete L. '75
Colburn, Bruce K. '71
Farlow, James C. '49
Miller III, Edwin H. '84
AL B Hopkins III, P.E., Walter G. '64
Sims, Kenneth L. '71
AL Γ Gilbert, Rodney C. '67
AK A Miller, John M. '60
AZ A Bischoff, Stephen J. '73
Brock, Steven B. '66
Durr, Robert W. '87
Krauss, Leroy E. '50
Krisa, Kenneth C. '82
Leonardi, Suryanto F. '86
Robidoux, Phillip H. '80
Svensson, Arthur '66
AZ B Takinen, Scott A. '79
AR A Hensley, Edward K. '52
Jones, Michael D. '67
Mantooth, H. Alan '85
Perciful, Jerry C. '60
Williams, Curtis R. '63
Zaleski, Michael E. '63
CA A Berger, Augustus B. '48
Chan, Sunney I. '57
Gourdin, William H. '72
Humphreys, George B. '51
Love, Brian Randall '04
Secor, Kenneth E. '55
Serr, Eugene F. '46
CA Γ Austin, Lyman D. '61
Barnum, James R. '65
Reneau, Leon R. '58
CA Δ Brooks, James R. '72
Delvin, Sandra Anne '76
Froehlich, Carl Heinz '74
Haririan, Vida N. '94
Hedin, Richard A. '69
Kester, Larry A. '78
Lisiecki, Linda Christine '69
Shields, Linda '84
CA E Hillman, Charles R. '67
Hong, Phillip Robert '98
Reichert, Ralph J. '67
Schreiner, Sheldon I. '64
Testa, Lori Ann '01
Walker, David A. '78
CA Z MacDonald, James T. '77
Masutomi, Daniel K. '87
Mooney, Frank C. '58
CA H Eaton, Sherman J. '65
Thornton, Roger Lane '93
CA Θ Blanco, Catherine Elaine '97
MacInnes, Hugh D. '83
Skalka, Gregory D. '82
Stone, Ronald E. '66
CA I Dovala, Richard J. '71
Lu, Kenny Cuong Vu '00
Middleton, Ralph E. '61
Wrigley, Chris J. '96
CA Λ Johnston, Brian David '95
Mock, Kenrick Jefferson '90
Rizzardo, John Joseph '91
Schmitz, James A. '83
Smith, Robert P. '75
CA M Johnson, Bruce W. '78
Maas, Jason G. '86
CA N Lansing, John Robert '79
Lopez, Mike '95
Mayer, Robert J. '85
Ortiz, Janet M. '82
Schmitt, Thomas G. '74
CA Ξ Greco, Anna Maria E. '81
CA P Koehn, Calden Ray '81
Koehn, Lisa T. '82
Markarian, Thomas Franklyn '95
CA Σ Booth, Andrew Joseph '08
CA T Hoang, Khue Van '91
CA Φ Oatman, Brian Andrew '91
CA X Michaels, Philip George '91
CO A Bonham, Lyle V. '71
Cochran, P.E., Noelle R. '86
Crichton, David Drewry '97
Haycraft, Thomas W. '73
Kidnay Jr., Arthur J. '56
Peterson, Steven D. '72
Trembly, Steven Alan '93
CO B Austin, Stephen C. '74
Drexel, Charles F. '43
Erickson II, Thurston G. '74
Joselyn, Jo Ann '65
CO Γ Lee, Don E. '59
CO Δ Baldwin, Lionel V. '54
CO E Thompson, Gregory O. '01
CT A Berger, Ph.D., Toby '62
Mengwall, Martin Lennart '94
CT B Cook, Rosanne G. '80
Hawkins, John E. '38
Hill, Dorian E. '69
Mastracchio, Robert '64
DE A Bradley, Kevin Patrick '91
Halfen, Charles W. '80
Keyser, Kevin Justin '88
DC A Hull, Wayne K. '59
DC B Roberts, Carol Ann '63
Roberts, John Paul '62
FL A Evans Jr., Andrew J. '75
Mennes, C. Martin '68
Militello, Sam '61
O'Brien, Michael P. '88
Townsend, Frank Charles '62
Walton, Raymond '77
FL Γ Chenkin, Joseph A. '82
Pennington III, John W. '71
GA A Challain, Leonard J. '54
Damon, Henry E. '49
Jory, Virginia V. '71
Layden, Elizabeth C. '87
Layden III, Joseph Calvin '87
LeCroy Jr., Edwin P. '67
Northington, Peyton A. '78
Siemens III, John F. '75
Tundermann, John Hayes '63
Zimmerman, Clarence D. '65
IL A Else III, Daniel H. '73
Lanzerotti, Louis J. '60
Marlowe, Lyle H. '65
Mueller, Vernon Charles '59
Olp, Kenneth J. '87
IL B Hartwell, Robert A. '81
McBlaine, Michael R. '75
McKerlie, Clyde J. '59
IL Γ Carlton, Herbert E. '48
Keables, Erin '84
Pineault, Wayne '79
Wong, Thomas T. Y. '80
IL Δ Zapinski, Susan M. '83
IL E Zimmermann, Thomas G. '78
IN A Banks, William B. '50
Bertsch, Patricia B. '76
Bicknell, Bruce A. '68
Billian, Mark Wayne '93
Corns, Joseph B. '52
Croop, Harold C. '70
Edwards, Deborah J. '85
Eykamp, G. Richard '56
Fosnaugh, Billy L. '55
Heintz, David J. '83
Lyon, Richard C. '56
Mansmann, Donald J. '82
Muehlbauer, James H. '63
Rich, Warren E. '53
Sheets, Paul W. '82
Simnick, James John '74
Stilger, Donald L. '81
Whelan, Robert G. '49
Wolff, Jay R. '48
IN B Friel, Leroy '57
Marum, Steven E. '73
Rinker, Robert G. '51
IN Γ Black, Raymond J. '63
Grunert, William E. '60
Henry, Eugene W. '54
Luckett, Dirk R. '79
IN Δ Hartman, Richard C. '63
IN E Finley, Ph.D., P.E., David R. '94
IA A Anderson, Melvin S. '52

Cowles, Harold A. '49
King Jr., Maurice A. '67
Paustian, Harold H. '73
Sande, Jerry D. '76
Slater, John B. '43
IA B Fuller, Ray A. '50
Moeller, Howard F. '51
Wheeler, Kathleen E. '92
KS A Miller, Robert E. '52
KS B Hull, Donald L. '64
Steranka, Sylvie Dalle '89
KS Γ Boguski, Terrie K. '81
Minks, Dan E. '83
KY A Blevins, Parker R. '64
Craig, Joe L. '50
Galbraith, John D. '85
Mullins, Chuck '87
Wood, Philip F. '74
KY B Hauenstein, Bruce R. '76
LA A Champagne, Sidney A. '68
LA B Guzman-Garcia, Angel G. '86
Hosey, Ronald R. '79
La Rocca, Anthony J. '49
LA Γ Feazell, Megan Dagate '07
Feazell, Stephen Anthony '07
Hall, Freddie R. '56
Randall, James B. '79
LA Δ Blaylock, Martin E. '61
Halkiades, George '63
LA E Parker, Riley Matthew '98
MEA Connor, Edward J. '53
Havey, Mark D. '73
Johnson, Philip M. '55
McCarthy Jr., Robert H. '68
Ogden, Stephen W. '79
Richardson, Paul W. '56
Simerl, James H. '70
MD A Hart, Edwin F. '68
Zehner, James W. '80
MD B Bentz, Dale P. '84
Dimarzo, Marino '76
Eberly, Steven Craig '87
Johnson, H. Joseph '81
Kalpas, Raymond A. '63
Marks, Richard W. '70
McCracken, Richard P. '70
Poulter, Harry D. '88
Rosen, William J. '60
Wamsley, Brian W. '77
Whitehead, Edward R. '62
Yourshaw, Sheryl Lynn '99
MA A Haringa, Glenn E. '74
Lindquist, Richard W. '54
Saltus, George E. '53
MA B Borrmann Jr., George H. '57
Butkus, Lawrence M. '85
Cox, Russell N. '49
Delagrange, Arthur D. '62
Efimba, Sc.D., P.E., Robert '63
Marx, Austin F. '49
Midney, John H. '47
Spradlin, Louis W. '57
MA Δ Benedict, Kurt G. '59
Cashman, William F. '64
Flaherty, Joseph C. '84
Hildebrant, Eric Michael '92
Kurkowski, James F. '84
Wolff, Howard E. '47
MA E Boshart, Kenneth J. '70
Katsoulas, Peter C. '70
Lichtig, John F. '83
Presume, Hantz Antony '89
MA Z Beliveau, Thomas J. '69
Burstein, Ph.D., Michael C. '64
Costa, Bruce A. '79
Crain, Melvin C. '50
Kearns, Robert F. '58
Rainville, Robert F. '68
Stumpf, Christian R. '82
MA Θ Chapman, David M. '83
MI A Arnold, Charles J. '59
Beimers, Charles J. '69
Berk, Kevin Jon '84
Ruth, Gregory Philip '86
Shaffer, Jamie Lyn '87
Watanabe, Gerald T. '72
MI B Edquist, Carl F. '77
Groeneveld, Gerald A. '63
Hodgson, Darel E. '63
MI Γ Ardis, Robert B. '46
Bigelow, Wilbur C. '44
Bull, Joseph S. '52
Burkholder, Earl F. '73
Capelli, Ronald B. '73
Davis, Robert A. '81
Ellis, Gene E. '50
Evans, William J. '60
Fertel, Howard K. '79
Hedding, Dale P. '61
Koops, Leigh W. '72
Leeds, Thomas M. '85
Lisiecki, Robert Joseph '78
Malloch, Charles D. '57
McCormick, James R. '58
Meilinger, Robert B. '94
Othman, Roger M. '74
Rogne, Timothy J. '78
Rooke, Paul A. '80
Travers, Arthur '59
Trecha, Theresa M. '81
Zevalkink, Michael R. '71
MI Δ Brining, Dennis W. '68
Cairns, J. Robert '54
Elward, Robert M. '75
Zack, Chester V. '50
MI E Capraro, Michael A. '70
Coleman, Edward R. '57
Renton, George W. '63
MI Z Grubbs, Ronald D. '73
Morel Jr., Lawrence J. '76
Roth, Maureen Lynn '91
MI I Flowerday, Andrew John '02
MN A Anthes, John A. '34
Fitch, John N. '66
Johnson, John L. '50
MS A Blake, Charles R. '69
Carman Jr., Jack B. '62
Cook, Bobby J. '53
Dixon, Charles J. '56
Gelman, Stephen '73
McDonald Jr., Harold R. '65
Wachs, John J. '71
Yates, Karen W. '73
Yates, Michael Douglas '74
MO A Haferkamp, Jeffrey J. '76
Zimmerman, Mary M. '87
MO B Bigas, Jessica D. '00
Hahn, Gail L. '82
Patterson, Michael A. '77
MO Γ Diboll, Wallace B. '44
Eddy, James Dale '80
Klein, Milton '44
Sax, Franklin S. '55
Standridge, Charles R. '75
MT A Ausmus, Guy H. '78
Erickson, Peter B. '56
NE A Cowling, Edgar C. '75
Fuchser, Fay E. '51
Nelson, Stuart Owen '50
Paxton, William G. '87
NV A Davis, Adrianne Marie '98
NH A Ignaszewski Jr., Clyde J. '49
Kieffer, Roger A. '61
Scharfe, Alan C. '78
NJ A Mac Millan Jr., Duncan J. S. '66
Meyer, Alfred P. '60
Reinhardt, Gregory C. '65
Van Arsdale, George D. '62
NY E Kuhn, Alfred '57
Mletzko, Alfred E. '64
Ueber, Russell C. '61
Weissman, Martin J. '58
NY Z Kaczmarek, Richard '73
Parisse, Richard Frederick '61
NY H Filippi, Allan J. '72
Lum, Jean Ping '85
Metzger, Ernest Hugh '49
Peaceman, Donald W. '47
NY Θ Donaher, Thomas P. '56
Faigle, Gary V. '78
Fine, P.E., Morton S. '37
Flack, William James '64
Grubb, Michael A. '78
NY I Berger, Jack S. '61
Cassella, Judith D. '71
Grant, Richard J. '88
Hauge, Kenneth '61
Roos, Gregory J. '79
Zwillenberg, Melvin L. '60
NY K Ablowitz, Mark J. '67
Dennis, William J. '74
Hutchings, Donald W. '61
Peters, Kenneth J. '87
NY A Cilento, Eugene V. '73
Ganetis, George L. '78
NY M Renzi, Leah F. '80
NY N Davis, James S. '70
Hoye, Timothy J. '84
Lauermann, Mark E. '92
MacLagger, Robert C. '73
Tabaczynski, Rodney J. '66
NY Ξ Ball, Michael J. '72
Haller, Marc F. '85
Sanderson, Ellen I. '81
Tamaro, George John '59
NY O Hofmann, Linda '79
NY Π Howles, Douglas '76
Schmoll, Joseph H. '81
Tannen, Peter D. '57
OH Θ Burkardt, Leo A. '67
Kramer, Lawrence J. '62
McEldowney, Ralph A. '87
Usleman, Robert T. '71
OH I Muskoff, Terry E. '67
OH K Bennett, Ronald Q. '76
Carver, Robert M. '87
Duffy, Stephen F. '78
Stimler, Jeff J. '84
Stimler, William E. '83
OH Λ Suhar, P.E., Richard A. '83
OK A Spangler, Jon A. '90
OK Γ Matson, John Andrew '02
Sneed Jr., Elbert Lee '79
OR A Allen, Scotty R. '82
Anderson, Joseph R. '66
Cantwell, Gary K. '80
Jenks, Steven G. '73
Shaw, James W. '70
PA A Arrowsmith, Donald L. '65
Bradley, Gordon H. '62
Granville Jr., Richard W. '55
Jones, Donald P. '65
Knorr, David B. '74
Labovitz, Judith Ann Y. '86
Labovitz, Stuart Lewis '85
Marshall, Steven J. '82
Morse, Norman L. '40
Renshaw, Daniel T. '81
Ruth, Richard L. '68
PA B Artz, Robert B. '51
Cashdollar, Barron H. '57
Ferenci, Jack E. '75
Hertneky, John A. '79
Mumma, Jeffrey S. '80
Smith, Charles J. '42
PA Γ Chang, Yue Cathy '00
Husak, Alan D. '65
SD A Grote, Brant C. '76
Stieha, John Kevin '80
TN A Diaz, Amy A. '96
Hitch, Benjamin F. '67
Jenkins, Alvin L. '61
King III, Philip W. '66
Lacey III, John W. '69
Peugeot, Richard Scott '60
Rasnake, Mark Steven '94
Scandlyn, Thomas W. '49
Sheffey, David W. '66
Stewart, John W. '65
TN B Baker, Bonnie B. '71
Nicoladis, Michael F. '82
Zabriskie, Kenneth A. '80
TN Γ Haile, P.E., Robert John '94
Harvey, James B. '63
Pedigo, Donald B. '83
TX A Angel-Jaramillo, Danilo '61
Kuenast, Walter U. '78
Nix Jr., Cecil A. '57
Peet, Ed '69
Stanbery, Sam R. '64
TX B Smith, David L. '71
Walter, Kevin Carl '88
TX Γ Capshaw, David M. '80
Chisholm, Roy D. '48
Flatt, Robert N. '69
Kobayashi, Riki '44
Smith, Fred L. '62
TX Δ Armstrong, Bryan Marcus '95
Boedecker, Thomas J. '64
Bunch, John M. '81
Cook, Michael F. '78
Davison, James L. '54
Dowling Jr., Cloyd J. '51
Garner, Scott J. '77
Gray, Foster L. '53
Woram, Brian J. A. '81
TX E Martin, Samuel R. '83
TX H Hall, Gary D. '84
TX Θ Davis, Richard C. '79
Goolsby, Tommy D. W. '84
TX Λ Carter, Jason O. '87
Carter, Norhanani B. '87
Saenz, Ida F. '84
UT Γ Cleave, Mary L. '79
VA A Ashton, Michael D. '74
Benneche, Paul E. '74
Dye, Michael L. '87
VA B Croy, Alvin Q. '54
Cundiff, USA Ret., Lester B. '43
Maloney, Melissa M. '90
Painter, Robert A. '48
Spangler, C. Leigh '82
VA Γ Bergrab, Stephen T. '79
VA Δ Bunch Jr., Jennings B. '50
Michael, Glenn P. '66
WA A Hage, Robert E. '39
Melton, Ronald B. '77
Moose, David M. '54
Orr, Peter C. '71
WA B Myers, Richard M. '80
WA Γ McCauley, Edward W. '53
WV A Lilly, Larry J. '64
WV B Hainer, Victor Keith '00
WI A Antolovich, Stephen D. '62
Bernstein, Theodore '49
Davis, Scott P. '78
Devoe, Michael J. '78
Fifer, Larry D. '83
Tausche, Paul E. '48
WI B Donovan, D. Michael '67
Ellis, Thomas E. '84
McMorrow, Daniel Patrick '98
Pickett, Mark A. '72
Schutz, Ronald J. '78
WI Γ Jenn, David C. '75
Scherer, Richard A. '74
WY A Cavalli, Matthew N. '98

COMBINED FEDERAL CAMPAIGN

Tau Beta Pi has been included as an eligible organization on the 2013 Combined Federal Campaign (CFC) national list. The CFC is the annual workplace fundraising drive conducted by federal employees and military personnel each fall, which raises millions of dollars benefiting thousands of nonprofit charities. Tau Beta Pi has participated since 2000.

Tau Beta Pi will appear in the listing of National/International Organizations which is published in each local campaign brochure. Your donation will be directed to Tau Beta Pi by using the CFC identification number 10960.

In previous years, our Association has received thousands of dollars annually from this campaign. Unfortunately, the many local agencies gathering donations for the campaign are not able to provide us with the names of all of the donors. Because of this, a donation made through this campaign may not be included in a member's giving record. Please know that the contributions are used to support the Fellowship, Scholarship, Laureate, and District Programs.

Thank you to all who have contributed to Tau Beta Pi through this campaign!

Ricco, Robert P. '70
Tabola, Michael D. '84
Tirado, Daphne Christine '82
NJ B Adams, Frank G. '53
Bond, Charles B. '80
Colarusso Jr., Remo J. '83
De Witt, Russell '50
Herrmann, Eric P. '69
Rabin, Daniel E. '73
Tanner, Robert B. '64
NJ Γ Castaldi, Frank J. '69
Puhan, Robert '75
NJ Δ Bush, Warren V. '53
Gross, Gary R. '80
Mills, Franklin P. '84
Stern, Hal L. '84
NM A Harcum, Sarah W. '86
NM B Sullivan, Thomas D. '74
NM Γ Bonjorni, Daniel Louis '90
NY A White, Ralph P. '51
NY B Carpenter, Richard Crouch '51
Demyanovich, Sara E. '85
Landau, Louis H. '49
Perkins, Richard Wilson '54
Plehn, James G. '47
Ragonese, Louis J. '56
Spearot, James A. '67
Zastrow, Kenneth D. '52
NY Γ Diefenbacher, Robert H. '59
Dowgwillo, Robert Michael '75
Fredericks, Robert J. '48
Goldschmidt, David Joel '91
Hirschman, Gordon B. '78
Lynch, Karen Allen '86
McKersie, Alan D. '52
Savage, Robert E. '43
Zmroczek, Leon A. '78
NY Δ Johnson, Eric Tanner '00
Kuehne, Donald L. '73
Reynolds, David Allen '71
Sasso, Joseph A. '70
Richenderfer, Tommie G. '77
NY P Colella, Donald A. '78
Hartmann, Martin R. '83
Lubrano, Michael '80
NC A Ammons, Andrew Louis '82
Burkart, Alex R. '72
Doggett, William R. '86
Karesh, Lewis J. '81
Quillian, Ann M. '85
Shepherd, Steven Olin '94
Sloop, Danny H. '74
Weirs, Vincent Gregory '91
White, Samuel E. '69
NC Γ Maxson, Robert J. '62
ND A Johnson, Robert J. '81
Sauvageau, Donald Richard '70
OH A Drier, Delmar W. '52
Garman, Kenneth C. '44
Kitinoja, Elmer A. '53
Mergler, Harry W. '48
Moorhead, Kenneth W. '50
OH B Christie Jr., Ralph W. '73
Cook, Kenneth F. '74
Hart, Thomas R. '66
Shields, John L. '75
Thompson Jr., John R. '60
OH Γ Armstrong, Robert J. '51
Beitler, Richard S. '50
Chadwick, Harold E. '65
Stephenoff, Mark S. '79
Verner, William J. '58
OH Δ Keith, Charles L. '74
Penko, Paul F. '67
Zajac, Theodore S. '52
OH E Konsevick, Walter J. '53
Kubinec, William R. '67
OH Z Proctor, Margaret P. '82
OH H Breuder, Andrew J. '70
Eggers, James A. '72
Marler, Martin L. '76
Miller, William Gilbert '83
Kornuta, Nick J. '81
Kuhr, Ernestine M. '81
Sack, John S. '75
PA Δ Heath, Frank R. '51
Hocker Jr., Robert G. '71
Hoffer, Norman K A '81
Reardon, Frederick H. '54
PA E Batdorf, Harold A. '70
Donofrio, Robert A. '71
Kulicki, John M. '65
Roth Jr., David W. '51
Young, Douglas A. '86
PA Z Browne, Joseph D. '60
De Maio, Joseph A. '75
Eisenberg, Eric Jay '88
Nadzadi, Mark Ellsworth '99
Patti, Francis J. '50
Rummler, William D. '59
Schubele III, Charles W. '60
PA H Besselievre, William C. '63
Howes, Michael L. '75
PA Θ Addotta, Robert F. '77
Russo, Richard A. '68
Volkay-Hilditch, Christine M. '83
PA I Schoenberger, Lewis Robert '84
PA K Shield, Carol K. '84
PA Λ Steranka, Paul Ott '76
PR A Hilerio-Sanchez, Josuan '07
RI B Adamedes, Zoe '84
Fletcher, Gilbert A. '68
SC A Barnwell Jr., Thomas O. '69
Blandford Jr., Joseph B. '58
Di Lapi, Christine M. '87
Gachago, Njeri Muriithi '09
Gray Jr., Blaine E. '72
Paskel, Shella Ann '86
Peters, William J. '70
Siokos, George Z. '48
SC Γ Lindsay, Craig T. '86
McKnight Jr., Clarence E. '52
Wertheim, Robert Halley '45

FOUNDER'S CLUB

AL A Josephson, William Ernst '87
AL B Carr, Emily G. '77
Davidson, Janet Sims '78
Naughton, Joseph D. '60
Pearson, Marcus L. '63
Ramsey, James D. '64
AL Γ Ingram, Eddy L. '80
AZ A Johnson, Donald E. '60
AZ B Polk, Steven R. '74
Wilson, Richard A. '72
AR A Dockery, David E. '76
Lehnen, Robert Anthony '90
Moody, Charles R. '58
CA A De Maria, Charles D. '41
Hall, Robert M. '70
Jacobs, Lydia S. '76
Yap, Grace H. '81
CA B Hearn, David R. '64
CA Γ Ezekiel, Alan W. '90
Gable, Robert E. '56
Grolle, Timothy F. '78
CA Δ Iwai, Derek T. '80
Moretti, Vincent C. '62
Oslick, Harvey R. '87
Scottoline, Charles A. '61
Woyshner, David J. '84
CA E Asaro, Catherine Ann '78
Struhl, Stanley F. '61
Vehrencamp, John E. '50
CA Z Haughton, Kenneth E. '52
Wolfgruber, Thomas Kai '01
CA H Daniels, Ramin '91
Elkins, Perry E. '59
Lima, James Alphonso '61
Vasudev, Anand '89

FOUNDER'S CLUB, CONTINUED

Wang, Hui-Zhi A. '88
CA Θ Cook, John R. '76
Koerber, Matt J. '95
Nguyen, Tam T. '81
Seigman, Paul A. '95
CA I Samaras, Thomas T. '59
Sun, John '85
CA M Kirkpatrick, Steven E. '80
CA N Shatila, P.E., Makrom H. '02
CA Ξ Holcomb Jr., Donald E. '73
Oneil, Patrick M. '82
CA P Hall, Mark Corwin '88
Hewitt Jr., Robert A. '86
Hurst, Brad M. '88
CA Σ Rubino, Kimberly Christine '95
CA T Buttacavoli, Kara A. '97
CA AB Stenger, Michael Thane '02
CO A Benton, John H. '78
Burch, William L. '44
CO B Jolley, Malcolm C. '74
Lippert, Thomas L. '78
Strange, Lynn M. '81
CO Γ Altman, Donald C. '57
CO Z Warner, Nicole Michelle '09
CT A McEligot, Ph.D., Donald M. '52
Watson Jr., Richard B. '73
CT B Lizdas, Daniel J. '61
Pollack, Edward E. '70
DC Γ Laguarda, Leonel '79
FL A Ireland, Ronald J. '61
Van Horn, USA Ret., William '82
FL B Hernandez, Albert A. '86
Nunez, Ramon L. '75
FL Γ Meloy, Robert M. '81
Miller, Joseph R. '73
FL Z Delaurentis, Daniel Andrew '92
GA A Schreiber, Don C. '91
ID A Beaudoin, Brian F. '81
Diedrick, Justin Michael '00
Ketchum, Steven L. '85
IL A Alagappan, Vairavan '86
Barton, Henry O. '49
Drolen, Bruce L. '78
Drozt, Jennifer L. '92
Groothuis, Neal King '02
Guill, Daniel A. '73
Hendron Jr., Alfred J. '59
Hillman III, Arthur Burgess '67
Jacobson, Jerome '50
St John, Robert C. '43
IL B Koeppe, Eugene C. '77
IL Γ Dorn, James D. '54
Wright, Susan L. '74
IL E Finocchio, Samuel D. '73
Hainke, Kristofer J. '96
Schneiderman, Jean M. '80
IN A Argon, Ali S. '52
Atterholt, James W. '57
Buck, Robert A. '51
Colville, James '59
Dix, Rollin C. '57
Flanigan, David L. '66
Gearan, USA Ret., William K. '58
Gotschall, William O. '55
Kelly, Paul D. '59
Lee, Robert E. '67
Matthews, Patricia A. '78
Minniti Jr., Robert J. '70
Muzzillo, William A. '81
Olin, David B. '52
Pigman, Stuart M. '50
Purucker, Joan B. '80
Sommers, Steven R. '78
Sudduth, Robert C. '79
Truax, Philip P. '54
Vander Velde, Wallace '51
IN B Pauls, Jeffrey D. '79
Repp, Brent T. '88
IN Γ Stanchina, William E. '71
IN Δ Tindall, Paul B. '68
IA A Burnet, George '48
Dick-Peddie, John I. '53
Gilman, Everett Lewis '51
Huber, Robin '93
Irvine, Alexander J. '79
Olson, Scott E. '69
Ryken, Mike J. '96
IA B Braet, Ronald L. '63
Davis, Renee L. '89
Smith, Richard K. '60
KS A Ashbrook, J. Douglas '66
Asher, Gary L. '65
Dyer, Kevin W. '85
Hinton, Robert A. '61
Peters, Paul E. '57
Sheridan, Hugh C. '69
Tackman, Norbert E. '61
KS B Golobay, Gary L. '72
Straka, James L. '89
KS Γ Berland, Stephen Lawrence '72
Roberts, P.E., Thomas Carrol '70
KY A Patton, Bradley D. '76
KY B Beavin, Rudy C. '61
Klingenfus, John A. '80
Reynolds, Joseph C. '48
Tyler III, Wayne Paul '91
LA A McClatchey, Lloyd D. '49
Petitbon, John B. '86
LA B Bell Jr., Frank A. '49
Licciardi, Dolleen M. '79
LA Γ Guice, Ph.D., P.E., Leslie K. '78
Harvey, Irvin M. '69
Sentell Jr., George W. '47
LA Δ Gannuch, Rodney J. '68
ME A Bowden, Warren W. '49
MacDonald, Joseph D. '68
MD A Hall, H. Thomas '56
Levine, Jeffrey S. '85
Sabater, Juan M. '60
Wallace III, William E. '86
MD B Coyle, William Joseph '00
Denny, Samuel A. '90
Dunnigan, Gerard J. '62
Gray, Donald L. '55
Leasure Jr., William A. '66
Mitchell, Reginald H. '72
Mortimer, Thomas S. '55
Roberts, Victor D. '64
MD Γ Kolley, Chester M. '85
McGowan, Ph.D., P.E., Joseph '90
Royal, Geoffrey Sterling '93
MA A Bassett, Leon H. '51
Cucchi, Thomas '85
Engman, George E. '50
Haley, Michael J. '90
Meyer, Robert A. '52
MA B Adcock, USA Ret., Thomas '63
Akant, Adnan '72
Boyd, USN Ret., John H. '59
Breen, Barry C. '70
Gusman, Samuel '46
Honigsberg, Charles A. '52
Jongbloed, Donald J. '53
† Kirchner, Mark E. '48
Morin, Gene D. '58
Nichols, Barbara Michelle '94
Saba, Robert B. '61
Savage, John E. '61
Stark, Robert E. '42
Weinstein, Roy Marshall '83
MA Δ Babaian, Peter Martin '99
Hablanian, David A. '80
Maltbie, Catherine Vadala '86
Serencha, Mark John '93
MA E Cadman, Gary R. '74
Chiodo, Richard A. '71
Devney, Peter '89
Hamel, P.E., Mark D. '77
Schoenfeld, Richard Alan '71
Takvorian, Andrea '82
Young, Charles W. '72
MA Z Kennedy, Philip J. '59
Sallah, Stephen J. '82
MA H Leung, Xwinx B. H. '87
MI A Beal, Timothy Allen '84
Herrick, Robert J. '68
Lowry, Peter A. '60
Moravek, Michael J. '78
Schnabel, Elaine L. '73
MI Γ Abelson, Michael Fowler '82
Andersland, Mark Steven '83
Ash, Russell A. '51
Brown, Marshall Joel '96
Chick, Kenneth Martin '91
Fox, Michael T. '73
Gniewek, Kenneth J. '77
Lindeman, Richard J. '49
Mitchell Jr., Frank J. '60
Ori, Luigi '71
Shastry, Ph.D., Rohit '05
MI Δ Huebner, Charles A. '58
Kelly, Gary M. '64
Nolan, James H. '73
MI E Cleary, Gary K. '71
Jerome Jr., George G. '94
Klaetke, George H. '55
Sigler, David R. '76
Witt, Jason Alan '98
MI Z Godfrey, James E. '48
MI H Kipp, P.E., Eric Michael '98
Leonard, Mark L. '84
MI Θ McMahon, Kathleen Simonyi '82
Witalec, James M. '84
Zarins, Paul S. '87
MI K Seymour Jr., Richard L. '97
MN A Adrian, Ronald J. '68
Barger Jr., Charles S. '54
Sanders, Ivar '68
Waletzko, Nancy Ann N. '86
MS A Bell, Charles V. '56
Dowdle, Walter L. '67
McVea III, Albert N. '79
Vernon Jr., Daniel '73
MS B Cheng, Chia-Yung '70
MO A Adams, Charles R. '65
Fink, Earl R. '56
Gardner, Roger W. '63
Malin, Robert C. '83
Manes Jr., Ezra E. '69
Phillips, James M. '68
MO B Brockhaus, Douglas A. '68
Brodhacker, John W. '44
Charles, Albert L. '78
Church, Charles H. '50
Dare, Charles E. '62
Duderstadt, Edward C. '58
Etling Jr., Norman G. '73
Greco, Mary J. '84
Kottemann Jr., Richard A. '82
Kyser, Dale Anthony '83
Sedovic, Pete S. '81
MO Γ Bell, Joseph H. '51
Hagedorn, Christopher Jon '95
Turley Jr., Clarence M. '50
MT A Fischer, Douglas A. '74
White, Richard H. '72
MT B Aguirre, Stacy M. '86
Montgomery, Wayne '83
NE A Sneed, Kathryn Kay '80
NH A Bickford, M. Dudley '59
Qualters, Kevin R. '85
NJ A Denzer Jr., George C. '61
Force Jr., Howard J. '76
Gertz, Alan S. '45
Rovins, William R. '82
Wertheim, Gunther K. '51
NJ B Badgley Jr., Robert H. '60
Edwards, Bruce M. '79
Errera, P.E., Samuel J. '49
Jagodinski, Lorraine W. '84
Ketchpel, Paul A. '51
NJ Γ Bornako, Gregory L. '70
Bross, Warren C. '56
Bryant, Robert W. '70
Jacobsen, Peter C. '69
Morgan, Dennis R. '68
Okoye, Chukwuka Kameme '96
Pasquale, Carl J. '47
Tehve, Toomas '64
Youssef, George '01
NJ Δ Kovatch, George '55
Moore, Christopher C. '87
NM A Tarbox, David G. '80
NY A Brooks, Arnold '47
Seader, David '67
NY B Lavery, Warren Thomas '67
Shippee, Robert C. '85
NY Γ Buttz, Charles W. '56
Maziarz Jr., Edward F. '66
McAninch, Ian Matthew '02
Timour, Sune E. V. '52
NY Δ Surovy, Randall J. '78
Willis III, William T. '66
NY E Dubey, Michael B. '47
Duffy, John A. '71
Kanchanagom, Danai '67
Torigian, Andrew '60
Wilson Jr., Ernest G. '66
NY Z Brook, John W. '56
† Hubbell, Clifton H. '42
Martens, John D. '93
Martin, Heidi Brumfield '93
Meissner, Robert P. '53
Radke, Charles E. '55
Wilk, Ralph M. '55
OH B Bour, Timothy G. '79
Cline, Darrin O. '89
Mayer, Robert L. '69
Schoo, Donald C. '60
OH Γ Jordan, Sarah Elizabeth '99
Vasko, Susan D. '79
Vermillion, Thomas R. '80
OH Δ Ankrom, Linda S. '79
Ballinger, Charles W. '72
Oatman, Thomas D. '56
OH E Borst, Richard A. '64
Diem, Priscilla S. '83
OH Z Miller, John J. '59
OH H Spector, Marvin '73
Thompson, George W. '68
OH Θ Marks, Steven J. '85
Trogus, Frank J. '69
OH I Hurtig, Juliet H. '91
Hurtig, Michael Lee '91
Marone, Victor D. '59
Williams, David J. '52
OH Λ Folk, Joseph William '98
Novak, Michael Richard '96
OH M Beck Sr., P.E., Clark E. '55
Huff, Richard Keith '94
Michalak, Travis Edward '03
Van Tassel, James H. '57
OK A Hoffman, Keith W. '75
OR A Kondo, Harry H. '58
Curreri, John R. '43
Sarcona, Roy D. '68
NY H Greenfield, George '51
Kern, Frank J. '70
Papoulas, George P. '48
Prager, Jay M. '68
NY Θ Baldwin, Alan R. '70
Franz, John W. '70
Gorski, Gerald E. '82
Wells, Eugene F. '50
Zurla, Colleen Ann '83
NY I Drogin, Barry J. '83
Levy, Rami C. '92
Liberatore, Federico '85
Siegel, Arnold B. '81
NY Λ Gross, Ph.D., Joseph F. '53
Novakoff, Alan K. '74
NY M Griggs, Francis E. '56
NY N Brady, Dennis Patrick '02
Greenzweig, Daniel G. '82
May, Kenneth R. '78
Riebling, Robert W. '60
Sheriff, Jawaad Fuad '05
NY Ξ Drewitz, Edwin W. '77
Short, P.E., Rosemarie '91
Taylor, Maryanne B. '80
Zipf, Peter J. '79
NY P Cortina, Thomas J. '87
Lau, Soon '85
Schiavone, John M. J. '79
NC A Baldwin, Bruce Richard '92
Pitts Jr., Robert M. '78
Starr, Hygie I. '88
ND A Heltemes, Robert B. '52
Wright, Jerry A. '67
OH A Bacevice Jr., Anthony E. '70
Fakult, Joseph Paul '90
Place, David E. '69
Quigg, Joann M. '94
Sheldahl Jr., John O. '57
OR B Joanis III, P.E., Marvin A. '96
Sutton, Carolyn Ann '08
PA A Conrad, Joseph D. '53
Groff, Ronald P. '62
Shah, Minesh Ashok '90
Vogel, Stephen M. '61
PA B Bova, Francesco Antonio '05
Mathason, Brian Keith '92
Rockwell, Wayne S. '49
PA Γ Barto, Larry D. '73
Chong, Jike '01
Frison, Bradley J. '82
PA Δ Chun, Ping Sun '62
Fishstein, Bruce L. '83
Williams, Zachary James '06
Yaccarino, Robert G. '85
PA E Baum, Robert S. '37
Cross, David W. '67
Johnson, Daniel E. '65
PA Z Andrichak, Christopher S. '95
Bobowski, Bartlomiej '98
Brecht, Howard E. '63
Fanelle, John D. '81
Georges, George C. '63
Marks, Maury I. '57
Talecki, Stephen A. '76
PA H Fruci, Natale A. '55
PA Θ Spurgeon, William F. '83
PA K Potthoff, Robert E. '56
PA Λ Hays, James C. '73
Kvitkovich, James F. '81
PR A De Jesus, Tommy '00
Lebron, Jose A. '77
Perez, Luis A. '88
Rodriguez Arce, Enrique '98
Santana, Juan Carlos '97
RI A Thomas, Charles W. '49
RI B Coulters Jr., Daniel F. '60
Knickle, Harold N. '62
Nardone, Steven C. '72
Pavia Jr., Robert J. '92
SC A Jensen, Charles Brian '84
SC B Hidlay, Charlene M. '96
SC Γ Abbott, Byron A. '68
Bolden, Michael Vincent '97
Edge, Charles F. '55
Evans Jr., Samuel Godfrey '53
Wall, John Furman '56
Wysockey, Thomas J. '53
SD A Beck, Carl W. '83
Keller, Debra S. '78
Pirner, Steven Mark '72
SD B Hanson, John M. '53
TN A Dewitt, Bill F. '59
Dye, Giles S. '61
Harper, James R. '63
Scott, Bobby G. '59
Sharp, Jason Wayne '02
White, Robert S. '48
TN B Hawkins, Kenneth E. '88
Spurgeon, Susan P. '65
Vaughen, Bruce K. '88
TN Γ Adams, John A. '63
Barnett, William E. '56
TN Δ Peterson, Ralph C. '51
TN E Crenshaw, Mark A. '88
TN Z Carney, Terrance Magoun '56
TX A Andrew, Stephen '82
Dechman, Don A. '57
Floyd, F. Mike '63
Harrison, Steven Manley '97
Kumpf, David K. '70
McMullen, Hugh W. '52
Musler, Jeffrey Lynn '90
† Schmidt, Robert Lee '54
Shields, P.E., David Ray '00
Tedeschi, William J. '84
Vaughan Jr., Loren H. '54
TX B Kiesling, Ernst W. '55
TX Γ Jean, Eric Nelson '05
Kilgore III, Hardee C. '62
Kohler Jr., Arthur D. '58
Lucky, Mannie Charles '48
Miller, Myrl J. '60
TX Δ Blaschke, Byron C. '60
Crews, James A. '58
Fly, Melton L. '56
Gerlich, Leon H. '54
Hartman, Daniel B. '78
Johnson, USA Ret., Vance C. '78
Jordan, Kirk G. '80
Lippman, Glenn E. '52
McMullan, Charles D. '58
Scott Jr., Charles M. '53
Wallace Jr., Barton B. '48
TX E Damoff, Howard A. '84
Dockal, Ronald J. '73
TX Z Dunn, Joseph L. '62
† Kirkland, Robert A. '71
TX H Bouquillon, Brian Dean '01
Farmer, Eddie D. '75
Hightower, Janice M. '67
Le, Anhnguyet Thi '90
Rinewalt, J. Richard '69
Sanampudi, Padmavathi V. '95
TX Θ Karlsruher, John C. '77
Pearsall, Katherine J. '71
TX K Savoy, Demond Britt '96
TX Λ Carrier, Robert Bruce '81
UT A Birk, Jack N. '47
Call, Rey L. '50
Ellsworth, Richard D. '48
Forbes, Charles R. '49
VT A Wilson, Adam Bertrand '89
VT B Abbott, Walter H. '53
VA A Cosby, James G. '61
Jacobs, Susan '85
Mac Glashan, Donald W. '57
Miller, Lloyd F. '43
VA B Collie, Joseph H. '50
Haight, Roger Q. '82
Snavely, Charles Goble '78
Sockell, Edward J. '78
Thiel, Stephen W. '81
Tluchak Jr., Charles J. '61
VA Δ Weidner, Geoffrey Robert '96
WA A Bubar, Carol B. '87
Coombs, Gregory A. '77
Meyer, Allen L. '50
WA B Blegen, Bradley W. '67
Galligan, William L. '52
Green, Charles R. '69
Nelson, Sandy H. '49
Owens, William L. '53
WA Γ Renneberg, Daniel Frederick '82
WV A Fisher, Ervin C. '68
Mallare, Ronald A. '74
WI A Detjen, Edson R. '46
Finken, Warren E. '48
Flakas, Gerald K. '66
Wiedman, Ronald E. '52
WI B Black, Jennifer A. '01
Hauser, Eric D. '77
Searing, Lawrence G. '73
WI Γ Griffin, Michael M. '93
WY A Muchmore, Royce A. '93

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AL A Jones, Edwin E. '75
Kelley, Benjamin Clarke '08
AL B Lamar, John E. '62
McKenzie, Andrew William '02
Robinson, Tracy R. '56
Thompson, Donald L. '65
Willoughby, William M. '76
Winters, Leo H. '43
AL Γ Holladay, Phillip Linn '92
Nichols, Gary G. '78
AL Δ Sharp, Gary Allen '93
Stephens, Damon E. '11
AL E Rahman, Arifur '55
AK A Darrow, Margaret Marie '02
AZ A Buechler, Dale N. '84
Dummeyer, David M. '84
Johnston, Kyle Andrew '11
Pratt, Roger D. '67
AZ B Clemmens, Albert J. '75
Edwards, Joy Marsalla '12
Gant, Kenneth R. '85
Hooton, Thomas R. '62
Lee, William H. '04
Leftwich, M.D., Russell B. '74
Stewart, Richard James '92
Wong, Walter O. '71
AZ Γ Negrelli, Charles E. '84
AR A Broadaway Jr., Vance L. '58
Chastain, J. Dee '59
Moser, Murray C. '72
Russum, Leonard W. '39
Troillett, Ronald J. '88
Wiles Jr., Ralph A. '09
CA A Airoldi, Alan J. '58
McManus, Robert A. '77
Oldenkamp, John L. '48
Polder, Jacob H. '50
Sandrini, Louis '64
Wade, Wallace O. '62
Wykoff, Walter R. '42
CA B Alekseyev, Viktor Yuryevich '00
Almassy, William T. '71
Dixon, David A. '71
Ketefian, Gerard '94
CA Γ Bravman, John C. '79
Conti, Walter '81
Dow, Andrew Kevin '09
Ries, Carol '73
Shen, Caroline Elaine '12
Stewart, Ph.D., John L. '48
Viegas, John R. '58
Wright, P.E., Wendelin Jane '98
CA Δ Klein, Jerry A. '61
MacNeal, Paul D. '79
Meredith, Scott Michael '09
Thompson, Serena Kainoa Au '02
White, Christopher C. '95
CA E Caldwell, Roger R. '58
Durand, Helen Elaine '11
Georgeson, Duane L. '57
Green, Robert C. '53
Krikorian, Kapriel D. '70
Lam, Khanh '92
CA Z Frederiksen, Ben Joseph '11
Levy, Philippe F. '87
Maino Jr., Lismore Thomas '60
O'Rourke, Thomas F. '61
CA H Holt, Harry F. '04
Khalili, Ph.D., Azita M. '83
Laptalo, Branden Lewis '12
Nonaka, John I. '66
Siu, Nathan '12
Tang, Jimmy '07
CA Θ Donaldson, Graeme Andrew '12
Heiskell, Jon M. '65
Knox, David J. '78
Ta, Kevin K. '10
CA I Blum, John P. '90
Khoo, Tiak Oon '89
McBride, Donald G. '61
Streit, Dwight C. '80
CA Λ Cousins, Michael D. '66
Jensen, Mark Christopher '93
CA M Empey, Daniel M. '82
Hume, Curtis S. '80
Miliauskas, Richard E. '74
Mooney, Dale W. '77
Riddiough, Todd N. '96
CA N Davis, Gary M. '02
Hoevel, Marilyn K. R. '77
Huff, William J. '80
Mestemacher, Frank Charles '08
Osborne, Anthony V. '82
Pelayo, Victor '02
CA Ξ Allen, R. Gregory '92
De Leon, Alexander Basobas '10
Edalatdju, Nasila '92
CA O De La Cruz, Lasalette A. '86
Dennis, Walter J. '64
Lee, Daven Kuan Wai '05
Llanos, Nicolas '10
CA Π Moran, H. Dana '60
Wright, John H. '60
CA P McPherson, Glenn A. '79
Ramirez Jr., Jose Juan '05
CA Y Aine, Craig Randal '90
Ancheta, Cesar M. '87
Eke, Kechy N. '02
Quach, Frankie '11
Sanchez, Randall Sean '12
Thao, Cha '94
CA Φ Basha, Elizabeth Ann '03
Nokes, Jennifer Marie '94
CA X Tanigawa, Shayne Kaori '95
CA Ψ Rebert, Christopher Vaughn '12
CA Ω Best, Robert Edward '10
Hindiyeh, Rami Yusef '06
Ward, John Lee '00
CA AA Flatt, Catherine Jean '05
CA AΓ Fernandez, Matthew Go '07
CA AA Koyano, Kikuye Erin '13
CO A Cadle, Richard A. '72
Drennon, Clarence B. '58
Grandey, Gerald W. '68
Melvan, Joseph J. '76
Oakley, Jilene Marie '11
Smith, Steven D. '80
CO B Brown, Charles D. '56
Ellis, Donald G. '62
Johnson Jr., Robert B. '40
Mosgovoy, Walter V. '59
Schlak, Gerard A. '62
Thayer, Gordon David '57
CO Γ Cottrell, Donald E. '51
Hall, James C. '62
CO Δ Gonzalez, Julio Jorge '91
CO E Brock, Vernon Lyle '91
Hildebrand, Ph.D., Diane M. '12
CO Z Doskocz, Edward K. '83
Edmonston, Michael Andrew '00
Parks, Adam Kristofer '07
Wood, Charles Wade '76
CT A Goldenkoff, Ralph J. '49
Malm, Duane S. '54
CT B Grimaldi, Albert H. '60
Schwegler, Brian Charles '96
Skinner, Robert '59
CT Γ Friedman, Edward Louis '62
Yavuzturk, C. Cy '88
DE A Konchar, Janelle Amy '06
Mahan, Larry G. '82
Seitzer, Kenneth E. '78
DC A Chuku, Adanne N. '99
Dugger, W. Emmanuel '82
Ricketts-Greene, Janique M. '01
DC B Bonuccelli, Hugo A. '73
Moeller, Mitchell Glen '85
DC Γ Whitham, Charles Lamont '61
FL A Barnes, Heidi Faigle '85
Cunningham, Timothy Brian '78
Ferslew, Matthew Ryan '05
Holsonback, James L. '66
James, John L. '66
Shamblin, G. Richard '72
FL B Mere, Manuel H. '66
Prada, Jaime O. '70
FL Γ Arriola, Bruno J. '08
Covert Jr., Samuel W. '73
Hovjacky, Steven John '95
Kaw, Autar Krishen '81
Kimpland, David R. '84
Rothrock, William R. '86
FL Δ Berkowitz, Phillip Elliott '07
Tant, Deborah Ann '92
FL E Catanese, Anthony James '63
Nelson, Joshua Kath '08
FL Z Crowe, Jeremy McCandless '07
Durgin, Timothy John '11
FL H Nance, Craig E. '91
Smith, R. Joseph '04
FL Θ Erwin, James William '06
GA A Ecker, Harry A. '57
Ethridge, Noel H. '48
Flegal, William M. '66
Gebhart, Wilford W. '67
Houser Jr., Marion E. '54
Parker, Elton L. '47
Simpson, Philip B. '85
Williams Jr., Lewis W. '50
GA B Palmer, Jennifer W. '07
IL A Beierwaltes, Andrew Michael '12
Cangellaris, Ph.D., Andreas '81
Elliott, Norman J. '49
Herbeck, Allen E. '56
Kilmer, P.E., Tina E. '81
Langman, Charles Henry '70
Lindstrom, Richard R. '75
Moderwell, Nathan A. '12
Rudolph, James G. '55
Sipowich, Robert W. '56
Takarada, Julia '82
Witkowski, Larry C. '79
IL B Bass, Sidney '55
Divine, Larry J. '72
Dygdon, John T. '50
Epstein, David R. '74
Hinman, Clyde D. '49
Parks, Robert Franz '88
Rao, Prashant Sadananda '94
Townley, Michael James '10
IL Γ Whitehead, David Charles '12
IL Δ McLachlan, Christopher R. '96
Plouzek, John M. '86
IL E Whitfield, Toni Danyelle '10
IL Z Cekander, Ryan Michael '03
IN A Anders, James L. '72
Beuchel, Patrick T. '81
† Blaschke, Theodore C. '54
Brennan Jr., Paul John '46
Brumund, William F. '64
Flory, Lloyd E. '67
Gkritza, Ph.D., Konstantina '06
Hammond, Joel C. '83
Hauger, Gregory L. '78
Horton, James A. '71
Hunt, John T. '49
Jones Jr., Raymond J. '69
Kenny, Michael D. '63
Linder, Frank W. '66
Linquist, Roger D. '61
Morris Jr., Thomas A. '51
O'Connell, Patrick Shane '76
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Peters, Norman K. '45
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This is good news for anyone contemplating making a major gift to TBΠ or another charity. Under the American Taxpayer Relief Act of 2012, any donor age 70½ or older may contribute up to $100,000 annually from an IRA account and avoid federal-tax consequences. The charitable gift amount will count against the donor's required minimum distribution (RMD).

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For more information about how to help TBΠ, please call Pat McDaniel, Director of Development, at 800/828-2382 or visit *www.tbp.org/giving.cfm*.

You should always consult a tax professional if you are thinking about making a major charitable gift or a gift under the new law.

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BHP Billiton
The Blount Foundation
The BOC Group Inc.
The Boeing Company
Boston Scientific Corporation
BP Foundation Inc.
Bristol-Meyers Squibb Foundation
Buckeye Pipe Line Co.
C.I.T. Financial Corporation
Callaway Golf Company
Carolina Power & Light Co.
Centerpulse Orthopedics Inc.
CertainTeed Corporation Foundation
Champion International Corp.
Charles S. Mott Foundation
Chemical Bank
Chevron *
Ciba Corning Diagnostics Corp.
CIENA Communications Inc.
Cingular
Cisco Systems Inc.
CITGO Petroleum Corporation
Citigroup Foundation
Clark Construction
The Clorox Company
The Coca-Cola Company
Cognis Corporation
Computer Associates Internatl. Inc.
Comsat Corporation
ConocoPhillips
Constellation Energy
Control Components Inc.
Cordant Technologies Inc.
Countrywide
Covidien
Cray Research Foundation
Crayola LLC
CSG Systems Inc.
Cytec Industries Inc.
David L. Babson & Company Inc.
Dell
Dignus, LLC
DirectTV
Duke Energy Foundation
Duracell USA
EG & G Chandler Engineering
El Paso Energy
Elsevier Science
Emerson Electric Company
Engineering Design & Testing Corp.
Enterprise Products Company
EOG Resources Inc.
Equistar Chemicals, LP
Ericsson Inc.
Erie Manufacturing Company
Esterline Technologies
Exelon
Expedia Inc.
Fair, Isaac and Company Inc.
Fannie Mae Foundation
FleetBoston Financial Corporation
Fluke Networks Inc.
FM Global Foundation
Freeport McMoRan Foundation
The Gap Inc.
Gartner Group
GE Foundation
Genentech
General Reinsurance Corp.
General Signal
GenRad Foundation
Goodrich Foundation
Google
Guidant Foundation
Harcourt General Inc.
Hewlett Packard
Household International
Illinois Tool Works Foundation
IMCERA Group Inc.
IMO Industries Inc.
ING Foundation
Ingersoll-Rand Company
Ingredion, Inc.
Instron Corporation
Integrity Applications Incorporated
The J.P. Morgan Chase Foundation
The James River Corp. Foundation
Jim Beam Brands Co.
Johnson Controls Foundation
Juran Institute Inc.
Kellogg Brown & Root
Kellwood Company
Kimberly-Clark Foundation Inc.
Kraft Foods
Lennox International Inc.
Leo Burnett Company Inc.
Loiederman Soltesz Associates Inc.
The Lubrizol Foundation
LyondellBasell
M.W. Kellogg Company
M/A Com Inc.
Macy's Foundation
Mallinckrodt Speciality Chemicals Co.
Markman Inc.
Massachusetts Financial Services Co.
Massachusetts Mutual Life Insurance Co.
May Department Stores
McDonald's Corporation
McGraw-Edison Company
Meadwestvaco Foundation
Metso Automation
Microsoft Corporation
MidAmerican Energy Company
The Millipore Foundation
Mobil (Retirees)
Mondelez International Foundation *
Motorola Foundation
Motorola Mobility
National Instruments
NEPERA Inc.
Network Associates
Newmont Mining Corporation
Nissan North America Inc.
Nokia Inc.
Northrup Grumman Foundation
NOVARTIS
NRG Energy Inc.
Nuevo Energy Company
Occidental Petroleum Corp.
Owens-Illinois
Pacific Enterprises
Pathfinder Global Group Inc.
Pella Rolscreen Foundation
The PepsiCo Foundation
Petrotech Inc.
The Pew Charitable Trusts
Pfizer Inc.
Pitney Bowes
Polaroid Foundation Inc.
Potash
Power & Telephone Supply Co.
Progress Energy Inc.
QUALCOMM
Quantum Chemical Corporation
R.J. Reynolds Tobacco Co. Foundation
Ralston Purina Company
RELTEC Corporation
Rexnord Foundation
Roche Colorado Corp.
Rockefeller Family & Associates
Rockefeller Financial Services Inc.
Rogers Corporation
Rolm Corporation
SPX Foundation
Saint-Gobain Corporation Foundation
Schneider Electric/Square D Foundation
Sempra Energy
Shaklee U.S. Inc.
Shell Oil Company
Siemens
Silicon Laboratories Inc.
Southern California Gas Company
Southwest Power Pool *
St. Jude Medical
Stanley Black & Decker
The Sun Microsystems Found. Inc.
TCF Foundation
Teledyne Technologies Inc.
Tellabs Operations Inc.
Texas Instruments Foundation
Thomson Reuters *
The Toro Company Giving Program *
Toyota Technical Center, USA Inc.
Transamerica Corporation
TransCanada PipeLines
Tribune Company
Turner Industries, Ltd.
Tyco
TyCom (U.S.) Inc.
UFE Inc.
Unilever U.S. Foundation Inc.
Union Pacific Corporation
United Technologies
The UPS Foundation
Verizon Foundation
Virginia Power/North Carolina Power
W.K. Kellogg Foundation
Wachovia Foundation
Washington Mutual
Waste Management Inc.
Wheelabrator Air Pollution Control Inc.
Williams
Wisconsin Energy Corp. Found. Inc.
WRC Inc.
Xcel Energy Foundation
XE Corporation
Xerox Foundation
Xilinx
Yarway Corporation
Zeon Chemicals L.P.

Executive Director's Report

By: **Curtis D. Gomulinski**, *Michigan Epsilon '01*

SECRETARY'S REPORT

Association Officials gather around the Colorado Zeta Bent monument during a tour of the U.S. Air Force Academy following the June officials meeting in Colorado Springs.

OVERALL, the year 2012-13 exceeded expectations in nearly every respect, and the gain on investments in the trust returned to the black. Support by alumni through volunteer efforts, bequests, and annual contributions was excellent, while corporate and university financial support of the Convention and THE BENT remained high. The process to transition to electronic membership catalog cards and digitize the 535,000 existing paper catalog cards was completed. The website received a new look and over 4,000 members joined the Tau Beta Pi LinkedIn group. Alumni interest in maintaining a relationship or reconnecting with the Association continued to increase with over 750 members attending 37 alumni events. The position of Director of Alumni Affairs was revived after a 35 year absence to support alumni and the Alumni Chapters.

CHAPTERS

The 2012 Convention granted charters to Penn State Erie, The Behrend College, formally established as Pennsylvania Mu on January 26, 2013; The College of New Jersey, formally established as New Jersey Zeta on March 2, 2013; and St. Louis University, formally established as Missouri Epsilon on March 23, 2013. Articles about the installations were published in the Summer 2013 issue of THE BENT.

An inspection committee visited The University of Texas-Pan American last winter, and a petition from this school will be considered by the 2013 Convention. Two petitions for new chapters were received, and inspection teams will visit the local societies at Indiana University-Purdue University Indianapolis and Embry-Riddle Aeronautical University-Prescott this fall.

Five Alumni Chapters were chartered: Ann Arbor Area, Atlanta, Boston, Central Jersey, and Treasure Valley (Boise). Eight chapters were reactivated: Baltimore, Central Connecticut, New York City, St. Louis, New York City, Schenectady (renamed to New York Capital District), Southern California, Southern Tier (Binghamton, NY), Tampa, and West Palm Beach (renamed to Palm Beach/Broward). The Central Illinois Chapter went inactive; 31 of 65 alumni chapters are active.

A total of 223 chapters (215 in 2012) completed annual surveys that listed approximately 1,162 projects. A report on the contents of the survey will be published in the November 2013 issue of THE BULLETIN.

MEMBERSHIP

The chapters initiated 9,207 members in 2012-13, down 0.1% and the second highest total in 17 years. This included 8,815 undergraduates, 229 graduate students, 88 alumni, and 75 eminent engineers. Tau Beta Pi's initiated membership on July 31, 2013, was 544,834, and an estimated 60,000 are deceased.

During the year, about 36,400 engineering students in the 241 ΤΒΠ chapter schools were scholastically eligible for membership in the top fifth of their senior or the top eighth of their junior classes. About 38.8% of these were members of ΤΒΠ at the close of the year—the same as last year. About 1.2% were not initiated, chiefly because of their chapters' failure to hold spring ceremonies. The remaining 60% indicated a lack of interest in membership, up from 57% last year.

Tau Beta Pi chapter schools graduate about 93% of all B.S. engineers at 400 schools with ABET EAC-accredited programs and the other two schools without EAC-accreditation.

Thirty-seven chapters held only one election and initiation of new members, but all others held two or more. Six chapters held initiations without approval. No members resigned during the year, and none was expelled.

CONVENTION

The 107th Convention was held in October 2012 in Lexington with Kentucky Alpha as host. The meeting was fully reported in the Winter 2013 issue of THE BENT and the December 2012 issue of THE BULLETIN. The 2013 Convention will be hosted by the Iowa Alpha Chapter in Ames. The 2014 Convention will be hosted by Washington Delta in Spokane.

The 2012 Convention approved fifteen packages of amendments to the Constitution and Bylaws of the Association, which were ratified by the chapters and reported in the Winter 2013 issue of THE BENT; left the reimbursement schedule for the 2013 Convention the same as the 2012 Convention; made recommendations regarding the Association's website; recommended acceptance of the invitation from Massachusetts Alpha, Delta, and Epsilon and Rhode Island Alpha and Beta to host the 2015 Convention in Providence; recommended enhancements to the "Implementation Process" for the MindSET Program; reviewed

member benefits, image, and insignia of the Association and made recommendations to improve each; adopted a three-year trial process to increase the number of Convention bids; granted one curriculum appeal; and recommended the 2013 Convention study the cost of publishing THE BENT.

ASSOCIATION OFFICIALS

The TBΠ Executive Council, elected for the 2006-10 term and re-elected by the Convention for the 2010-14 term, comprises President L.A. Simonson, Ph.D., P.E., Vice President S.C. Dao, P.E., and Councillors J.F.K. Earle, Ph.D., P.E., J.A. Huggins, P.E., and N. Pih. Council meetings were held on Aug. 4, Sep. 30, Oct. 17, Nov. 14, and Dec. 8, 2012, and Jan. 16, Feb. 20, Mar. 20, Apr. 13, May 14, June 7-8, and July 30, 2013.

Tau Beta Pi has four appointed Directors with responsibilities in major areas of its interest: E.J. D'Avignon as Director of Rituals, T.E. Gomulinski as Director of Alumni Affairs, R.W. Pierce as Director of Engineering Futures, and D.S. Pierre Jr., P.E. as Director of Fellowships. Members of the Fellowship Board include C.W. Caldwell, Ph.D., D.W. Donahue, Ph.D., S.L.R. Holl, Ph.D., and J.L.H. Jamieson. The Trust Advisory Committee, which directs investment activities of the corporate trustee, includes R.F. Smith (chair), H.W. Lange, and J.W. Johnson Jr.

District Directors on July 31 were:

District 1	Lynn B. Farrington
	Selden J. Houghton
	Matthew V. Paragano
	Lauren J. Swett
District 2	Anthony M. Olenik
	Thomas A. Pinkham IV
	Jason Rogan
	George Youssef
District 3	Edward P. Gorzkowski III
	Christopher C. McComb
	Alexander J. Rovnan
District 4	Joseph P. Blackford
	Lisa C. Gascoigne
	Russell L. Werneth
District 5	Josuan Hilerio-Sanchez
	Rebecca A. Holcomb
	Elizabeth A. Stephan
District 6	Andrea M. Ramsey
	Dee Anne Stirm
	Ellen S. Styles
District 7	Ellie R. Armstrong
	David E. Dale
	Andrew J. Flowerday
	Wesley R. Repke
District 8	Bruce A. DeVantier
	Stacey L. Forkner
	Ricardo K. Komai
District 9	Brenda A. Kramer
District 10	Brian R. Buisson
	Daniel A. Kamat
District 11	Christina M. Harrison
	James C. Hill
District 12	Christopher F. Benson
	George K. Miyata
	Gregory M. Newcomb
District 13	Jeffrey G. Dabling
	Matthew T. Pittard
District 14	Timothy M. Edgar
	Ian J. Frank
District 15	Joseph R. Burnett
	Scott E. Fable
	Kimberly Stillmaker
District 16	Neal T. Bussett
	Jason A. Corl
	Scott V. Eckersall
	Stacey H. Ross

The International Headquarters staff, which is located on the Knoxville campus of the University of Tennessee, includes Executive Director C.D. Gomulinski, Assistant Secretary-Treasurer R.E. Hawks, Director of Development P.B. McDaniel, and eight additional employees (see *tbp.org*).

CHAPTER AWARDS

Tau Beta Pi's top chapter prize, the R.C. Matthews Outstanding Chapter Award, was given to Florida Alpha for the excellence of its total program in 2012-13. Honorable mentions went to Alabama Epsilon and Michigan Kappa. The R.H. Nagel Most Improved Chapter Award went to Kentucky Gamma; honorable mentions were given to Michigan Kappa and Georgia Alpha. The J.D. Froula Most Improved Membership Award went to Illinois Epsilon; an honorable mention was given to Massachusetts Zeta.

The Headquarters staff gave 33 Secretary's Commendations to chapters for the perfection of their reports to TBΠ in 2012-13, 26 Chapter Project Awards for ingenuity and creativity in activities, and 50 Membership Awards for increasing the number of students initiated into TBΠ.

MEMBER AWARDS

The 2013 Outstanding Advisor was selected by a committee of engineering deans: M.S. Ingber Ph.D. (chair), J.W Steadman, Ph.D, P.E., and S.L. Woods, Ph.D. The recipient of a $1,000 cash award and an equal sum to be presented to his dean's discretionary fund is Bruce L. Walcott, Ph.D., *IN A '81*, Kentucky Alpha Chief Advisor. *[See page 11.]*

The alumnus recognition selection committee consists of three District Directors: D.A. Stirm (chair), M.T. Pittard, and S.L. Forkner. They were charged with selecting the recipients of the TBΠ-McDonald Mentor Award and the Distinguished Alumnus Award. The 2013 Distinguished Alumnus Award will be presented posthumously to M. Lucius Walker Jr., Ph.D., P.E., *DC A '57*, and the 2013 TBΠ-McDonald Mentor will be presented to Donald W. Rhymer, Ph.D., *CO Z '94*. *[See pages 12-13.]*

The 2013 Laureates were selected by a committee of three District Directors: L.C. Gascoigne (chair), B.A. DeVantier, and E.S. Styles. They chose five Laureates from 15 nominees made by 13 chapters. *[See page 14.]*

During the year, the Executive Council gave 12 Resolutions of Appreciation, 4 Superior Service Awards, and 1 Distinguished Service Award to collegiate chapter advisors and Association Officials for long and outstanding service.

DISTRICT PROGRAM

Sixteen Districts held at least one conference last year and conducted meetings during the 2012 Convention, and Directors visited many chapters during the year. The Directors and the Council met in Colorado Springs, CO, in June 2013 and discussed means for improving regional activities and communications and planning for the upcoming year.

ENGINEERING FUTURES

The Engineering Futures Program presented a total of 231 training sessions by 42 volunteer facilitators to develop the leadership skills of student members during 2012-13. This award-winning program helps to prepare engineering students for their careers by enhancing their overall personal effectiveness through interpersonal-skills and teamwork-development seminars.

FELLOWSHIPS

The 80th fellowship group, comprising 40 students—27 with stipend, will do graduate work in 2013-14 and was announced in the Summer 2013 BENT. Fellows with stipends are paid cash grants of $10,000 each.

GRANTS

A single proposal was received for a Greater Interest in Government (GIG) grant. The proposal was declined because it did not meet the program guidelines. No requests were received for a Student Assistance grant.

MINDSET PROGRAM

The MindSET program continues to expand its reach across the country. Currently, 26 ΤΒΠ chapters are hosting hands-on activity sessions with local schools. At the close of the fiscal year, more than 1,800 elementary, middle, and high school students had participated in MindSET activity sessions. In 2012-13, 25 grants totaling $5,430 were issued to 13 chapters for MindSET projects.

SCHOLARSHIPS

The 15th group of 210 ΤΒΠ Scholars, who will complete their undergraduate engineering studies in 2013-14, are announced in this issue. *[See page 24.]* All Scholars receive a cash grant of $1,000 or $2,000 for their senior academic year. Since the program began in 1999, Tau Beta Pi has given and committed $3,307,000 to 1,412 students.

In the ΤΒΠ Chapter Performance Scholarship Program, $7,500 in scholarships were available to students selected by 15 chapters.

Six $1,000 scholarships for the first year of college study in 2013-14 for incoming freshman engineering students were provided by the Society (for a 15-year total of 95) through the national program conducted by the Society of Automotive Engineers.

CONTRIBUTIONS FROM ALUMNI

Tau Beta Pi's 2012 Annual Giving Campaign brought gifts of $950,331 (up 5.0%) from 11,102 donors (up 0.8%), including 382 new donors (down 5.7%). Their names were published in the Winter and Spring 2013 issues of THE BENT. Included in the total is $35,554 allocated to the Fellowship and Scholarship Programs from 234 companies that match gifts from employees. The 2013 Giving Program began on February 1, and the response by July 31 reached $624,132 from 7,130 loyal members.

The Society was included as an eligible organization in the 2013 national Combined Federal Campaign.

The Association Officials are deeply grateful to the generous alumni whose gifts fund important programs that help our chapters and student members.

OTHER ACTIVITIES

Tau Beta Pi has maintained its affiliations with the American Association for the Advancement of Science and the Association of College Honor Societies and its association membership in the American Society for Engineering Education. The Executive Director is Tau Beta Pi's official representative to these organizations.

Tau Beta Pi operates its own web-based job board—The Best People—and maintains other valuable benefits for members. Nearly 1,400 jobs were available through The Best People on July 31.

The Association was a contributing society to National Engineers Week 2013.

Members of the Executive Council, Executive Director Gomulinski, and other Association Officials met with alumni at receptions and gatherings at 16 District Conferences and 21 other events held across the country.

Tau Beta Pi has maintained its classification under Section 501(c)(3) of the U.S. Internal Revenue Code as a tax-exempt, charitable and educational, non-private organization and is exempt from sales tax in 16 states. Collegiate chapters are separately classified under Section 501(c)(7) of the code, except Michigan Gamma, which is classified under Section 501(c)(4).

TREASURER'S REPORT

The financial condition of ΤΒΠ at the close of the fiscal year was improved because of bequests, record giving by alumni, and substantial investment capital gains. Revenue over expenses was $2,755,000. Assets increased in 2012-13 by $2,838,000 to a total of $23,747,000.

FINANCIAL POSITION STATEMENT

The several named trust funds are commingled and invested under the jurisdiction of the ΤΒΠ Trust Advisory Committee. The trustee is the trust department of the PNC Bank in Cleveland, OH. The trustee performed satisfactorily during the year.

Investment earnings of the funds, less trustee fees and including capital gains, are used for the purposes indicated by the fund titles: paying fellowship and scholarship stipends, paying for BENT magazines delivered to life subscribers, paying project grants to chapters in the MindSET and Greater Interest in Government Programs, supporting the Convention, and financing many useful activities of the collegiate chapters. Overall, net earnings of the investments, including security sales and market gains, were 20%; the previous year's figure was -6%. Paid investment earnings were $615,000; net investment market gains were $3,195,000.

Securities held by the trustee on July 31, 2013, are carried at market value of $22,227,000, an increase of 16.2% from the previous year, and comprise holdings in 14 non-overlapping, no-load mutual funds. Equity securities constituted 90% of the total trust funds.

The current liability in fellowships and scholarships is for those stipends committed in 2012-13 for payment in 2013-14 to student recipients. The 2013 Convention liability includes the assessments paid by new initiates during the year and $27,650 in gifts from corporate and university sponsors. The deferred BENT subscription liability is for both annual subscriptions and the four-year subscriptions for new members included in the Association initiation fee. The liability for delivering future magazines under four-year subscriptions is entered on the books at the time of initiation.

The decrease in BENT life subscription liability was countered by the 347 new life subscribers. Life subscription fees are recorded as a liability because of the commitment against the annual earnings of those fees to pay for copies of THE BENT to be delivered. This liability represents the total value of all life subscriptions in force on July 31, 2013, at their enrollment-fee prices, less an actuarial proportion of $1,254,000 recognized as revenue since 2004. Upon the deaths of life subscribers, their paid fees are transferred on the books to the Fellowship Fund and are reported as revenue.

The net assets of the Association decreased by $2,755,000 because of trust investment losses of $3,195,000. A subsidiary report details the changes during the year in individual funds, most of which increased because of the gain in market value.

The L.E. Record Scholarship Fund grew by $674,000, Vincent A. Stabile Scholarship Fund by $440,000, the Fellowship Fund by $321,000, the Convention Fund by $202,000, THE BENT Life Subscription Fund balance by $423,000, the Engineering Futures Fund by $55,000, and the District Program Fund grew by $73,000. The new Petitioner's Support and Delegate's Support Funds were established through the generosity of alumni supporters.

THE TAU BETA PI ASSOCIATION

STATEMENT OF FINANCIAL POSITION

On July 31, 2012 and 2013

ASSETS

Current Assets	*2013*	*2012*
Cash and cash equivalents	$ 442,562	$ 772,071
Accounts receivable		
Chapters	47,000	52,254
Student loans	22,612	17,092
BENT life subscription installments	5,335	6,130
Trust contributions	5,000	5,000
Other	16,231	16,077
Total Receivables	96,178	96,553
Inventory	43,438	20,130
Split-interest agreements, cur. portion	79,825	78,287
Prepaid expenses	37,225	22,121
Total Current Assets	699,227	989,162
Depreciable: Furniture and equipment	146,476	157,580
Less accumulated depreciation	-115,674	- 134,617
Total Depreciable	30,803	22,963
Other Assets		
Investments	22,227,432	19,122,852
Split-interest agreement, net of cur. portion	790,014	774,803
	$23,017,447	$19,897,655
TOTAL ASSETS	$23,747,477	$20,909,780

Financial statements have been audited.

LIABILITIES AND NET ASSETS

Current Liabilities	*2013*	*2012*
Accounts payable		
Chapters	$ 1,815	$ 6,131
Laureate awards	12,500	12,500
Fellowships/Scholarships	689,000	609,000
Other	42,794	12,520
Accrued expenses	42,526	30,165
Annuities payable, current portion	19,037	19,037
Deferred Convention revenue	92,092	94,810
Deferred BENT revenue, current	63,783	63,783
Total Current Liabilities	967,638	847,946
Annuities payable, net of cur. portion	106,144	111,687
Deferred BENT subscription revenue	80,946	78,849
THE BENT life subscriptions	1,230,775	1,263,896
Total Long-term Liabilities	1,417,866	1,454,432
TOTAL LIABILITIES	2,385,504	2,302,378
Net Assets		
Unrestricted:		
Undesignated	1,108,713	998,747
Designated	7,917,095	6,776,125
Temporarily restricted	6,993,357	5,526,470
Permanently restricted	5,342,809	5,306,060
TOTAL NET ASSETS	21,361,974	18,607,402
TOTAL LIABILITIES & NET ASSETS	$23,747,477	$20,909,780

STATEMENT OF ACTIVITIES

Chapter and initiation fees (shown less THE BENT subscription portion) rose by $3,000.

Overall contributions and bequests fell by $513,000. Total gifts from alumni and matching corporations in the two annual giving programs in 2012-13 amounted to $1,030,000 (up 17% from 2011-12). The Association is deeply grateful to the 10,996 members who contributed during the year.

Convention revenue consists of assessments for the 2012 Convention, $55,000 in industrial gifts, and $49,000 from alternate delegates and visitors.

BENT publication revenue fell by $3,000 due to a slight decrease in recruitment advertising; expenses fell by $68,000 due to a change in the Headquarters expense allocation. Total investment earnings and market loss on the Life Subscription Fund rose by $264,000. In 2012-13, the invested fund gained $2.04 per life copy delivered, compared with the previous year's loss of $0.51. Earnings per life copy exceeded cost by $0.91, versus last years' loss of $1.83 per copy.

The total of interest and dividends in 2012-13 increased by $142,000. The net gain on investments was $3,195,000, reflecting reported changes in market value.

The 10 major chapter programs (the first 10 under Expense) usually show an operating loss. Convention expenses rose by $40,000 and include the cost of attendance by one student delegate from each collegiate chapter, alternate delegates, alumnus delegates, chapter advisors, and visitors—but not by Association Officials.

Expenses for fellowships and scholarships rose by $100,000 because more scholarships and fellowships were given. (Revenue for these awards includes all matching gifts from corporations and alumni contributions specifically earmarked by donors.) Since the Fellowship Program was inaugurated in 1929, TBΠ has given and committed $5,700,000 in stipends to 988 Fellows and $3,007,000 to 1,426 Scholars. Fellowships and scholarships comprise the major philanthropic program of the Society—made possible by gifts from alumni, friends, and participating industrial firms.

INITIATION FEES

Tau Beta Pi's low Association initiation fee covers the cost of the official badge, membership certificate, copies of the *Constitution and Bylaws* and *Information Book*, and a four-year subscription to THE BENT. The initiation fee has been $32 since August 1, 2004. In addition, new members were charged an assessment of $7 for partial support of the annual Convention.

STUDENT LOANS

Only five new loans were made to members in 2012-13 for a total of $9,700. None were for the amount of TBΠ's initiation fee. One loan was repaid, none were written off during the year, leaving ten outstanding on July 31, 2013, with a principal balance of $22,600. Since inauguration in 1932 of the program, 1,789 loans have been made to student members for a total of $872,375.

EDITOR'S REPORT

THE BENT

During 2012-13, the four issues contained a total of 232 pages, and 395,100 copies of the magazine were available for paid subscribers. This is a 1% increase in paid copies above the previous year's circulation total. Engineering and graduate-school recruitment advertising for the year totaled 16.9 pages, a 6% increase from the previous year. Total production cost of the magazine per paid copy was $1.13, down from $1.31 the preceding year.

New BENT life subscribers added

THE TAU BETA PI ASSOCIATION

STATEMENT OF ACTIVITIES

For the years ended July 31, 2012 and 2013

REVENUE	*Unrestricted*	*Temporarily Restricted*	*Permanently Restricted*	*2013*	*2012*
Initiation and chapter fees and fines	$ 223,440			223,440	219,930
Chapter and individual sales	154,230			154,230	129,094
Contributions and bequests	1,042,378	107,250	20,000	1,169,628	1,682,466
Convention	167,809			167,809	175,662
THE BENT publication	245,686			245,686	249,051
Net life subscription fee transfer	53,554			53,554	14,667
Student loan interest	539			539	1,639
Miscellaneous/ Net gain on equipment sales	23,195			23,195	30,816
Interest and dividends	299,740	431,348		731,089	588,847
Net gain (loss) on investments	1,558,371	1,636,664		3,195,035	(1,279,219)
Change in value of split-interest agreements			16,749	16,749	59,882
Net assets released from restrictions	708,375	(708,375)	-	0	0
TOTAL REVENUE	4,477,317	1,466,887	36,749	5,980,953	1,872,834
EXPENSE					
Program services					
Chapter and initiate supplies	291,652			291,652	280,537
Cost of chapter and individual sales	135,427			135,427	104,873
Convention	491,157			491,157	458,745
Advisor Program	22,150			22,150	13,648
Alumni Program	86,256			86,256	54,779
BENT publication	446,768			446,768	514,390
BULLETIN production	17,756			17,756	17,523
District Program	251,502			251,502	270,106
Engineering Futures Program	145,605			145,605	162,714
Fellowship & Scholarship Program	778,863			778,863	679,282
Greater Interest in Government Program	4,325			4,325	4,596
K-12 MindSET Program	37,213			37,213	44,154
Laureate Program	18,608			18,608	19,932
McDonald Mentor Program	4,698			4,698	5,674
Student Assistance Program	1,790			1,790	1,883
Student Loan Program	6,699			6,699	10,725
Total program services	2,740,467			2,740,467	2,643,561
General and administrative	118,716			118,716	90,106
Alumni Giving Program	367,197	0	0	367,197	231,212
TOTAL EXPENSE	3,226,380			3,226,380	2,964,879
CHANGE IN NET ASSETS	1,250,937	1,466,887	36,749	2,754,573	(1,092,044)
Net assets, beginning of year	7,774,872	5,526,470	5,306,060	18,607,402	19,699,446
Net assets, end of year	$9,025,808	6,993,357	5,342,809	21,361,974	18,607,402

Financial statements have been audited.

during the year numbered 347 (up from 337), bringing total life subscriptions to 79,940. Of all the life subscribers enrolled since 1929 when the plan was instituted, 11,390 are deceased, and their fees totaling $336,00 have been transferred to the Fellowship Fund in accord with the Constitutional requirement.

An average of 153 copies per issue in 2012-13 was delivered to annual renewal subscribers, 35,499 copies to original four-year subscribers, and 63,129 copies to life subscribers, for a total of 98,780 paid copies per issue. The total number of paid copies for the Summer 2013 magazine was 99,022.

THE BENT carries articles on general professional topics in engineering, news about TBΠ and its members and chapters, and regular departments. The Association is indebted to the alumni who serve as judges and writers of the Brain Ticklers column: H.G. McIlvried III (chair), D.A. Dechman, J.C. Rasbold, and F.J. Tydeman.

THE BULLETIN

During 2012-13, the four issues contained a total of 51 pages, and no copies were printed. All issues are available on the website. Published chiefly for the information of the student members and the advisors of the collegiate chapters, the newsletter is a valuable means of exchanging project ideas and distributing information and instructions on chapter operations.

OTHER PUBLICATIONS, SOCIAL MEDIA, AND WEBSITE

New editions of the *Constitution and Bylaws and Eligibility Code* and the *Information Book* were printed. Other brochures and materials were updated and reprinted throughout the year.

Tau Beta Pi's presence on social media continued to increase. Over 14,000 members are part of our LinkedIn group, 2,600 people "like" Tau Beta Pi on Facebook, and over 30,000 people have read our blog with daily news. The website received a complete redesign during the year and has received over 24.4 million visits since its creation. The website contains a wealth of operational and historical information about the Society. Visit *tbp.org* to find out the latest TBΠ news!

ALUMNI AFFAIRS DIRECTOR

We have our first Director of Alumni Affairs in 35 years following the appointment of Tricia E. Gomulinski, *SD A '98*. She will be working with members interested in starting or reactivating alumni chapters, supporting current ones, organizing alumni events around the country, and serving as a resource to the District Directors. She was chosen for the volunteer position after the Executive Council appointed a committee of Vice President Solange Dao, Councillor Jason Huggins, Fellowship Board member Sue Holl, District 2 Director Tom Pinkham, and Major Gifts Officer Sherry Jennings-King to review applications and interview candidates. The office had been eliminated in 1978 following adoption of the District Program.

Tricia said following her appointment: "After serving as a District 12 Director in Colorado for twelve years, working with our collegiate chapters, and then more recently volunteering at HQ, I realized a need for improvement in our relations with alumni. Over the years, 65 alumni chapters have been chartered. Never have they existed all at the same time. Currently, we have 31 active alumni chapters. I encourage alumni to reconnect with the organization and see what our alumni chapters are doing. Visit *www.tbp.org/alumni* to view upcoming events and to find the contact of the chapter near you. Join the Tau Beta Pi Engineering Honor Society group on LinkedIn. Many events are announced there as well.

The Central Jersey chapter was recently granted a charter, and the Baltimore, St. Louis and Schenectady chapters are now reactivated (Schenectady is now New York Capital District). The Atlanta Alumni Chapter was officially installed. Other areas around the country are working to establish chapters, including Austin, Dallas, Portland (OR), Tucson, Phoenix, Charlotte, Raleigh/Durham, Huntsville, New Orleans, and Puerto Rico. If you are interested in any of these locations, please let me know and I can put you in contact with them. Out of 500,000+ members, only about 96,000 have emails on file. Send me an email at *tricia@tbp.org*, and I'll add it to your record. I frequently use email to contact members about local events rather than pay to mail. If you know other Tau Bates, encourage them to email me too. I look forward to working with our alumni chapters and to connecting with as many members as possible."

ATLANTA CHAPTER INSTALLED

The Atlanta Alumni Chapter was installed at a ceremony in the city June 25. Shown above, with their new charter are, from left, front row: Director Ileana Gonzalez, *PR Α '89*, and President Meghan Ferrall, *FL Α '12;* Back row: Director Rob McColl, *TN Β '10;* Treasurer David Ediger, *DC Γ '08;* Secretary Michael Matzke, *OH Ζ '10;* and Vice President Philip Riley, *KY Α '12*. Area alumni met at Gordon Biersch restaurant last November and successfully petitioned to charter a new chapter. If interested in joining the Atlanta Alumni, please contact President Ferrall at *tbp.atlanta.alumnus@gmail.com*. Its website is *https://sites.google.com/site/tbpatlantaalumnus/*.

•Still in Atlanta, more than 100 people attended the reception hosted by ΤΒΠ for Tau Bates and other delegates at the annual conference of the American Society for Engineering Education (ASEE). This 33rd annual gathering was held June 24 in the Omni Hotel at CNN Center. Shown below, from left, are former Executive Councillor John W. Prados, Ph.D., P.E., *TN Α '54;* Distinguished Alumnus for 2002 and former columnist for The Bent Lyle D. Feisel, Ph.D., P.E., *IA Α '61;* ASEE president Walter W. Buchanan; Angelo J. Perna, Ph.D., *NJ Γ '57*, and Edwin C. Jones Jr., Ph.D., *WV Α '55*.

ASSOCIATION VOLUNTEERS

Tau Beta Pi is pleased to welcome the following new Association Officials:

- **Christopher C. McComb,** *CA P '12*—District 3 Director
- **Josuan Hilerio-Sanchez,** *PR A '07*—District 5 Director
- **Andrea M. Ramsey,** *KY A '12*—District 6 Director
- **Christina M. Harrison,** *TN A '93*—District 11 Director
- **Yue (Luna) Yuan,** *PA E '12*—EF Facilitator
- **Vanessa A. Scagliati,** *FL Θ '09*—EF Facilitator
- **Stewart R. Baskin,** *FL E '13*—EF Facilitator
- **Wayne B. Paugh,** *FL Γ '93*—EF Facilitator

Tau Beta Pi expresses its gratitude to the following retiring volunteers:

- **Robert C. Huck,** Ph.D., *OK A '00*—District 9 Director for 8 years
- **Sherry D. Jennings-King,** *TN A '93*—Districts 11, 15 and 3 Director for a total of 19 years
- **Michael L. Peterson,** *IA A '89*—EF Facilitator for 23 years
- **Reena Singhal,** *PA Γ '00*—EF Facilitator for 10 years
- **Jason A. Corl,** *CA Θ '06*—District 16 Director for 6 years

HEADQUARTERS VISITORS

Andrew J. Flowerday, *MI I '02*, Livonia, MI; November 26, 2012.
Solange C. Dao, P.E., *FL A '95*, Orlando, FL; December 8, 2012.
Donna R.H. Riggs, P.E., *TN A '90*, Knoxville, TN; December 8, 2012.
Larry A. Simonson, Ph.D., P.E., *SD A '69*, Rapid City, SD; December 8, 2012.
Jason A. Huggins, P.E., *FL A '96*, Gulf Breeze, FL; December 8, 2012.
Richard R. Andre, C.S.P., *NY K '96*, Knoxville, TN; December 8, 2012.
Timothy D. Wheelock, *TN A '93*, Knoxville TN; December 8, 2012.
Norman Pih, *TN A '82*, Flagstaff, AZ; December 8, 2012.
Mancil W. Milligan, Ph.D., P.E., *TN A '56*, Luttrell, TN; December 8, 2012.
Michael E. Kennedy, Ph.D., *TN A '86*, Lexington, KY; December 13, 2012.
Christina M. Harrison, *TN A '93*, Maple Grove, MN; April 2, 2013.
Norman Pih, *TN A '82*, Flagstaff, AZ; April 17, 2013.
Max D. Trundle, *TN A '72*, Powell, TN; April 19, 2013.
Jane S. Hirz, *TN A '73*, Boca Raton, FL; May 14, 2013.
Richard P. King, *MS A '02*, and **Jessica R.D. King,** *MS B '03*, Huntsville, AL; June 15, 2013.
Arnold F. Hall Sr., *MD B '68*, Georgetown, MD; July 5, 2013.
Solange C. Dao, P.E., *FL A '95*, Orlando, FL; August 9, 2013.
Jonathan F.K. Earle, Ph.D., P.E., *FL A '65*, Gainesville, FL; August 9, 2013.
Jason A. Huggins, P.E., *FL A '96*, Gulf Breeze, FL; August 9, 2013.
Norman Pih, *TN A '82*, Flagstaff, AZ; August 9, 2013.
Larry A. Simonson, Ph.D., P.E., *SD A '69*, Rapid City; SD; August 9, 2013.
Amani A. Alkayyali, *MI E '14*, Detroit, MI; August 13, 2013.

VOLUNTEER RECOGNITION

Tau Beta Pi depends on many generous alumni to keep our programs and chapters running strong. We thank all of our volunteers for their time, energy, and commitment.

In particular, the Society recognizes 8 District Directors who have served the collegiate chapters for 18, 12, and 6 years as of July 31, 2013:

- **James C. Hill,** *CA Γ '62*—18 years
- **Scott E. Fable,** *CA T '96*—12 years
- **Selden J. Houghton,** *NY Θ '00*—12 years
- **Jason A. Corl,** *CA Θ '06*—6 years
- **Lynn B. Farrington,** *ME A '06*—6 years
- **Andrew J. Flowerday,** *MI I '02*—6 years
- **Stacey H. Ross,** *CA K '06*—6 years
- **Dee Anne Stirm,** *AL E '06*—6 years

Seven Engineering Futures Facilitators have served the Society for 12 and 6 years as of July 31, 2013:

- **Cheryl Cheng,** *MI Γ '00*—12 years
- **Katy L. Colbry,** *MI A '99*—12 years
- **Steven P. DeCabooter,** *MI A '94*—12 years
- **Felipe A. Leon,** *FL Θ '99*—12 years
- **Dirk J. Colbry,** *MI A '06*—6 years
- **Scott E. Fable,** *CA T '96*—6 years
- **Jeffrey A. Sawyer,** *CA T '05*—6 years

ΤΒΠ would also like to recognize the following alumna who has volunteered her time for over 25 years!

Ellen S. Styles, *AL Δ '85*, started volunteering shortly after graduation. She has served as an Assistant District 6 Director and District 6 Director since 1985—except during a four-year break from 2002-06 to serve as Tau Beta Pi Vice President. She joined the ranks of the Engineering Futures Facilitators in 2011. Ellen lives with her husband Robert, *AL Δ '76*, in Huntsville, AL, and works as a senior engineer with AI Signal Research.

Headquarters staff are available to take your calls from 7:30 a.m. to 5:00 p.m. ET, Monday through Friday. The office will be closed in observance of the following holidays:

- New Year's Day
- President's Day
- Good Friday
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving
- Friday after Thanksgiving
- Christmas Eve
- Christmas
- New Year's Eve

SPOTLIGHT

MOOC Law Put On Ice
Legislation in California originally aimed at getting state colleges to award credit for massive open online courses and other offerings from non-university providers has been shelved for at least a year.

The Chronicle of Higher Education reported that the bill caused a stir when it was introduced, in March, by State Sen. Darrell Steinberg, a powerful Democrat in the California Legislature.

Faculty unions strongly opposed it, and later drafts of the bill would give faculty-governance bodies more oversight of what outside courses could count for credit.

Now Steinberg has shelved the bill. The senator will re-evaluate next summer whether the legislation is still necessary. He changed his mind after the three public systems in California moved to expand their online offerings.

California State University, for example, announced that it would offer 36 online courses that could be taken for credit by students at any of the system's 23 campuses.

STEM Support For Women
All-female residence halls and mentorship programs can help women thrive in male-dominated fields, reports *US News and World Report.*

Schools such as University of Texas-Austin and Virginia Tech are using learning communities to create a sense of belonging.

These programs put new students in residence halls with more experienced female engineering students who can mentor them along the way. Women in these dorms live, study, and play together—volunteering for community service and competing on intramural sports teams.

This gives them the support system male students have had all along,

Bevlee A. Watford, Ph.D., *VA B '81,* associate dean of academic affairs at Virginia Tech's college of engineering, told the *U.S. News* STEM Solutions conference.

Patenting/Licensing Income Up
The Association of University Technology Managers has released highlights from its latest annual survey of patenting and licensing activity by colleges and other research organizations.

These showed that total income from royalties and other sources for the 194 organizations that responded to the survey was in excess of $2.6 billion for the 2012 fiscal year.

The highlights report that appears on the association's website includes information from 161 universities, plus 32 hospitals and research institutes, and one third-party technology-investment firm.

Over the past year, the report says, those respondents filed for 14,224 new U.S. patents and formed 705 start-up companies.

Graduating More Engineers
Mexico is producing graduates in engineering and technology at rates that challenge its international rivals, including its No. 1 trade partner, the U.S.

Former President Felipe Calderon said that Mexico graduates 130,000 engineers and technicians a year from universities and specialized high schools, more than Canada, Germany, or even Brazil, which has nearly twice the population of Mexico, said the *Washington Post.*

However, "it remains an open question whether the soaring number of skilled graduates will transform Mexico into the 'country of engineers' that Calderon envisions, or they go to work in low-level managerial jobs at assembly plants owned by foreigners—jobs that have come to define their profession here."

PEOPLE

Andreas C. Cangellaris, Ph.D., *Illinois Alpha '81,* the head of the department of computer and electrical engineering at the University of Illinois at Urbana-Champaign, has been chosen as the next dean of the university's college of engineering. Cangellaris is broadly recognized for research in applied and computational electromagnetics and its applications to the signal integrity of integrated electronic circuits and systems.

Teresa A. Dahlberg, Ph.D., *Pennsylvania Lambda '84,* is the new dean of the Cooper Union school of engineering. She was associate dean of the college of computing and informatics at the University of North Carolina at Charlotte. She is well known for forming strategic partnerships, having created a national organization, the STARS Computing Corps, to engage students in college programs.

John R. English, Ph.D., P.E., *Oklahoma Gamma, '88,* has been named the ninth dean of the University of Arkansas college of engineering. He was dean of the college of engineering at Kansas State University. The focus of most of English's research is on quality and reliability engineering. From 2000 to 2005, he was founding director of the Center for Excellence in Logistics and Distribution, a National Science

Foundation Industry and University Cooperative Research Center.

Albert P. Pisano, Ph.D., *New York Alpha '76,* is the next dean of the University of California, San Diego school of engineering. He was a professor at UC Berkeley, serving in a number of leadership positions at department, school and campus level, including chair of the mechanical engineering department and acting dean of Berkeley's engineering school. Pisano also served as a program manager for the Defense Advanced Research Projects Agency.

Zulma R. Toro-Ramos, Ph.D., *Kansas Beta, '82,* has become provost and vice chancellor for academic affairs at University of Arkansas at Little Rock. She was dean of the college of engineering at Wichita State University in Kansas. In addition to being dean, she was director of the Center for Innovation and Enterprise Engagement, a center promoting south central Kansas manufacturing.

John M. Wiencek, Ph.D., *Ohio Beta '84,* has become senior vice provost for administration and strategic initiatives at Virginia Commonwealth University. He was engineering dean at the University of South Florida. Wiencek has overseen a dramatic increase in external philanthropic funding for the college, which rose from just $700,000 in 2007 to a high of $39 million in 2011.

FACILITIES

Cornell University's technology campus in New York City will have an innovation institute as a result of a $133 million donation by Qualcomm Inc. co-founder **Irwin M. Jacobs,** Sc.D., *NY Δ '56,* and his wife Joan.

The gift will support curriculum initiatives, faculty and graduate students in a two-year master's program at the campus, under development by Cornell and Technion-Israel Institute of Technology. The first students began in January at a temporary facility as the groundbreaking for the Roosevelt Island campus takes place next year.

Cornell, based in Ithaca, New York, and Haifa-based Technion won a contest to build the campus with a land grant and $100 million for infrastructure improvements.

Georgia Institute of Technology will offer a three-year master's degree in computer science that can be earned entirely online—and that will cost less than $7,000, reports *Time.*

The school is partnering with Udacity, a for-profit provider of MOOC (massive open online course) education, and AT&T, which is contributing $2 million and will provide connectivity tools and services.

Time reported: "Online education has a reputation—some would argue a self-inflicted one—as an inferior substitute for brick-and-mortar scholarship." But "Georgia Tech is a good candidate to pioneer an online degree program that could challenge those assumptions about online education, experts say. Its academic bona fides—#5 ranking on *US News & World Report's* list of top graduate engineering programs—give the initiative credibility."

Wayne State University has celebrated the groundbreaking of its new Advanced Technology Education Center (ATEC) in Warren, MI. The 40,000-square-foot facility will offer students from Macomb County and surrounding areas the opportunity to attain four-year degrees in high-demand academic programs such as engineering, computer science, business, and advanced manufacturing, and provide collaborative opportunities with area businesses.

The project involves the renovation of an existing structure on the 3.5-acre site. The total estimated cost of the ATEC facility is $12 million, and it will be open for classes in fall of 2014.

Brown University is receiving $35 million from technology investors Theresia Gouw and **Charles H. Giancarlo,** *RI A '79,* to help fund a building for its engineering school. The school is also receiving $9 million from donors who wish to remain anonymous.

Brown plans to improve and expand its engineering facilities on its main campus in Providence, RI, including adding 15 faculty members, renovating, and adding teaching and research space, and other projects.

The university is seeking to raise a total of $160 million over the next few years to expand its engineering program. Gouw is a managing partner at Accel Partners.

Giancarlo is managing director of the equity firm Silver Lake Partners and formerly executive vice president and chief development officer of Cisco.

University of Denver has announced a new interdisciplinary STEM initiative, including preparing globally competitive graduates for business and entrepreneurship.

The university will construct a new engineering and computer science building that will bring together multiple complementary STEM activities and research already taking place on campus. The building is made possible by three gifts totaling $40 million.

Brain Ticklers

RESULTS FROM SPRING

Perfect

*Anderson, Paul M.	Son of member		
*Gerken, Gary M.	CA	H	'11
*Gibbs, Kenneth P.	MO	Γ	'76
Norris, Thomas G.	OK	A	'56
Prince, Lawrence R.	CT	B	'91
*Schmidt, V. Hugo	WA	B	'51
*Thaller, David B.	MA	B	'93

Other

Aron, Gert	IA	B	'58
Beaudet, Paul R.	Father of member		
Bohdan, Timothy E.	IN	Γ	'85
Buckley, Robert C.	TN	Z	'12
*Couillard, J. Gregory	IL	A	'89
Grant, Chuck	Non-member		
Chance, Sophie	Non-member		
Grewal, Rashi	NJ	Γ	'09
Handley, Vernon K.	GA	A	'86
Jones, Donlan F.	CA	Z	'52
Kimmel, Peter G.	Husband of member		
McCormick, Reynard	Non-member		
Rentz, Peter E.	IN	A	'55
Richards, John R.	NJ	B	'76
Riedesel, Jeremy M.	OH	B	'96
Smith, Evan	Son of member		
Smith, Josh	Son of member		
*Spong, Robert N.	UT	A	'58
*Stribling, Jeffrey R.	CA	A	'92
*Strong, Michael D.	PA	A	'84
Summerfield, Steven L.	MO	Γ	'85
Sutor, David C.	Son of member		
Teale, John L.	NM	B	'76
Voellinger, Edward J.	Non-member		
Young, Daniel R.	OH	A	'12

*Denotes correct bonus solution

SPRING REVIEW

Problems 3 (wafers) and 4 (paths) were the hardest regular problems, with only about 50% correct answers. The Bonus (ages) had a six part answer. Many responders got some of the answer correct, but only 40% got all six parts correct.

SUMMER SOLUTIONS

1 From premises 5 and 6, we can conclude that Christopf L. Biggleswade is **fluent in Klingon**, because he is a hippy. Using premise 2, we learn that Christopf is **unhappy**, because all hippies are unhappy. From premise 8, Christopf is **not a Ph.D. candidate** because he is unhappy. Premise 7 allows us to conclude that Christopf's **Mom is, or has been, a shaman** because he is fluent in Klingon but is not a Ph.D. candidate. Premises 4 and 1 tell us that Christopf has **shingles** because he works at the Reliable Data Dump. Finally, using premise 3, Christopf **does not suffer from mixed dominance** because his mother is, or has been, a shaman and he suffers from shingles.

2 It takes **seven** pours to divide the eight pints in the jug into two equal parts. The state space is small enough to explore all unique alternatives in the decision tree.

	8-pint	5-pint	3-pint
initial state	8	0	0
pour #1, 8 into 5 →	3	5	0
pour #2, 5 into 3 →	3	2	3
pour #3, 3 into 8 →	6	2	0
pour #4, 5 into 3 →	6	0	2
pour #5, 8 into 5 →	1	5	2
pour #6, 5 into 3 →	1	4	3
pour #7, 3 into 8 →	4	4	0

3 The final league table is:

	P	W	L	D	GF	GA
A	3	1	1	1	6	5
B	3	3	0	0	4	1
C	3	0	1	2	3	4
D	3	0	2	1	0	3

B defeats A 2-1, defeats C 1-0 and defeats D 1-0. A defeats D 2-0, draws with C 3-3. C draws with D 0-0.

B won all 3 games, with only 4 goals, so 2 of its games were 1-0, and they scored 2 goals in their third. D scored no goals, and drew one game, which must have been 0-0, with either A or C. D must have lost the other two games by scores of 0-1 and 0-2. A conceded 3 goals in their draw with C, and none to D, so B must have scored 2 goals against A. Therefore, B must have beat C 1-0 and D 1-0. A, which is known to have scored at least 6 goals, put in 3 against C, and no more than one against B, so must have scored a minimum of 2 against D. We conclude that A beat D 2-0, scored once in their loss to B, and that D drew with C 0-0.

4 The smallest set of 10 consecutive primes in arithmetic progression (for N=0 to 9) is produced by: **199 + 210N**. Number theory tells us that the difference between consecutive terms in an arithmetic sequence of primes is the product of the prime numbers that are less than the required number of terms in the sequence. This can be observed by inspecting the first few sets of M consecutive primes:

Terms	Formula	Primes
3	3+ 2*N*	3, 5, 7
5	5+ 6*N*	5, 11, 17, 23, 29
6	7+30*N*	7, 37, 67, 97, 127, 157

For the above three sequences of length 3, 5, and 6, the difference between terms is 2, 2x3=6 and 2x3x5=30 respectively. Since we asked for 10 primes in the arithmetic progression, the difference must be a multiple of 2x3x5x7=210. Using a table of primes or a spreadsheet, it is not too hard to find that the first term is 199.

5 BEAVER + TIGER = RABBIT is **251453 + 60753 = 312206**. From the leading digits, R=B+1, and from the least significant, T = 2R (mod 10). From these two equations, B cannot be 0, 4 (that would imply T=0), 8 (causing a conflict with T at 8) or 9 (which implies R=0). This leaves six possible (B,R,T) triples: (1,2,3), (2,3,6), (3,4,8), (5,6,2), (6,7,4) and (7,8,6). To determine potential E values, observe that E+T >= 9 to provide a carry to the most significant digit. Fixing E implies I, because I=(2E)+(carry of 2R). Considering all possible E values, eliminate E that forces conflicts with E or I. Finally, observe that A=B-I or A=B-I-1 and E+T=A or E+T+1=A. This leaves only one possibility for (B,R,T,E,I,A)=(2,3,6,5,0,1). Pick V and G from the remaining digits such that (V+G+1) mod 10=B or V+G=11. V and G must be 4 and 7, so we pick G=7 for the largest TIGER.

Bonus This problem is known as Tower of Hanoi with cyclic moves only. Let f(n) be the number of moves to move an n-stack one peg, and g(n) be the number of moves to move an n-stack two pegs. Then,

to move an n-stack 1 peg, you first have to move an n-1 stack 2 pegs, then move the n-th disk 1 peg and then move the n-1 stack 2 pegs. Thus, $f(n) = g(n\text{-}1) + 1 + g(n\text{-}1) = 2g(n\text{-}1) + 1$. To move an n-stack 2 pegs, you first have to move an n-1 stack 2 pegs, then move the n-th disk 1 peg, then move the n-1 stack 1 peg, then move the n-th disk 1 peg and finally move the n-1 stack 2 pegs. So, $g(n) = g(n\text{-}1) + 1 + f(n\text{-}1) + 1 + g(n\text{-}1) = 2g(n\text{-}1) + f(n\text{-}1) + 2$. Substituting for $f(n\text{-}1)$ gives $g(n) = 2g(n\text{-}1) + 2g(n\text{-}2) + 3$. We also have $g(n) = f(n\text{-}2) + 1 + f(n\text{-}1) + 1 = f(n\text{-}1) + f(n\text{-}2) + 2$. Substituting this into the equation for $f(n)$ gives $f(n) = 2f(n\text{-}1) + 2f(n\text{-}2) + 3$.

n	1	2	3	4	5	6	7	8	9
f(n)	1	5	15	43	119	327	895	2447	6687
g(n)	2	7	21	59	163	447	1223	3343	9135

The non-recursive formulas are most easily found through internet search at oeis.org, sequences A005665 and A005666.

$f(n) = (\sqrt{3}/6)\,[\,(1+\sqrt{3})^{n+1} - (1-\sqrt{3})^{n+1}\,] - 1$

$g(n) = (\sqrt{3}/12)\,[\,(1+\sqrt{3})^{n+2} - (1-\sqrt{3}^{n+2}\,] - 1$

Computer Bonus Without loss of generality, one can estimate the expected value of the number of calls to get a Bingo on a randomly selected card using a Monte Carlo technique, i.e., by simulating multiple sequences of randomly drawn balls and filling in a single fixed card. Our estimates calculate that, on average, **41.37** balls are required to get a Bingo.

NEW FALL PROBLEMS

1 At exactly noon, Bob left the Red Lion at Upper Darby and set off by foot on the trail to the Purple Cow in Lower Merion. At exactly noon, Carl left the Purple Cow and set off by bicycle on the same trail for the Red Lion. When they met, Bob had covered 4 miles. After a 10 minute chat, Carl gave Bob the bike and walked on to the Red Lion, where he drank a bottle of beer in 3 minutes and set off again for the Purple Cow. Bob, as soon as Carl left him, cycled on to the Purple Cow, drank a bottle of beer in 3 minutes, and cycled off again toward the Red Lion. This time they met 7 miles from the Purple Cow and discussed football for 10 minutes. Then Bob relinquished the bike and walked on to the Red Lion, and Carl cycled on to the Purple Cow. Each drank another bottle of beer, in the same time as before, and off our heroes went again with Carl still riding and Bob afoot. They collided with each other 2 miles from the Red Lion. If they each maintain their own individual walking and riding rates for the entire episode, how far is the Red Lion from the Purple Cow?

—A Tantalizer by Martin Hollis in *New Scientist*

2 Ann collects stamps. She has half as many from Canada as from Japan; one tenth as many from France as from Denmark; one fifth as many from Libya as from Egypt; five times as many from Haiti as from France; two fewer from Libya than from Canada; three times as many from India as from Canada; half as many from Australia as from Korea; one fewer from Korea than from India; four times as many from Brazil as from France; and twice as many from Guatemala as from Libya. Ann has a total of 303 stamps. How many Canadian stamps does Ann have, and how many French stamps?

—*Logic Puzzles to Bend Your Brain* by Kurt Smith

3 Consider all possible cryptic additions with only two addends, where the addends may be strings of any length. An example of such a cryptic is: ABCA + DCDCD = ABCDE. The solution to this cryptic is: 5275 + 47474 = 52746. We are concerned with cryptics that have a unique, that is only one, solution in base 10. For such a cryptic, define its N-value as the number resulting from deleting the + and = signs from its solution. For example, the N-value of the above cryptic is 52,754,747,452,746. Cryptics, such as A + B = C, with more than one solution, have no N-value. Of all possible N-values, what are the four smallest?

—An Enigma by Keith Austin in *New Scientist*

4 What is the probability that a positive integer, N, chosen at random, will have no repeated prime divisors? That is, if p is a prime divisor of N, then p^2 is not a divisor of N?

—*A Biography of the World's Most Mysterious Number* by Alfred S. Posamentier and Ingmar Lehmann

5 A young Tau Bate is contemplating her financial future. Confident in her engineering skills, she assumes that her salary will increase 5% annually for an indefinite time. On the advice of a financial planner, she intends to invest 10% of her total income (salary plus dividends) at the end of each year in a respected mutual fund. The fund pays out a flat annual dividend of 10% at the end of each year. The principle is to remain invested indefinitely. For year 1, her income is simply her starting salary S, and she invests 10% of that. In year 2, her total income is 1.05 S plus 10% of her accrued investment, which is 0.1 S. At the end of the year, she adds 10% of her year 2 income to her investment. Find closed formulas for her total income for year N, and for the total amount invested at the beginning of that year.

—Adapted from George Boole, 1860

Bonus Find positive integers a, b, c, and d which simultaneously solve the following two equations:

$a^2 + b^3 = c^4$

$a^4 + b^6 = d^7$

Find the solution with the smallest value of d. Note that zero is not a positive integer.

—Allan Gottlieb's Puzzle Corner in *Technology Review*

Computer Bonus In a children's game called Beetle, the object is to draw a beetle based on the results of throwing a die. Each face of the die allows adding a different part to the beetle: 1-body, 2-head, 3-eye (two needed), 4-feeler (two needed), 5-leg (six needed), 6-tail. You must have a body before you can add any other parts, and you must have a

(Continued on page 61)

CHAPTER ETERNAL

The condensed style of these notices of death is made necessary by Tau Beta Pi's large membership and space limitations in The Bent. *You may email or write the Editor for further facts concerning the following deceased members. The assistance of all is earnestly sought in reporting the deaths of Association members, with appropriate details.* You may report the death of a member by sending an email to chapter.eternal@tbp.org.

AL A '48 **Teeple, Robert Perry;** no details.
'50 **Gadilhe, Charles Eugene;** March 28, 2013.
'51 **Blair Sr., John A.;** April 23, 2013.
'51 **Williams Jr., Henry Houston;** June 5, 2013.
'53 **Tatum Jr., James T.;** no details.
'55 **Landstreet Sr., Charles M.;** April 20, 2013.
'56 **Hooper, Edward H.;** July 8, 2013.
AL B '37 **Ellis Jr., Giles Milton;** June 1, 2013.
'43 **Winters, Leo H.;** March 26, 2013.
'50 **Asquith, Robert Charles;** May 10, 2012.
'08 **Pickens, Germanique M.;** April 28, 2013.
AL Δ '86 **Freeman, Benny C.;** 2010.
AZ A '50 **Humphrey, William A.;** April 5, 2011.
'56 **Prator Jr., John C.;** April 19, 2013.
'60 **Sizemore, Wayland W.;** September 6, 2007.
AZ B '58 **Bock, Joseph J.;** January 28, 2011.
'68 **Heldenbrand, Roger W.;** April 26, 2011.
AR A '58 **Floyd, Virgil Omah;** July 2, 2009.
CA A '47 **Gourrich, George Elihu;** June 6, 2013.
'50 **Lytle, Dean W.;** October 12, 2003.
'52 **Martinovich, William;** June 5, 2013.
CA B '34 **Clauser, Francis H.;** March 3, 2013.
'47 **Mueller, Albert H.J.;** no details.
CA Γ '52 **Trinaystich, John A.;** August 2012.
'93 **Harrison, Keith Andrew;** September 2, 2012.
CA Δ '51 **Goatcher, Eugene Merle;** August 25, 2012.
'58 **Girouard, William F.;** January 3, 2013.
CA E '71 **Engman, David C.;** no details.
'81 **Chin, Ronald A.;** April 2011.
CA H '65 **Andrews, Philip Melvin;** May 8, 2013.
'66 **Werner, Donald Lee;** January 4, 2013.
'77 **Howard, Frank A.;** September 11, 1994.
CA Θ '61 **Grove, Charles Franklin;** March 7, 2012.
CA I '86 **Inouye, Julie Y.;** no details.
CA K '75 **Lawrence, Oscar William;** July 16, 2012.
CA Λ '85 **Wortman, Robert S.;** November 18, 2010.
CA M '58 **Howell, Gerald A.;** February 7, 2013.
'78 **Tiura, James Andrew;** September 2, 2009.
CA N '72 **Skeen, Leroy E.;** December 10, 2011.
'83 **Gardner, Douglas L.;** August 18, 2006.
CA Σ '48 **Nawoj, Henry J.;** March 26, 2013.
CO A '36 **France, Robert E.;** February 7, 2013.
'41 **Madden, Lloyd W.;** December 26, 2011.
'44 **King Jr., Ben H.;** May 11, 2013.
'78 **Peaslee, Kent D.;** May 17, 2013.
CO B '44 **Adams, Edward E.;** February 23, 2013.
'45 **Cullick, Isaac;** December 6, 2005.
'48 **McDonnell, Sanford N.;** no details.
'49 **Purcell Jr., Robert Hart;** June 8, 2013.
'50 **Klinker, Robert John T.;** March 24, 2013.
CO Γ '50 **Jenkins, Walter F.;** March 27, 2013.
'51 **Pratt, Wayne Orton;** November 17, 2007.
'54 **Hauenstein, Clifford A.;** December 17, 2008.
CT A '48 **Arthur, George Roland;** July 28, 2007.
'49 **Case Jr., Robert O.;** no details.
'52 **Freedman, Raymond J.;** August 2012.
CT B '38 **Lof, John Lars Cole;** April 10, 2013.
'67 **Patsky, Raymond Robert;** June 24, 2013.
CT Γ '56 **Gardow, Ernest B.;** June 30, 2012.
DC A '57 **Walker Jr., M. Lucius;** June 6, 2013.
FL Δ '69 **Martin, Robert J.;** August 26, 2009.
GA A '38 **Boy, John B.;** July 16, 2013.
'40 **Gray, John Lawrence;** November 22, 2010.
'43 **Innes Jr., Theodore John;** August 22, 2005.
'46 **Fitzgerald, J. Edmund;** April 13, 2007.
'48 **Owen, Robert E.;** August 26, 2011.
'50 **Hitch, William H.;** December 2012.
'52 **Ford, Joseph;** 1995.
'52 **Quentel III, Charles E.;** August 2011.
'53 **Boal, Jan L.;** January 16, 2013.
'53 **Price, James Irvin;** March 4, 2013.
'55 **Burgess, Jack L.;** no details.
'57 **Mangham, Arnold;** November 13, 2012.
'58 **Boughnou, Thomas R.;** May 2009.
'58 **Duckett, Kermit Earl;** June 19, 2013.
'62 **Barksdale, Richard D.;** no details.
'69 **McKay, James E.;** September 21, 2012.
'87 **Cribb, Richard M.;** April 23, 2013.
ID A '33 **Martin, James William;** January 4, 1998.
'79 **Fujiki, Cory;** July 15, 2002.
IL A '44 **Speaker, Richard L.;** January 25, 2010.
'47 **Leininger, Arthur J.;** March 23, 2011.
'49 **Peterson, Chester Max;** October 5, 2012.
'49 **Pikna, Raymond J.;** January 2, 2012.
'51 **Pentecost, Joseph Luther;** no details.
'55 **Hall, Wayne Edward;** January 15, 2012.
'58 **Corley, William Gene;** March 2, 2013.
'59 **Pace, James Richard;** July 1, 2013.
'60 **Huizinga, Donald D.;** June 22, 2013.
'67 **Lord, Thomas Francis;** August 30, 2011.
IL B '40 **Hunter III, Thomas Alexander;** April 28, 2013.
'45 **Horita, Kaz;** no details.
'50 **Hawkes, Albert Kilgour;** June 10, 2013.
'55 **Seidensticker, Ralph William;** July 6, 2013.
IL Γ '50 **Homan, Charles J.;** March 19, 2013.
IL Δ '50 **Weinberg, Philip;** February 2, 2012.
'62 **Chalkey, Ronald E.;** January 24, 2012.
IN A '40 **Ancker Jr., Clinton James;** March 12, 2008.
'42 **Whippo Jr., Harrison M.;** January 27, 2012.
'48 **Klein, William C.;** October 2, 2012.
'48 **Weeks, Robert W.;** no details.
'49 **Whitesell, Lowell Glenn;** March 23, 2013.
'51 **Buffington, Royce;** June 7, 2013.
'51 **Lovell Jr., Charles W.;** June 15, 2013.

'53 **Kleine, Glen William;** June 17, 1995.
'54 **Blaschke, Theodore C.;** April 13, 2013.
'58 **Cengel, John Anthony;** November 8, 2012.
'60 **Stevenson, Warren Howard;** March 25, 2013.
'68 **Post, Donald George;** April 10, 2012.
IN B '58 **Williams, John R.;** March 8, 2013.
IA A '43 **Lippenberger, Donald V.;** March 9, 2013.
'49 **Piper, Myron McClellan;** May 8, 2003.
'58 **Runyan, Wesley Garner;** March 30, 2012.
'59 **Samuels, Robert Lynn;** April 4, 2006.
'63 **Griffin, John E.;** February 3, 2013.
IA B '48 **Meyer, Randall;** December 7, 2012.
'56 **Nunn, Paul K.;** September 30, 2010.
'58 **Baerwald, Dean L.;** December 2011.
KS A '34 **Porter, Richard W.;** 1996.
'38 **Wilson, Donald G.;** December 30, 2012.
'48 **Rummer, Dale Ivan;** October 5, 2012.
'56 **Book, James L.;** October 28, 2012.
'69 **Kimble Jr., Gerald A.;** September 21, 2012.
KS B '70 **Bontrager, Mervin Jay;** July 25, 2000.
KS Γ '90 **Friesen, Brad J.;** May 17, 2007.
KY A '50 **Threlkeld, Paul H.;** July 26, 2013.
'51 **Samuel, Billy Proctor;** July 29, 2012.
'58 **Calvert, Gerald Dean;** April 26, 2013.
'70 **Stacy, William Neville;** February 2, 2013.
LA A '36 **Schweizer, Charles B.;** May 12, 2013.
'38 **Hawkins Jr., Murray F.;** March 7, 2013.
'56 **Galster, Leonnard Taft;** May 30, 2010.
LA Γ '50 **Gorton, Charles W.;** February 10, 2013.
'52 **Lutz, Clifford Lewis;** July 10, 2013.
'52 **McDonald, James Herschel;** June 2, 2013.
'56 **Bulloch, John Barry;** September 22, 2010.
'00 **Rogers, Scott Christopher;** April 25, 2013.
ME A '72 **Beal, Samuel Wayne;** September 17, 2011.
MD A '37 **Peale, Walter Orville;** no details.
'40 **Scharpf, Carl Albert;** June 2, 2013.
'51 **Esterson, Gerald L.;** no details.
'60 **Taylor II, William H.;** June 13, 2011.
MD Γ '88 **Rife, Stephen Charles;** November 5, 2010.
MD E '97 **Fraser, Errol L.;** October 18, 1998.
MA A '31 **Woodward, Charles E.;** Sept. 24, 2011. [Cent. 83]
'39 **Martin, Robert W.;** March 7, 2013.
'49 **Madwed, Sidney;** July 4, 2013.
'53 **Dechand, Charles Otto;** June 20, 2013.
MA B '39 **Silber, Sidney;** July 30, 2013.
'48 **Kirchner, Mark E.;** December 21, 2010.
'52 **Bose, Amar G.;** July 12, 2013.
'60 **Hagen, Kenneth E.;** September 19, 2007.
'63 **Reiste, David J.;** December 2011.
'66 **Eldis, George Thomas;** November 1, 2012.
'68 **Himes, John Glenn;** no details.
MA Δ '37 **Maxwell, Donald Eugene;** August 7, 2007.
'58 **Feinstein, Sumner S.;** November 9, 2012.
MA E '51 **Noymer, Arthur A.;** January 13, 2013.
'56 **Nackley Jr., John Francis;** July 3, 2013.
'58 **Hohman, Merrill S.;** September 3, 2011.
'67 **Goodridge, Roy W.;** January 1, 2010.
MI A '47 **Peterson, Leroy L.;** June 8, 2013.
'50 **Bogan, Robert Francis;** August 27, 2012.
'56 **Kirby, Herbert Weldon;** June 2, 2013.
'83 **Dykema, David Bruce;** February 8, 1994.
MI B '42 **Mathews, Donald Ralph;** May 24, 2013.
'81 **Buczek, Matthew B.;** June 12, 2013.
MI Γ '39 **Anderson, John W.;** October 19, 2012.
'39 **Jaeger, Julius A.;** October 2007.
'42 **Manson, Samuel Stanford;** July 7, 2013.
'49 **Daily, Dallas F.;** March 31, 2010.
'49 **Morris, Philip W.;** no details.
'50 **Phillips, Donald Delaney;** January 10, 2013.
'55 **Gaberson, Howard A.;** June 9, 2013.
'56 **Kroll, Charles E.;** February 22, 2013.
'56 **Wiese, Ralph W.;** April 3, 2013.
'69 **Nelson, Kenneth W.;** May 4, 2012.
'71 **Schwartz, Michael Howard;** February 5, 2013.
MI Δ '80 **Fraczek, Stanley Francis;** June 5, 2006.
MI E '41 **Sarafian, Karl;** June 4, 2013.
MN A '47 **McKee, Robert White;** February 9, 2013.
'51 **Andersen, Laird Bryce;** March 6, 2004.
'77 **Dunn, James M.;** January 16, 2013.
MS A '50 **McDonald, Leroy Q.;** February 27, 2009.
'54 **Brackeen, Travis Wilburn;** July 14, 2013.
MO A '50 **Hunter, Robert Nelson;** June 3, 2013.
'67 **Macknik, Louis Stephen;** April 10, 2007.
'73 **Steen, Waldo Sherril;** June 3, 2013.
'77 **Baugher, Thomas Charles;** July 13, 2013.
MO B '55 **Paladin, Frank W.;** February 4, 2011.
'62 **Alcorn, Herbert Richard;** May 6, 2008.
MO Γ '43 **Moore, Richard K.;** no details.
'49 **Woehrle Jr., Harry G.;** August 15, 2012.
MT A '50 **Lansberry, John S.;** April 3, 2013.
MT B '60 **Hiers, Robert S.;** no details.
NH A '60 **Kimball, Richard M.;** April 27, 2013.
NJ A '51 **Moir, Charles;** May 17, 2013.
NJ Γ '51 **Boback, Micheal;** July 21, 2013.
'52 **Silverman, Robert M.;** February 8, 2003.
NY A '48 **Kiorpes, Charles A.;** March 22, 2013.
'51 **Bezkor, Edward Leon;** April 1, 2013.
NY B '40 **Sheppard, Robert Shares;** April 28, 2013.
'40 **Williamson, Robert C.;** March 19, 2013.
'41 **Cowles, William A.;** November 29, 2012.
'47 **Ryfun, John C.;** November 12, 2010.
'52 **Perry Jr., Edward Hart;** November 25, 2012.
'80 **Loniewski, Edward C.;** June 22, 2010.
NY Γ '42 **Douglas, James;** February 24, 2013.
'44 **McLellon, Waldron M.;** April 4, 2013.
'50 **Aubrey, William C.;** May 3, 2012.
'51 **Whitcomb, Rodney J.;** October 12, 2011.
'54 **Navratil, Lloyd G.;** November 24, 2008.
'55 **Orabona, Joseph Florentine;** April 22, 2013.
'56 **Peper, Frederick Henry;** May 7, 2013.
NY Δ '46 **Fraser, John P.;** February 2013.
'53 **Higgins Jr., John David;** June 21, 2013.
NY E '60 **Massaro, Felix Ephrem;** July 27, 2013.
'68 **Popek, Gerald John;** July 20, 2008.
NY Z '64 **Seewagen, William;** September 21, 2003.
NY H '42 **Lehman, Ben J.;** April 18, 2013.
'42 **Rodriguez, Joseph Louis;** April 29, 2013.
'49 **Fisher, Colman;** October 22, 2006.

'54 **Anderson, John J.;** October 21, 2003.
'67 **Wasserstrom, David Harvey;** May 10, 2012.
'75 **Crimmins, John David;** October 26, 2011.
NY Θ '46 **Hoy, Norman Adams;** June 4, 2013.
NY K '50 **Worbois, Robert J.;** May 5, 2013.
NY N '50 **Gough, John W.;** June 2012.
NY Π '80 **Arnold, Kenneth A.;** October 1, 2008.
NC A '50 **Brock, Avery Crissman;** February 24, 2013.
'51 **Alliss, Adli Awad;** April 23, 2013.
'61 **Person Jr., Lee H.;** April 29, 2012.
NC Γ '48 **Spilman, Thomas William;** June 15, 2012.
'49 **Bradley, Emmett Hughes;** June 27, 2013.
'49 **Floyd, William S.;** no details.
ND A '87 **Merbach, David Lynn;** March 27, 2011.
'91 **Brooks, Lee Mathew;** October 2011.
OH A '42 **Hubbell, Clifton H.;** September 27, 2012.
'46 **Acheson Jr., Louis Kruzan;** March 2, 2008.
'60 **Hobbs, Robert W.;** January 11, 2013.
OH B '47 **Westermann, Fred E.;** January 15, 2013.
'48 **Osborne, Samuel Rush;** February 27, 2013.
'55 **Best, Robert A.;** May 27, 2013.
'55 **Utsch Jr., Linus Frederick;** June 28, 2013.
'80 **Velikoff, Alex E.;** no details.
OH Γ '43 **Hollingsworth Jr., Marion;** June 30, 2013.
'43 **Leslie, William C.;** November 8, 2003.
'48 **Buchholtz, William L.;** November 2011.
'51 **Bauer, Andrew B.;** September 6, 2010.
OH Δ '57 **Cooke, Thomas C.;** January 4, 2013.
'81 **Nogrady, John Gregory;** September 28, 2005.
OH E '49 **Ray, Frederick H.;** April 11, 2013.
'51 **Zenon, Zenn Z.;** July 7, 2013.
OH Z '44 **Netter, Milton A.;** September 30, 2009.
'61 **Bode, Wolfgang;** August 27, 2007.
OH H '78 **Griffin III, John C.;** February 26, 2013.
OH Λ '78 **Kurtanich, David G.;** July 18, 2013.
OK A '48 **Wilson, Lejeune;** 2012.
'73 **Alles, Rodney Neal;** July 18, 2007.
OR A '48 **Engelbart, Douglas Carl;** July 2013.
'78 **O'Neill, Timothy Edward;** May 24, 2011.
PA A '40 **Eler, Wellington Ballard;** no details.
'42 **Eisele, William A.;** May 17, 2012.
'42 **Sebold, Grendon Kenneth;** no details.
'43 **Moore, Robert Condit;** May 6, 2013.
'53 **Diercks, John C.;** April 8, 2013.
'57 **Latta, Andrew;** April 4, 2013.
'80 **Gabuzda, Joseph Cyril;** no details.
PA B '50 **Moser, Robert Raymond;** May 2, 2013.
'51 **Cavanaugh, Vincent J.;** June 5, 2013.
'70 **Amos, William E.;** March 22, 2013.
PA Γ '42 **McBride, Robert Hamilton;** June 22, 2009.
'42 **Van Arsdell Jr., John C.;** May 19, 2013.
'44 **Loper, Dwight Roger;** June 23, 2013.
PA E '39 **Landis, John W.;** March 16, 2013.
'49 **Albus, Donald R.;** October 1, 2012.
'61 **Kleppinger, Donald Dale;** no details.
PA Z '49 **Faye, Irving Aaron;** May 17, 2013.
'54 **Smith, David John;** March 12, 2012.
'69 **Stubblebine, William A.;** October 17, 2011.
'75 **Robusto, Stephen A.;** June 29, 2012.
RI A '54 **Roome, E. Gregory;** July 8, 2012.
SC B '62 **Leach Jr., William M.;** November 20, 2010.
'81 **Zejewski, Edward E.;** January 1, 2013.
SC Γ '59 **Giddings Jr., Glenn G.;** June 23, 2012.
TN A '40 **Wilson, James Clement;** February 13, 2013.
'43 **McCurdy, Harold Curtis;** June 28, 2013.
'49 **Dodson, William H.;** May 3, 2013.
'62 **Shofner, Frederick Michael;** April 25, 2013.
'66 **Blakemore, James E.;** December 5, 2007.
TN B '49 **Miser, James Wilson;** May 9, 2013.
TX A '48 **Swenson, Charles E.;** September 8, 1988.
'49 **Hellwig, Langley R.;** July 15, 2011.
'54 **Lee, Vernon A.;** November 19, 2012.
'54 **Schmidt, Robert Lee;** January 4, 2011.
'62 **Rothwell Jr., Ruel Richard;** May 31, 2013.
TX B '51 **Slagle, William C.;** no details.
TX Γ '47 **Pravel, Bernarr Roe;** April 28, 2013.
'69 **Posey Jr., Lloyd G.;** February 13, 2012.
TX Δ '40 **Mitchell, George Phydias;** July 26, 2013.
'54 **Hebert, John R.;** April 17, 2013.
'57 **Brady, Jack C.;** March 11, 2013.
'63 **Valade, Frank H.;** January 20, 2012.
'70 **Rector, Randy J.;** November 11, 2008.
'84 **Welch, Steve W.;** November 2012.
TX Z '71 **Kirkland, Robert A.;** March 2013.
TX H '67 **Dryden, Robert D.;** July 6, 2013.
'69 **Corbitt, Norman Earl;** November 4, 2010.
UT A '48 **Wadsworth, Milton E.;** January 31, 2013.
'49 **Watterson, Clark C.;** April 23, 2013.
'54 **Austin, Carl F.;** September 24, 2011.
VT B '53 **Abbott, Walter Hildreth;** July 29, 2012.
VA A '71 **Greene, John W.;** January 22, 2006.
VA B '42 **Pond Sr., Robert B.;** October 5, 2007.
'68 **Barker Jr., Raymond Henry;** May 4, 2013.
VA Δ '40 **Thompson Jr., Vester J.;** November 16, 2007.
'45 **Echols Jr., M. Patton;** July 26, 2012.
'47 **Morena, Salvatore J.D.;** no details.
'49 **Soucek, Leo Eugene;** April 2, 2013.
WA A '42 **Andrews, Glendon Louis;** October 31, 1992.
'47 **Alexander, Daniel E.;** October 26, 2010.
'47 **Wilson, Richard Amos;** October 3, 2012.
'53 **Hjorten, Alvin P.;** February 18, 2013.
'70 **Wilson, Charles Norman;** January 4, 2013.
'87 **Erwin Jr., Grant West;** June 12, 2012.
WA B '74 **Gregory, Randy A.;** October 23, 2010.
WV A '41 **Marsh, Hugh J.;** June 27, 2013.
'44 **Archer, John Skidmore;** July 25, 2010.
'51 **Long, David Earl;** June 29, 2013.
WV B '84 **Loudermilk, Dale H.;** no details.
WI A '40 **Casciaro, Anthony L.;** June 2008.
'42 **Thornbery, James M.;** January 7, 2006.
'43 **Rather, Norval E.;** May 26, 2012.
WI B '49 **Wagner, Owen R.;** March 20, 2008.
'51 **Pleiss, Bernard J.;** March 26, 2013.
'53 **Trautman, Robert S.;** January 25, 2013.
'55 **Glass, Tomas J.;** August 2011.
'63 **Garvey, Daniel C.;** September 19, 2012.

Brain Ticklers

(Continued from page 57)

head before you can add eyes or feelers. Calculate the exact expected number of die tosses required to complete the beetle.

—World's Greatest Dice Games

Send your answers to any or all of the Fall Brain Ticklers to **Curt Gomulinski, Tau Beta Pi, P. O. Box 2697, Knoxville, TN 37901-2697** or email to *BrainTicklers@tbp.org* as plain text only (no HTML, no attachments). The cutoff date for entries to the Fall column is the appearance of the Winter BENT in early January. The method of solution is not necessary, unless you think it will be of interest to the judges. We welcome any interesting problems that might be suitable for the column. The Computer Bonus is not graded. Curt will forward your entries to the judges who are **H.G. McIlvried, III,** *PA Γ '53*, **F.J. Tydeman,** *CA Δ '73*, **D.A. Dechman,** *TX A '57*, and the columnist for this issue,

—J.C. Rasbold, *OH A '83*

"THE BEST PEOPLE" ENGINEERING JOB BOARD

Through a partnership with JobTarget, Tau Beta Pi has a state-of-the-art job board. Members can post resumes, browse over 1,700 engineering jobs, faculty positions, and internships, and employers may browse resumes.

New opportunities are posted on our home page daily and a full list of openings are available by visiting *tbp.org/pages/ForMembers*.

POWERED BY JOBTARGET

TELL THE TALE... WIN A T-SHIRT

Send us your witty caption for this photo from our archives, and if it is judged one of the best, you will win a TBΠ t-shirt.

It shows Robert C. "Red" Matthews, Illinois Alpha 1902, retired Secretary-Treasurer aged 90, with unidentified friends at the 1969 Convention in Houston, TX. Email entries to *tbp@tbp.org* or mail them to HQ by November 1.

•We received thirty great entries for the Summer Caption Contest. Thank you to all who participated. Here are the five winning captions for the photo below:

"The fine civil engineering men of Illinois Alpha pilot testing the Illinois DOT latest idea for highway construction worker protection barriers.—*Solange C. Dao P.E., FL A '95*

"When they told us Tau Beta Pi would be more fun than a barrel of monkeys, this isn't quite what I expected."—*Matthew R. Gargani, PA Λ '14*

"Patent No. 677606 – An Apparatus for the Prevention of Wedgies"—*Keith A. Lyszkowski, NY Δ '90*

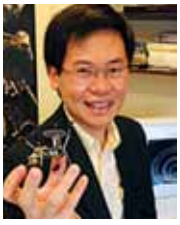
"I told you not to let engineers join our fraternity. See what happens when they plan a keg party!"—*Frank P. Tuhy, NJ B '65*

"Can't we just have a secret handshake!" —*Richard A. Suhar P.E., OH Λ '83*

Congratulations to the winners!

California Beta

Melvin B. Leok, Ph.D., '00, is a tenured professor of mathematics at the University of California, San Diego, where his research in applied and computational mathematics is supported in part by grants from the National Science Foundation, including a Faculty Early Career Development (CAREER) award. His primary research interests are in computational geometric mechanics, computational geometric control theory, discrete geometry, and structure-preserving numerical schemes.



California Gamma

Alan W. Ezekiel, '90, has graduated cum laude from Harvard Law School. He recently published an article in the *Harvard Journal of Law & Technology* entitled 'Hackers, Spies, and Stolen Secrets: Protecting Law Firms from Data Theft.'

California Upsilon

Justin Wilke, '10, is an engineering services specialist at Siemens Industry, Inc., in Sacramento, CA. He is in the infrastructure and cities section of the rail systems division.

Colorado Alpha

Timothy A. Barbari, Ph.D., '79, has been appointed to the new position of associate provost for graduate affairs at Boston University. He is also professor of biomedical engineering. Barbari was formerly dean of the graduate school of arts and sciences and associate provost for research at Georgetown University.

Florida Delta

Donald D. Jacobovitz, P.E., '98, was named to the national Top Ten Public Works Leaders of the Year by the American Public Works Association (APWA). He is public works director for Putnam County, FL. Jacobovitz's leadership activities include involvement with APWA's Emerging Leaders program since 2003 and the institution of a leadership training series for all Putnam County public works supervisors.

Illinois Alpha

Hillery C. Hunter, Ph.D., '99, is the systems memory strategist and manager of the systems technology and architecture department at IBM's T.J. Watson Research Center in Yorktown Heights, NY. She is interested in cross-disciplinary technology topics, spanning silicon to system architecture, and has most recently published in the areas of embedded DRAM and DRAM main memory systems. Dr. Hunter is a member of the IBM Academy of Technology.

Kansas Beta

Maher M. Shariff, Ph.D., '00, is a research scientist at the Saudi Aramco research and development center in Dhahran, Saudi Arabia. He recently completed a year as a visiting scholar at the University of Tulsa school of petroleum engineering.

Massachusetts Iota

Jason C. Keller, '05, is "a software developer, an avid athlete and outdoorsman, a kiteboarder, a motorcyclist," and solver of "very difficult problems." He is "The Solutions Guy" and prefers to work in the newer flavors of the .NET ecosystem and deploying business infrastructure to the cloud. Jason is based in Nashua, NH.

Missouri Beta

James L. Cale, Ph.D., '01, is manager for distributed energy systems integration at National Renewable Energy Laboratory at Golden, CO. He specializes in modeling and simulation of power systems, power electronics, electrical machinery, and feedback control systems. Specific areas of focus are high-penetration renewables, energy storage, smartgrids, and microgrids.

Nevada Alpha

Stanley K. Putman, '83, is now teaching 8th grade science in the Clark County, NV, school district. After 26 years of civil engineering experience, he looks forward to being a part of the increased focus on STEM classes for today's young students.

North Carolina Alpha

Thomas H. Prettyman, Ph.D., '90, is senior scientist at the Planetary Science Institute. He has been awarded funding from the NASA Innovative Advanced Concepts Program to develop a groundbreaking way to study the deep interiors of asteroids and comets using high-energy muons and other

particles generated by galactic cosmic rays.

Ohio Theta

Stephen W. Duda, P.E. '85, has been named a fellow by the American

Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE). The award recognizes members who have attained distinction in those fields, or as an engineering executive on projects of unusual or important scope. Duda is a senior mechanical engineer with Ross & Baruzzini, Inc., an engineering and architecture design firm in St. Louis, MO.

Pennsylvania Beta

Daniel J. Jenkins, '80, is an intellectual property counsel at Sandia National Laboratories in Albuquerque, NM. Previously he was an attorney at McNees Wallace & Nurick, LLC, in Harrisburg, PA., and a nuclear engineer at the U.S. Department of Energy.

Pennsylvania Delta

Mark G. Allen, Ph.D., '84, has been named by the University of Pennsylvania as the inaugural scientific

director of its new center for nanotechnology, which houses a 10,000-square-foot clean room and a suite of laboratories. Allen was executive director of the institute for electronics and nanotechnology at Georgia Institute of Technology, where he was professor of microelectronics.

Tennessee Alpha

David M. Korda, P.E., '99, has been appointed a vice president of Barge Waggoner Sumner and Cannon, Inc., an engineering and architecture services firm based in Nashville, TN. He has experience providing structural engineering design for diverse, multi-million dollar construction

projects. As manager of design services for industrial and building services, Korda has been responsible for project execution and delivery, quality of technical work, and final approval of drawings and calculation packages.

Tennessee Gamma

Jonathan M. Sprinkle, Ph.D., '99, is an assistant professor of electrical and computer engineering at the University of Arizona. The *Arizona Daily Star* reports that he has developed a tool for luring students as early as high school into writing software code—the chance to command a driverless full-sized vehicle. Ten undergraduate students are helping Sprinkle write code that will allow students at two local high schools to control an SUV using only a smartphone.

Texas Beta

Ernst W. Kiesling, Ph.D., P.E., '55, is a professor of civil engineering at

Texas Tech University and executive director of the National Storm Shelter Association (NSSA). He and his colleagues developed an above-ground shelter capable of providing a very high degree of protection from extreme winds. Texas Tech provided shelter designs and other input for the Federal Emergency Management Agency (FEMA) publications on storm shelters. Kiesling was instrumental in the founding of the NSSA and has served as executive director since 2001.

Texas Theta

David Zubia, Ph.D., '93, has been awarded a three-year grant of $895,000 from the Department of Energy to research the defects of solar cells and learn how to make them more efficient. He is professor of electrical and computer engineering at the University of Texas at El Paso. The grant is part of the DOE's Sunshot Initiative, which seeks to make solar energy in the United States cost-competitive with other forms of electricity.

Virginia Alpha

William O. Reeside, '77, recently became senior projects director for Day and Zimmermann, serving Duke Energy, one of D&Z's largest customers. D&Z provides staffing for nuclear power plant outages, maintenance and project work. Bill lives in Fort Mill, SC, and is now married to Sandy K. Reeside.

Virginia Beta

Chad E. Duty, Ph.D., '97, is group leader, deposition science and tech-

nology at Oak Ridge National Laboratory's manufacturing demonstration facility. He was previously solar program manager at ORNL. Chad is married to **Angel O. Duty,** Ph.D., '97, currently a stay-at-home mom, homeschooling their four children.

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Your fellow Tau Bates are interested in news about you. Send items about civic activities, honors won, weddings, births, promotions, changes in address, etc. to Tau Beta Pi, P.O. Box 2697, Knoxville, TN 37901-2697 or to *alumnote@tbp.org*. Material for publication must be received for the **Spring** issue by February 1, **Summer** issue by May 1, **Fall** issue by August 1, and **Winter** issue by November 1. Include name, address, chapter, class year, and email address or phone number. Thank you!

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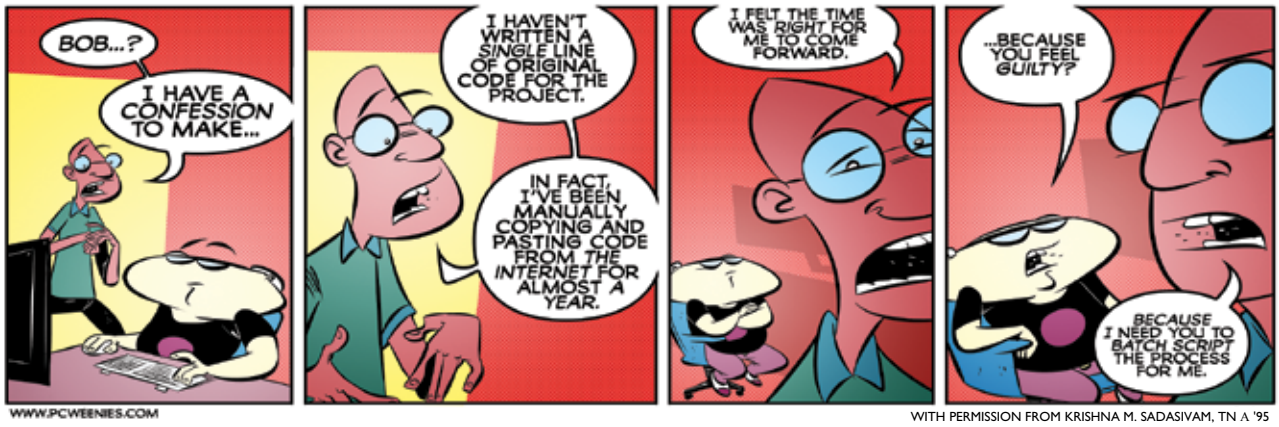

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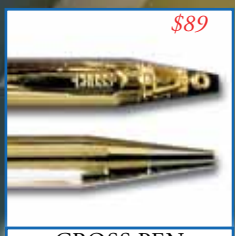

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