

MERLE CREW
MOVING FORWARD
A LEGACY

THE HARDROCK™

WINTER 2013

Christopher Redmond:

FEARLESS STORM CHASER

SOUTH DAKOTA



SCHOOL OF MINES
& TECHNOLOGY



THE HARDROCK™

The Hardrock is published semiannually by the SDSM&T Alumni Association and the South Dakota School of Mines & Technology Office of University Relations. The Hardrock is a trademarked name of the SDSM&T Alumni Association. Subscriptions are available free of charge. Submissions of articles, photographs, and artwork are encouraged but must include a self-addressed, stamped envelope to be returned. We reserve the right to edit submissions for style, clarity, and content. For information, subscription requests or address corrections:

**South Dakota School of
Mines & Technology**
Office of University Relations
O'Harra Building
501 E. Saint Joseph St.
Rapid City, SD 57701-3995
(605) 394-2554
mediarelations@sdsmt.edu
news.sdsmt.edu/hardrock/

STAFF

Executive Editors

Christy A. Horn
Tim Vottero (Chem84)

Managing Editor

Fran R. LeFort

Photography

Fran R. LeFort
Jon A. Michaels
Amy C. Wright
Madison M. Zimmerman-Dusek

Cover Photo

Christopher Redmond

Writers

Danielle A. Doran
Gretchen M. Kirchmann
Fran R. LeFort

Graphic Design & Layout

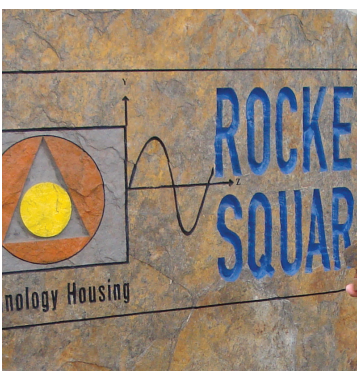
Madison M. Zimmerman-Dusek

Old ore chute on the road leading to Terry Peak ski area



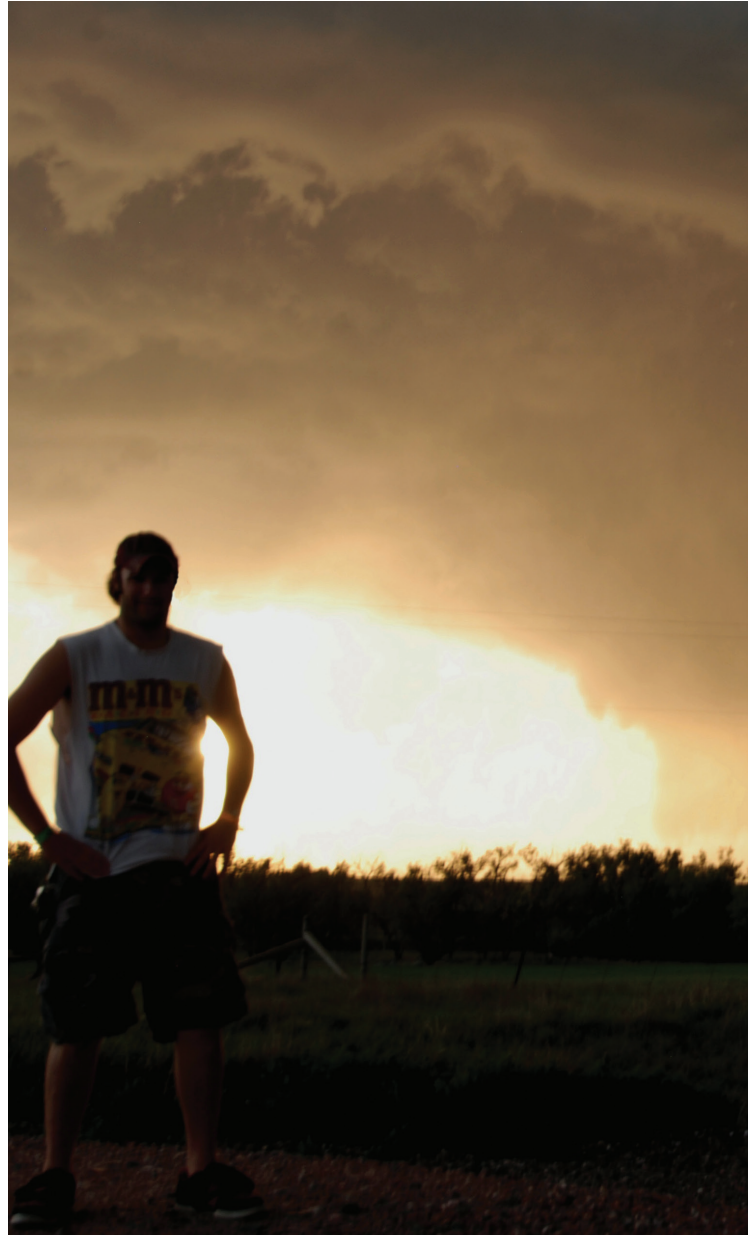
12 HIS LEGACY

President Robert A. Wharton spontaneously jumped on the ledge of Rocker Square's patio in August to offer a few unscripted words at the grand opening, prophetically referencing his "bucket list."



20 MAKING PROGRESS

Structural growth is but one example of the university moving ahead with its new Mines 2020 strategic vision and plan.



14 FEARLESS STORM CHASER

When at once the heavens turn angry and awesome, enter Christopher Redmond. Like the James Bond of storms, Redmond is fearless and free, adventurous and assured. But the life of a storm chaser requires a delicate balance of patience and energy, as well as courage and calm.



22 DIGGING UP HISTORY

It's nothing for this 1942 School of Mines alumnus to log onto Google Earth and pinpoint the exact coordinates of the Badlands location where he discovered what is believed to be the only complete skull of the predecessor to man's best friend—when he was just fifteen.

2 ALUMNI NETWORK

5 FROM THE PRESIDENT

6 LEGACY NEWS

7 PROFILES

8 CAMPUS INSIDER

10 RESEARCH REVIEW

25 COMMENCEMENT

26 CLASS NOTES

36 AREA MEETINGS

ALUMNI ASSOCIATION BOARD OF DIRECTORS

President

Keith Mutchler (ME71)

President-Elect

Carmen Adams (ChE75)

Immediate Past President

Joe Corbett (GeolE82)

Executive Vice President

Paul Gnirk (MinE59)

Treasurer

Mitch Slusarski (IE95)

Secretary

Tim Vottero (Chem84)

Board Members to 2013

Keld Ditlev (CE06)

Ron Jeitz (CE69)

Jerilyn Roberts (ChE99)

Bill Tucker (GeolE56)

Board Members to 2014

Susan Banks (GeolE75)

Roger Kiel (GenE58)

Michelle Miller (ME01)

Brad Thrall (MetE86)

Board Members to 2015

Wayne Baumberger (ME96)

Jason Erickson (CEng97)

Greg Hintgen (EE99)

Abran Kean (CEng03)

STAFF

Alumni Director

Tim Vottero

Administrative Assistant

Dee Raymond

Alumni Association

Surbeck Center

501 E. Saint Joseph St.

Rapid City, SD 57701-3995

Office: (605) 394-2347

Fax: (605) 394-2383

alumni@sdsmt.edu

<http://alumni.sdsmt.edu>

Greetings Alumni and Friends,

At the September Alumni Association board meeting, outgoing President **Joe Corbett** (GeolE82) passed the gavel, starting a new year. Many thanks to Joe, Past President **Pete Birrenkott** (ME70), outgoing board members **Casey Allen** (ME94), **Dale Healey** (IE06), **Mike Langerman** (ME72), **Bryan Schumacher** (CSc89), Alumni Director **Tim Vottero** (Chem84) and Administrative Assistant Dee Raymond, Executive Vice President **Paul Gnirk** (MinE59), and the entire board.

Congratulations and welcome to **Carmen Adams** (ChE75) for accepting the role as president-elect. We are excited about adding her energy and experience to the board. Carmen lives in neighboring Montana and enjoyed a successful thirty-three-year career with Exxon Mobil before retiring in 2010.

Mines is approximately 15,000 alumni strong. Many universities across the country graduate that many students in a year. Being a smaller organization has both its strengths and challenges, and the board this year will use unique features of Mines and its alumni in focusing on programs to strengthen our services.

It is our intent to support the Alumni Association mission through the following programs:

- **2013 Dedicated Mines Alumni**—No revenue source supports Alumni Association services beyond alumni donations. The goal is to reach “2013 Dedicated Mines Alumni” who would contribute at least \$100 annually to sustain the operating budget. Another option is to become a Lifetime Member via a one-time \$1,000 contribution. As a not-for-profit organization, ensuring a consistent income stream is critical and demanding.
- **Rebuild Alumni Gatherings**—One of our key alumni programs is facilitating area alumni gatherings. Our Relationship Committee, led by **Roger Kiel** (GenE58), is evaluating what has worked best, what regions are under served, what responsibilities are required by our area vice presidents, etc. These gatherings are only successful when well attended by alumni in the area.
- **Strengthen Recent Graduate Ties**—A key to long-term success needs to start with recent grads identifying with and taking pride in being Mines alumni. Obviously, new grads have a lot on their plate, but their initial support is critical. The Student Committee, led by **Ron Jeitz** (CE69), is leading this effort.

As a closing thought, the South Dakota School of Mines & Technology is blessed with being a university where there appears to be no end for the need of graduates in engineering and science. Where else can you be associated with this future and be a strong part of its past if not through the SDSM&T Alumni Association?

The Alumni Association Board meets quarterly, so any comments or suggestions you might have would be much appreciated. Please contact us via alumni@sdsmt.edu or me personally at Keith.Mutchler@yahoo.com.

Sincerely,



Keith Mutchler (ME71)

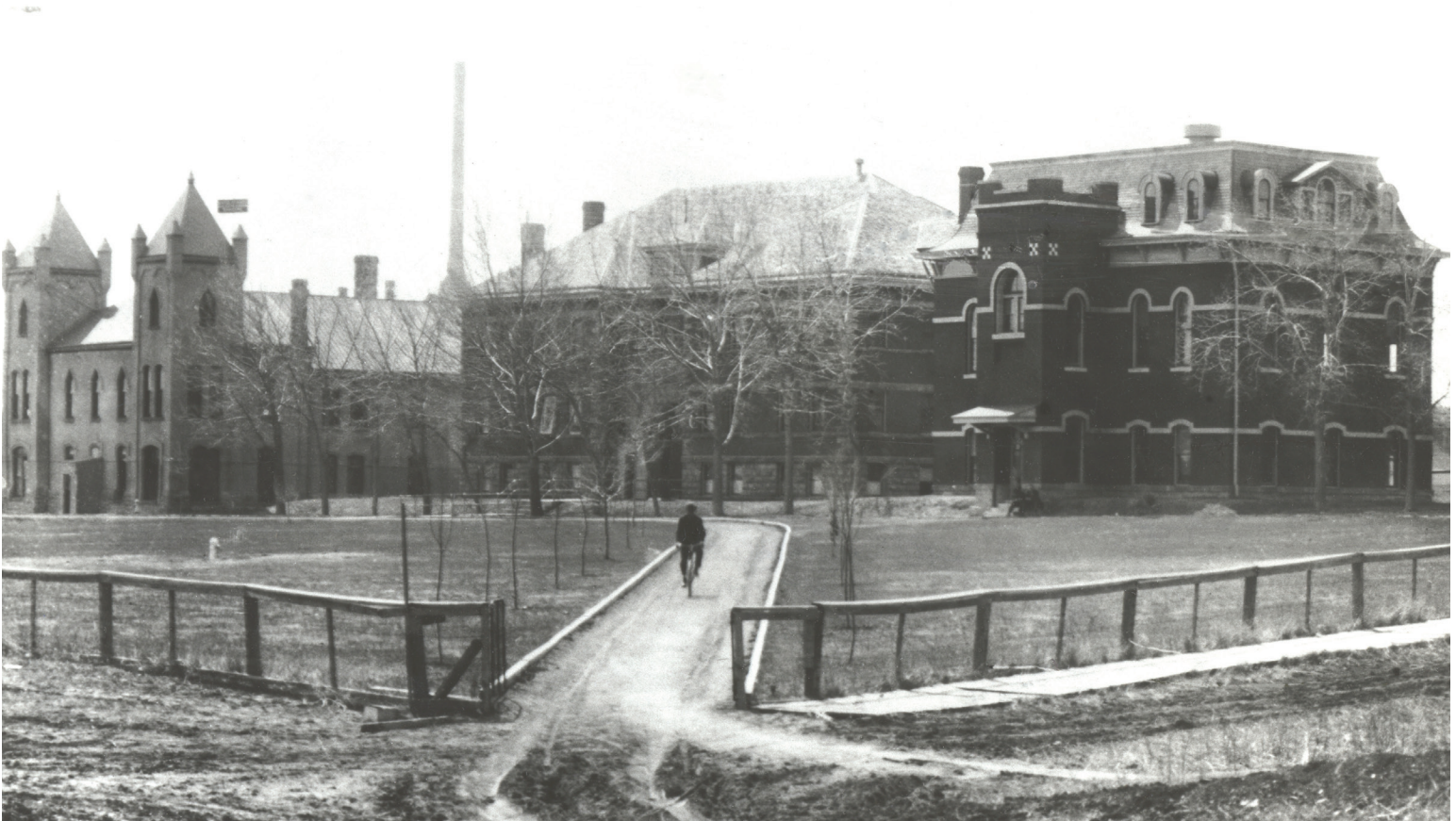
2013 SDSM&T Alumni President



A lone cyclist rides through the South Dakota School of Mines & Technology campus circa 1914. The three original buildings on campus were, from left, the Metallurgy Building, the main administration building, and what was referred to as the prep building, which was the first to be built when the School of Mines opened in 1885 and where the cornerstone was laid. Today's iconic arch in the quadrangle was constructed from the original entrance to the main administration building.

ALUMNI NETWORK

Flashback



125 Years Ago

Fall 1887/ Winter 1888

The last of the equipment arrived for the new Metallurgy Building. Instruction for mining and civil engineering programs, as well as the General Scientific Course, were approved during the fall. During the winter months, the water main was completed, along with the Metallurgy Building, at an original cost of \$40,000. On February 24, geology students made their first trip to the Badlands.

100 years ago

Fall 1912

Civil engineering students and professors built the first “M” on what is now M Hill. Horses carried more than 100 wagons of stones to form the “M,” measuring 112.5 feet tall and 67 feet wide. In 1922 the rocks would be replaced with 160 square feet of concrete, forming an “M” that could be seen from twelve miles away. That “M” stood alone another thirty-one years before being joined by the smaller “S” and “D” on either side in 1953.

75 years ago

Fall 1937

Courses in thermodynamics and other topics were assembled into a mechanical engineering department. A new introductory course in organic chemistry was also formed, largely to accommodate student nurses at St. John's Hospital. Enrollment was 6.6 percent higher than the previous fall, despite college enrollment as a whole statewide being down 1.34 percent. A survey showed that 40 percent of freshmen enrolled because a Mines graduate interested them.

50 years ago

Fall 1962

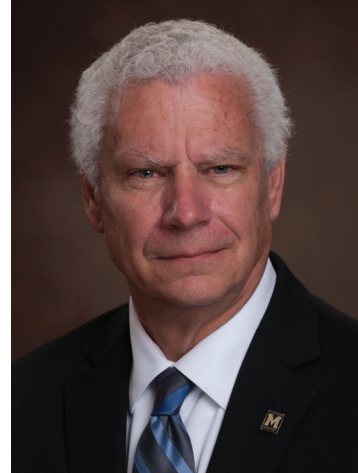
The seismograph was moved from the O'Harra Building to its own building on the hill just to the west of the Goodell Gymnasium. The Mineral Industries building was completed and the Metallurgy Building demolished. Master's programs in civil engineering and paleontology were established. Freshman Cheryl Harrelson was crowned M-Day Queen, marking the first time that a coed had reigned over homecoming activities.



Mines students pay tribute to the late President Robert A. Wharton during an emotion-filled candlelight vigil on September 24, 2012.

Dear friends,

It was a challenging beginning to the year for the School of Mines with the sudden passing of Bob Wharton. Dr. Wharton was a visionary, leader, and personal friend. He helped shape the future of the university through the creation of a new strategic plan which we are moving to an operational phase this year. Bob also started the campus moving forward in many areas including enrollment growth, addition of new faculty and staff, growth in research and new facilities worthy of our students and faculty. I intend to lead the School of Mines forward along this path. The achievements we realize will be a lasting legacy of Bob Wharton.



I invite you to take a close look at what is happening on the campus. It is an exciting time. This August we experienced a 5 percent enrollment growth and welcomed a number of new faculty and staff to the Mines family. Our students and faculty continue to push the creation of new knowledge which, in turn, will help drive the economic future for the state of South Dakota and the nation. Someone once said that presidents like to see dirt moving. This is so true. We have a variety of projects under way including the renovation of the old Chemistry/Chemical Engineering building, which will house new laboratories and offices to accommodate our growth. By early summer we hope to break ground on a new student recreation center and field house, more than doubling our existing wellness space and providing much needed health and wellness opportunities for current and future Mines students. We are continuing to bring together community stakeholders to provide safe, affordable housing for our students in the area just west of campus. Our Downtown Campus at 520 Kansas City Street opened this fall providing new teaching and learning space as well as a conference center. Our presence is a significant milestone in collaboration with the city of Rapid City and our neighbors.

I am excited about the future of the School of Mines. It is enjoyable to be able to grow from a position of strength. That strength comes from the reputation built by the accomplishments of our students, faculty, and alumni. I hope you will join me in celebrating our past and participating in the future.

Sincerely,

Duane Hrncir, PhD
SDSM&T Acting President

UNIVERSITY CABINET

Acting President, Provost, and VP for Academic Affairs

Duane C. Hrncir, PhD

Athletics

Richard Kaiser, EdD, Director

Finance and Administration

Timothy G. Henderson, VP

Research Affairs

Ronald J. White, PhD, VP

SDSM&T Alumni Association

Tim Vottero (Chem84), Director

SDSM&T Foundation

Mike Selzer (EE77), President

Student Affairs

Patricia G. Mahon, PhD,
VP and Dean of Students

University Relations

Christy A. Horn, VP

Graduate Education

Douglas Wells, PhD, Dean

Facilities Services

Clay Noble, Director

Faculty Senate

Edward Corwin, PhD, Chair

Human Resources

Kelli R. Shuman, Director

Career Service Employees

Monica Darrow, Chair

Exempt Employees

Trevor Schmelz, Chair

Student Association

Spencer Ferguson, President

South Dakota School of Mines & Technology does not discriminate on the basis of race, color, national origin, military status, gender, religion, age, sexual orientation, political preference or disability in employment or the provision of service.

Mines receives \$49 million Schlumberger gift

A \$49 million Schlumberger software gift will be incorporated into petroleum-related coursework in the South Dakota School of Mines & Technology Department of Geology & Geological Engineering, a significant step in developing a stronger energy program at the university. The package includes four types of commercial-grade software to help interpret the geology of petroleum fields and plan for drilling and production.

The gift will serve as an important recruiting tool, as Mines students with a working knowledge of the software—and the research opportunities made possible by it—will be more sought-after than ever by industry.

For example, Petrel software will be used immediately in Mines research to evaluate the feasibility of oil and gas development of the Niobrara Formation on the Rosebud Sioux Reservation.

Foundation completes \$50 million campaign

The \$50 million Building the Dream campaign initiated by the SDSM&T Foundation in 2004 was completed in July with a total of \$53.6 million raised. More than 800 individuals and corporations gave at least \$5,000 to the campaign with fifteen donors giving more than \$1 million for scholarships, faculty support, student support, and capital infrastructure and improvements.

Specifically, more than \$18.2 million was raised for scholarships; \$6.7 million for faculty endowments and support; \$25.7 million for student programs, activities, and classroom support; and \$3 million for capital and building improvements.

Biodiversity expert is 2012 Mines Medalist

Diana Wall, PhD, recognized as one of the world's foremost experts on biodiversity, and director of the School of Global Environmental Sustainability at Colorado State University, was honored as the 2012 Mines Medalist.

Dr. Wall is researching how habitat diversity contributes to healthy, productive soils and the consequences of human activities on soil. Her expertise and prolific, groundbreaking research has led her from the Antarctic Dry Valleys, where Wall Valley was named for her research contributions, to sub-Saharan Africa, where she is a principal investigator for a Winslow Foundation grant. She is co-investigator for the National Science Foundation McMurdo Dry Valley Long Term Ecological Research site.

New program supports female students

A record number of forty-two female students are enrolled in the mechanical engineering department this year, and a new mentoring program aims to help keep them by offering a support base for women in the department which is 500 students strong.

Traditionally, many of the department's female students have transferred into other degree programs, largely because they don't know enough other women MEs and feel "untethered," believes Lisa Carlson, ME associate director of recruitment and graduate programs.

The program offers ongoing academic support and camaraderie opportunities for female students within the department.

For more Mines news visit news.sdsmt.edu.



Life in the limelight

Last fall's headline that went viral told the world what we already knew, that the School of Mines is a great return on investment. Our small engineering and science university made big waves in newspapers, on television, and online with a *Bloomberg Businessweek* story that essentially read: Mines graduates \$56,700 in starting salaries; Harvard graduates \$54,100.

The global headline sparked billboards throughout the Black Hills and dovetailed with a new Mines Pride campaign (facebook.com/minespride) and was but one of several back-to-back viral stories bringing international attention to the university. Another highlighted Mines' ground-breaking nanoparticle research efforts.

Our worldwide news simply helped to underscore what defines the university's Legacy of Excellence: Mines graduates are among the best paid and most sought after in the industries for which they have prepared.

Boycotting the Moscow Olympics

Newly-minted Hardrock Hall of Famer Duane Haugen tuned in to last summer's Olympics, eager to see the latest crop of sprinters. As he watched, time receded and another Olympic dream emerged.

March 1980: the Soviet Union invades Afghanistan. The US reacts sharply, suspending arms negotiations, condemning the USSR in the United Nations, and threatening to boycott the Moscow Olympics. Ensnared in these Cold War tensions is Haugen, track star, Olympic hopeful, Mines student.

Haugen dreamt of being an Olympian, finishing high school undefeated in the 100- and 200-meter sprints. Recruited by Mines to run track, he thrived on the competition in the classroom and on the field, remembering his teammates as "second to none"

with unmatched camaraderie and academic dedication.

Sophomore year brought the Olympic qualifiers. Haugen settled into a routine of morning swims, daytime classes, and evening practices. The payoff was worth it. With a series of 10.2-second 100-meter runs, Haugen was in.

But his wasn't the only race, as the Cold War reached new heights. When the USSR invaded Afghanistan, the US boycotted the Olympics in protest.

Haugen's dreams were shattered. Allan Wells took the gold that year in the 100-meter sprint. His time: 10.25 seconds, .05 seconds longer than Haugen's qualifier. "When you're eighteen or nineteen, that's your life. I did everything I could possibly do to go, and then for political reasons I couldn't. It tore my heart out with a spoon."

Unable to race in the Olympics, he sought new competition, transferring to Texas Tech University, and the conference that hosted the world's two fastest college athletes, and which also happened to be a good fit for him to finish his chemical engineering degree. But the damage was done. His ardor for running faded, and he focused on completing his bachelor's.

After graduation, Haugen joined Archer Daniels Midland, rising quickly to become the technical director of ADM Mexico. In 2001, Haugen moved to Iowa where he's worked ever since.

Inducted into the 2012 Hall of Fame, Haugen recalls the experience as emotional. "There's a very close and warm place in my heart for Mines. I wouldn't be where I am today without my experience (at Mines)."



University unearths rare find in Anderson



Laurie Anderson, PhD, was hired as head of the Department of Geology and Geological Engineering and director of the Museum of Geology in August 2011 with a broad vision to move the department and museum forward, which was matched in breadth by her accomplishments during her first year.

From securing a multimillion-dollar software donation to hosting a national oil and natural petroleum conference; from overseeing the preservation of 150 million-year-old dinosaur

fossils to nominating the 2012 Mines Medal Fellow, her impact has been immense.

Impressed that the School of Mines offered "the best of both worlds in higher education"—intimate classes and incredible research—Dr. Anderson's decision to take the job was easy. She remains inspired by a department that "cares about student success and providing opportunities for them" and by the students themselves, whose level of commitment is "remarkable." As is her own. She has placed

her department on a national platform, hosting conferences to discuss pressing global problems and helping to secure industry-grade software for student use.

"Coming from Louisiana, where rocks are a long way away, it's nice to step out your door and be able to see rocks. It's a strength of the department to be so close to the whole stretch of geologic history from the Badlands to the core of the Black Hills," a sight that might be her favorite vision of all.

Students find friendships and fun

College is an experience as much as an education, a whirlwind of memories filled with late-night cram sessions and early morning coffee runs, and a multitude of games, concerts, and plays in between. Through the Mines Buddies program, students reach out to disabled, college-aged peers within the community, offering a taste of campus vibrancy and in the process transforming their own lives.

Kori Clyde, a mining engineering and management senior, “had never done anything like this before” when her sorority was approached by Mines Buddies Director Janice Knutsen during the program’s inaugural year. Clyde decided to apply on a whim. Landing an interview and then a job as the campus coordinator, she began to engage in earnest, finding the results gratifying. “It’s such a good program, and I see the good things it does. ... It’s very rewarding and a lot of fun.”

Partnering with the not-for-profit Black Hills Works, Mines Buddies offers opportunities on campus and in the community, including Rush hockey games, Heroes and



Mines Buddies is a volunteer partnership between young adults with intellectual disabilities and SDSM&T students.

Hardrockers dances, events at Main Street Square, and tours at the Journey Museum.

The program also promotes awareness, offering seminars for Mines students to help understand perspectives of the intellectually disabled and how to treat people with disabilities with acceptance, dignity, and respect. Clyde explains that many people with intellectual

disabilities are high-functioning, independent, and employed.

Kicking off during the summer of 2011, with a state grant, the program has been an overwhelming success, with between twenty and thirty Mines students and buddies actively participating in the program each school year. As the program grows and becomes sustainable, Knutsen

has considered integrating it at other higher education institutions.

The most meaningful exchanges, however, come in the quietest of moments, as Mines students and their buddies hike in the hills or share a meal at Hoven’s Hub. Moments where Clyde says you “see it on their faces”—a quiet glow of happiness reflected in her own beaming smile.

Perfecting the art of science and statecraft

Many challenges facing the world today are unprecedented—difficult to define and nearly impossible to solve, resting at the intersection of science and politics, requiring the expertise of scientists and policy makers alike. P.V. Sundareshwar, PhD, associate professor in the Department of Atmospheric Sciences and the state’s carbon scientist, happens to be both.

Awarded a fellowship by the highly-selective American Association for the Advancement of Science, Dr. Sundareshwar in September

began serving a year-long appointment as a climate change advisor to the African Bureau of the United States Agency for International Development, traveling between Washington, DC, and Africa. He will work closely with the senior regional climate change advisor on adaptation, providing program planning and design support to missions throughout sub-Saharan Africa, transforming intellect into impact as science and statecraft become one.

Beanies rite of passage for Mines ‘frosh’

For the past twenty-five years Jan Rathbun and her local CK chapter of the Philanthropic Educational Organization have sewn 8,737 beanies for the School of Mines. On any given Tuesday morning in June and July a dozen or so of the ladies, who affectionately call each other the “Beanie Babes,” sit together hand-crafting the tight-fitting skullcaps for incoming freshman.

They took on the job in 1988 after the Iowa factory that had mass produced them stopped making the beanies. One of the last factory-produced Mines caps from 1985 is displayed in the Devereaux Library.

Frosh, what freshman are affectionately called for the first month or so of school until the end of M Week, have been wearing the beanie for ninety-two years. “My husband, **Grove Rathbun** (MinE52), has his beanie from 1948. We must be the only place in the world that still does beanies,” she said of the Mines’ freshman rite of passage.

Well documented through photos, little has been written about the beanie tradition, style or color changes over time. Today’s beanie is a green felt four-triangle pattern with a yellow “M,” but it wasn’t always so.

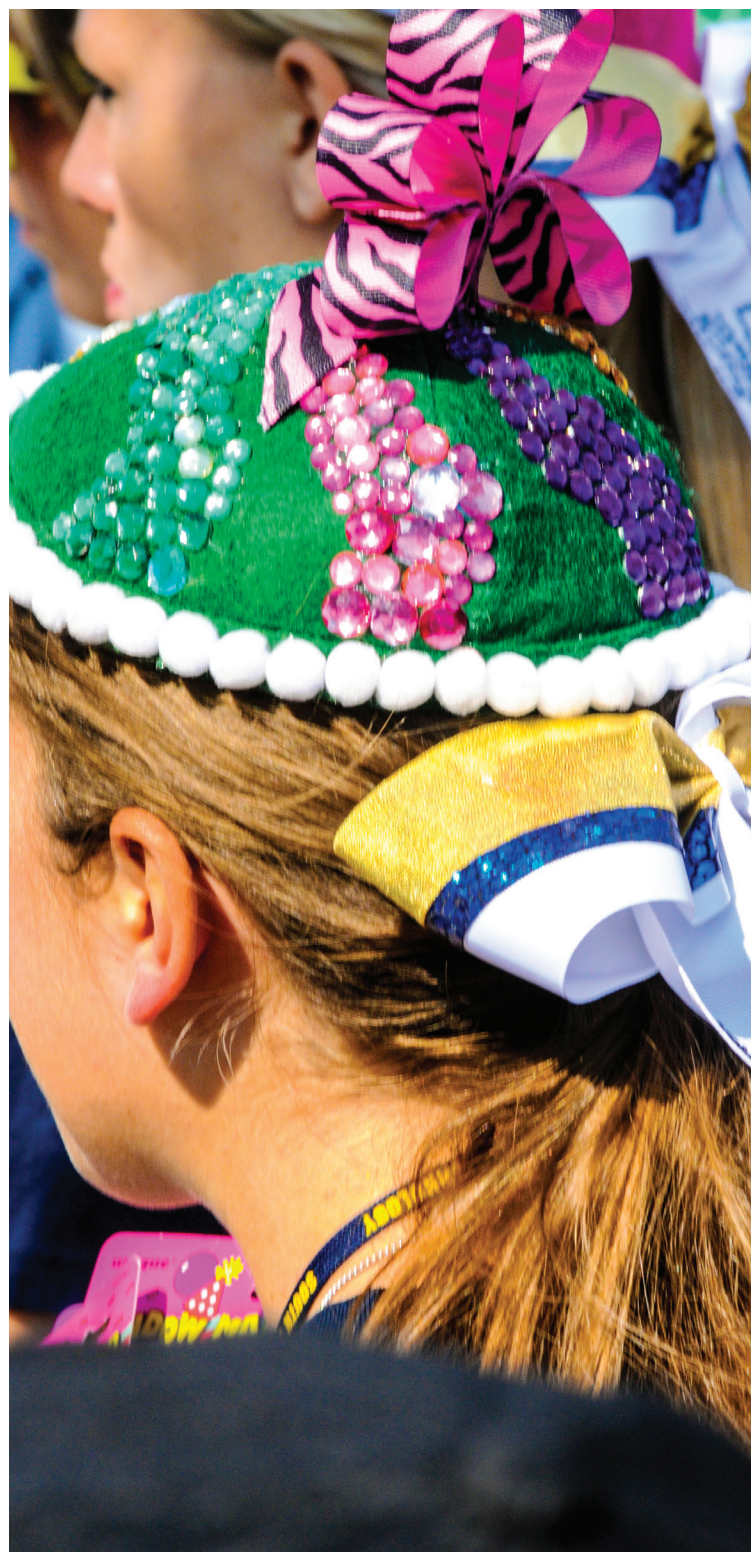
In a student newspaper story from *The TECH* in 1978, **Walter Bigstone** (MinE76) called the felt beanies “newfangled,” adding older iterations weighed about thirty pounds each because,

“They used to make the darn things in the metallurgy department out of copper, and if you were lucky enough to get a tarnished one, it was green.”

The Pahasapa Quarterly from 1920, Volume 24, in an article entitled “The Significance of the Freshman Cap on Our Campus,” wrote, “In future years the sight of the purple cap floating on the campus will serve as a pleasant reminder to visiting alumni of the days when they first wore the freshman headgear and of the various festivities connected with it. The Freshman Class of 1920 is to be complimented for its spirit of willingness and obedience to the wearing of purple.”

Why the first beanie was colored purple remains a mystery, as does the reason why it eventually became green and gold. Theories abound, however, including a popular one among today’s students, which says the green color has a little something to do with Mines’ new freshmen being smarter than even the seniors of a bitter rival school in the Black Hills region, a university which shall remain nameless for this story but whose colors are green and gold.

One plausible reason for a green college beanie in general, at least according to a South Carolina college archive, is tied to the idea of freshmen as “green” and new to the college scene.



Freshmen, endearingly known as frosh around campus until M Week, personalize their beanies with a variety of baubles, pins, and other novelties.

A new form of energy

H₂O. It is perhaps the most well-known, earliest-taught chemical formula in the universe. Chances are even the least scientifically-minded person knows that H₂O is water.

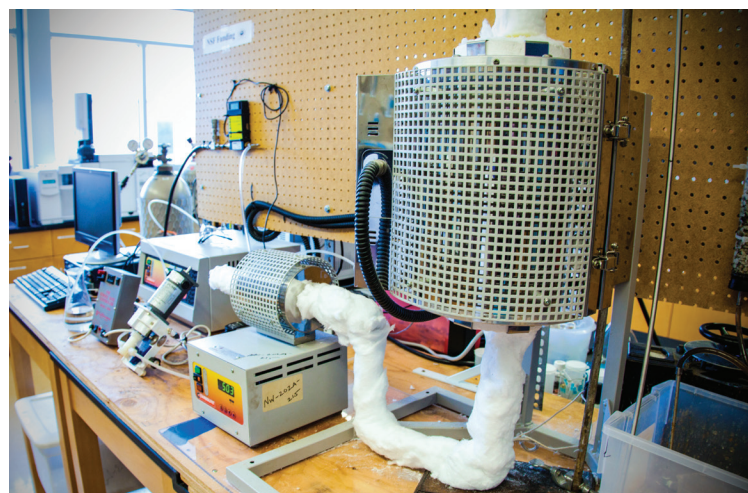
Two hydrogen atoms + one oxygen atom = one water molecule. What if scientists could take a water molecule's two hydrogen atoms and turn them into four hydrogen atoms? Check. What about taking those four and making eight? Check. Those eight into ...? Yes, yes. Check.

Finding a way of exponentially doubling hydrogen atoms to create a sustainable amount of hydrogen regeneration so that a new form of energy can be harvested is the ultimate goal of Mines researchers. Rajesh Shende, PhD, and Jan Puszynski, PhD, of the Department of Chemical and Biological Engineering, have been

awarded a \$299,975 National Science Foundation three-year grant to test high-temperature water splitting in multiple thermochemical cycles.

Using thermally-stabilized redox materials, particularly ferrites, already the team has documented reliable multiple-cycle results, sparking hope that sustainable hydrogen energy through the use of thermal hydro-splitting will one day be feasible, says Dr. Shende.

Just two other US locations, and possibly a third, are conducting similar research. One of the aspects that makes the Mines experiments unique is that the group has successfully split water molecules during multiple cycles at significantly lower temperatures than other documented research efforts. While others have demonstrated thermochemical splitting of



the water molecule at 800-1500 degrees Celsius, the School of Mines has documented multiple cycles at 700-1100 degrees Celsius, which could potentially lead to a more affordable large-scale effort. "In industry this will be more appealing," says Dr. Shende, who is filing an invention disclosure and who has published his findings in scientific magazines.

Higher temperatures normally cause particles to grow so large that hydrogen levels drop, causing very little hydrogen regeneration.

The Mines experimental studies look to stabilize the hydrogen levels, enhancing knowledge of the physical and chemical processes involved in thermal stabilization of redox materials' morphologies without deterioration of complex ferrites. "Others might be splitting water by other methods, but there has to be a lot of novelty to get funded," says Dr. Shende, who built a fully instrumented reactor in his campus laboratory.

Detecting counterfeit malaria drugs

Malaria claims about 655,000 lives each year, mostly in undeveloped countries. A third of drugs distributed to fight the deadly disease are counterfeit, with consumer packaging, weight of pills, and security holograms nearly identical to that of authentic medicines, making it difficult to distinguish the difference.

Researchers at the School of Mines have teamed with their counterparts at the Rochester Institute of Technology to develop chemistry tests which will detect active ingredients in authentic malaria drugs, thereby exposing counterfeit drugs.

"We are taking pure chemicals found in the pills and developing specific tests that will change color. We are optimizing all variables such as temperature, solvent, and reaction conditions to offer a simple, yet sensitive means of evaluating the quality and quantity

of a subset of malaria medications," explains Dan Heglund, PhD, analytical chemist and associate professor in the Department of Chemistry and Applied Biological Sciences.

Portable field-based chemical test kits currently offer confirmation for many different medications, including a one-color test for a malaria drug. The new research will help to not only identify authentic malaria medications but also confirm a correct dosage.

According to Dr. Heglund, when the specialized multiple-color (chemical reaction) tests are optimized, they will increase the capability of the current field testing minilabs by threefold for detecting authentic medications.

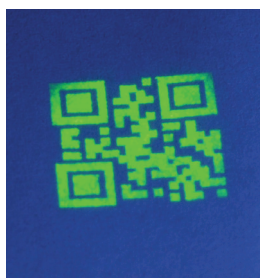
Covert QR codes

Invisible Quick Response (QR) codes could be the new defense against counterfeiting, aiding a multitude of security efforts for the US government. The pixelated black and white square has an increased presence on consumables and advertisements today, providing a quick link to digital content for smart phones users.

Secret codes embedded through nanoparticle-based inks may be invisible in ambient lighting but are readable with a near-infrared laser and have been successfully scanned using the common smart-phone. Use of this technology could thwart counterfeiting, detect national security breaches, and be used in many other applications.

And a team of Mines scientists has collaborated with researchers from the University of South Dakota to develop a process that can spray nanoparticle-based ink onto surfaces such as glass, plastic film, and paper.

Combining nanoparticles with blue and green fluorescent ink, the nano-code remains invisible until placed under a near-infrared laser, where it glows. This method holds great promise for routine security printing, especially on banknotes. The technology could also be applied to an expensive piece of art without affecting its appearance in any way.



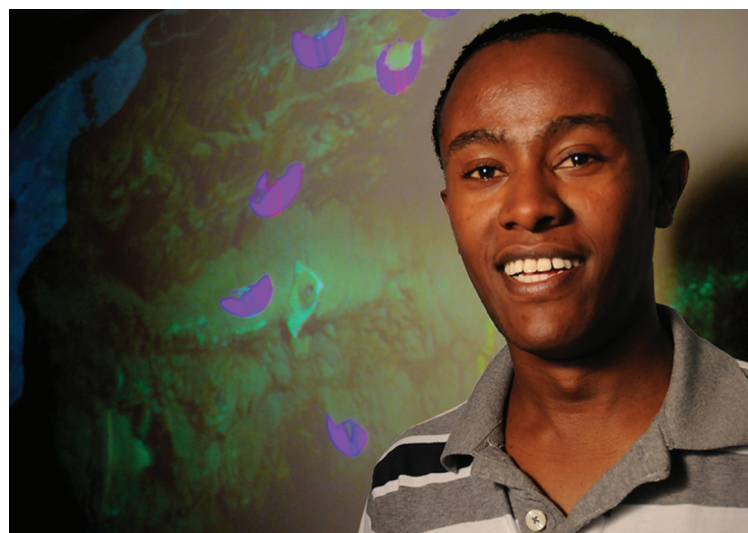
These covert QR codes could be used economically and efficiently for mass security printing, as inks are produced from inexpensive starting materials, with small amounts required to produce readable images. Multi-colored QR codes could be produced using various ink combinations.

“The QR code is tough to counterfeit,” says one of the Mines researchers, doctoral student Jeevan Meruga. “We can

also change our parameters to make it even more difficult, such as controlling the intensity of the light or using inks with a higher weight percentage of nanoparticles. We can take

the level of security from covert to forensic by simply adding a microscopic message in the QR code, in a different colored ink, which then requires a microscope to read the upconverted QR code.” Professor **Jon Kellar** (MetE84), PhD, and Associate Professor **William Cross** (MetE84), PhD, of the Department of Materials and Metallurgical Engineering, worked with Meruga.

The School of Mines received international media attention for its part in the work. The journal *Nanotechnology* published the research, which was then picked up by media outlets around the world, including the BBC, Huffington Post and *South Asia News*, to name a few.



Henok Tiruneh researches the stability of rocks nearly a mile below the earth's surface.

Stability deep below

PhD candidate Henok Tiruneh is ever mindful that his calculations deep below the earth's surface at the Sanford Underground Research Facility potentially possess life-shattering impact.

Whether it's mining for precious minerals or conducting neutrino research in a laboratory nearly a mile below the surface, those who would dare enter the earth's deepest crevices must know they will be safe from collapses. Research such as Tiruneh's is key. “For any future excavations you need data about the rock strengths. It is absolutely crucial to determine how rocks will behave,” says Tiruneh, whose research specialization is geological engineering.

His work focuses on characterizing rock discontinuities within the Davis Campus on the 4,850-foot level of the Sanford Underground Laboratory in the former Homestake Gold Mine, where the large cavities to support neutrino research will be constructed. Studying the discontinuities will provide data to build excavation models.

Tiruneh, who expects to complete his doctorate this spring, is using fine-scale, high-resolution 3D modeling to assess rock properties. He is developing new, groundbreaking criteria at a scale and resolution not attained before, according to **Larry Stetler** (GeolE79), PhD, Mines professor of geological engineering who nominated Tiruneh for the 2012 Mines Medal Graduate Student Fellowship, which he was awarded last fall.

Tiruneh chose the School of Mines because of its geomechanic research opportunities and plans to work in the United States for a few years before returning to his home country of Ethiopia to ultimately help harvest much-needed water from underground sources.

His legacy OF EXCELLENCE

President Robert A. Wharton spontaneously jumped on the ledge of Rocker Square's patio in August to offer a few unscripted words at the grand opening, prophetically referencing his "bucket list."

Within a month, he would leave this world too soon, stunning the campus community and beyond.

His "Legacy of Excellence" campaign for the university has suddenly taken on a new meaning as those closest to him remember his lasting impact. During his four years at the South Dakota School of Mines & Technology, President Wharton, PhD, established a clear blueprint, developed a long range thirty-year campus master plan to execute that vision, and opened four new buildings on or next to campus. Along the way he heightened a sense of Mines pride with an insistence on campus beautification.

"Not since President O'Harra (1911–1935) has so much been done in campus planning and expansion for classroom or research buildings, especially, in so short a time span," says campus historian Patty Andersen, Devereaux Library director who has served five presidents during her twenty-nine years at Mines. She also points to President Wharton's push for increased research and enrollment, in addition to new buildings, the Paleontology Research Laboratory, the Chemical and Biological Engineering/Chemistry Building, the Downtown Campus, and the private Rocker Square apartments. Also, a new student recreation center is being designed, and plans are moving forward to build a 120,000-square-foot research facility.

Mines alumna and South Dakota Board of Regents President **Kathryn Johnson** (PhD Geol86) remembers President Wharton's positive spirit and "can-do" attitude, exhibited during the Regents' board meeting on campus in December 2011, just after a biopsy on his neck, which ultimately revealed neck cancer. President Wharton pursued aggressive treatments and was declared cancer free by April. He died from complications on September 19, 2012.

"He explained that he had identified and taken on a big challenge. He described how he decided on what needed to be done and how to do it," Johnson remembers. "... I expect that President Wharton used the same approach, starting with a 'can-do' attitude, careful planning, with detailed follow-through, that got us the campus master plan, growth in enrollment, growth in the endowment, growth in research dollars, and so much progress here on campus."

Enrollment this fall jumped 5 percent to 2,424. Research dollars also swelled during his tenure to an all-time high of \$35 million in 2010. Despite the president's dedication to increasing the university's stature as a research institution, he always insisted education was the first job, remembers Edward Corwin, PhD, faculty chair, saying that recruitment became everyone's job.

President Wharton and First Lady, Carolyn Fassi Wharton, embraced the campus community as a team, often inviting students and other stakeholders into their home. Student Association President Spencer Ferguson remembers the late president as invested in students, highly visible, and involved. "He always shook our hand, knew our name, and engaged us in meaningful conversation."

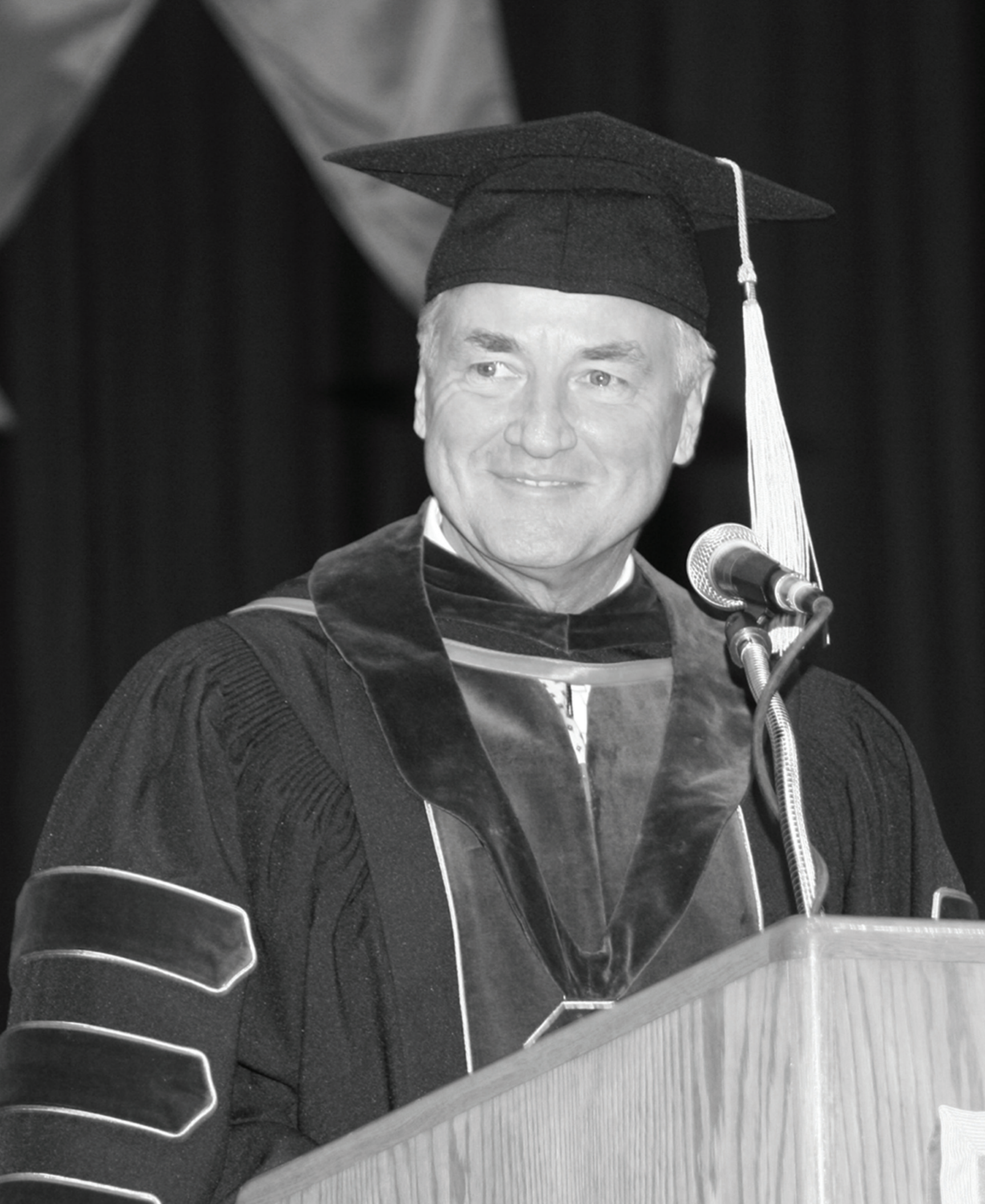
Regents CEO and Executive Director Jack Warner, EdD, remembers President Wharton's passion and ability to think big. "He knew how to lead people and inspire them to advance the vision." Indeed, all agree that President Wharton's ability to communicate, particularly within small, more personable group settings, was his genius.

"The events at his house were always a great forum for networking and getting serious work done in a friendly environment. He knew how to get the right people in the room and would take the time to make introductions to facilitate interaction without dominating the discussions," Dr. Corwin says, adding that the president took time to meet with all constituencies. "The faculty have always felt that Dr. Wharton truly believed in shared governance. ... I observed firsthand how hard the president worked to include alumni in his vision and how he did his best to be mindful of their comments relative to being true to the traditions of the institution."

One of his most obvious lasting legacies will be the 2009 founding of the national Mines Medal to recognize leaders in the areas of science and engineering and to bring attention to America's preeminence as a scientific leader.

As reputations take generations to build, President Wharton possessed a clear understanding and vision for the university, and his accomplishments were calculated, Dr. Johnson says. "We are fortunate to have those footprints to build upon as we move forward."

Indeed, his legacy of excellence has forever been cemented by how he invented tomorrow for the South Dakota School of Mines & Technology. And how he boldly attacked his bucket list.





The life and times of a FEARLESS STORM CHASER

When at once the heavens turn angry and awesome, enter Christopher Redmond. Like the James Bond of storms, Redmond is fearless and free, adventurous and assured. But the life of a storm chaser requires a delicate balance of patience and energy, as well as courage and calm.

Sometimes things have a way of working themselves out. As a third-grader Redmond begged his mom to let him watch “Twister,” but he was so terrified he had to sit in the hallway for much of the movie. Now a master’s degree candidate in atmospheric sciences, Redmond estimates he’s chased about two dozen tornadoes of his own during the past five years.

More than extreme thrill-seeking, Redmond hones his forecasting skills with each outing.

After a period of wandering in high school, Redmond, who grew up south of Akron, Ohio, renewed his interest in weather and entered Ohio University. “It was all downhill from there. We were there on one of my first storm chases a year after that. ... And that’s one of the reasons I came out here. I’m closer to tornado alley. I like storms in the high plains because they are usually more picturesque. They aren’t necessarily more tornadic.”

Redmond is almost as interested in photography as he is in storms themselves and publishes awe-inspiring photos of Mother Nature on his personal weather blog.

“I really enjoy seeing a tornado and getting a good photo of a tornado, but in all honesty my true love in storm chasing is seeing the storm structure itself. To see one storm all by itself with no other clouds around it and maybe a sunset in there, that kind of thing ... it’s beauty of nature, and that’s what really drives me and makes me go out there,” he describes with a look of wonder as he crouches behind a row of high-speed and high-definition cameras mounted into the research van from which he and a team of School of Mines researchers observe lightning.

Officially, Redmond is president of the SDSM&T Weather Association, vice president of the Black Hills chapter of the American Meteorological Society, works as a fire meteorologist, and joins principal investigator and Professor Emeritus John Helsdon, PhD, doctoral student **Tom Warner** (MS ATM04), and others in a \$586,486 National Science Foundation-funded upward lightning research project.

Unofficially, he is a fearless storm chaser who is quick to point out that in no way does the university condone or support his off-time, thrill-seeking behaviors.

Storm chasing begins with forecasting and is most always followed by long periods of hurry-up-and-wait. And then the fun begins. Three essentials for an outing: A good map, a good spare tire, and bad gas-station food.

“You are really, really excited, but if you let that get the best of you you’re going to do something really, really stupid, and it’s easy to wreck out there, especially on the side roads,” Redmond warns. “And if you can’t control your emotions somewhat you’re not going to be a good storm chaser, and you are going to end up hurting yourself or someone else.”

Whether getting pelted by softball sized hail, 75 mph winds, or curtains of rain—or, often, all of the above at the same time—a sense of calm and street sense is key, he says.

A safe distance from a tornado is “your escape route. It’s not necessarily how close you are to the tornado but what routes you have to get away when you feel you are in danger,” Redmond explains. “So having a good road network is most important. Typical tornadic storms go to the north and east, although nature always has a mind of its own. And the tornadoes and the rotation portion of the storm usually move from southwest to northeast. Typically if you are east or south of a tornado you are going to be in the clear of the tornadic winds, hail, and heavy rains, so





View more of Christopher Redmond's storm photography at chip-redmond.blogspot.com and see Christopher Redmond's video interview at news.sdsmt.edu/hardrock/



Christopher Redmond spends hours “hurrying up and waiting” for lightning strikes and supercells. He shares his personal photos of Mother Nature’s wonder in a blog.

you want a road that can go south and east quickly should it change its course toward you.”

He’s learned from his mistakes—such as the time he ended up just far enough behind a tornado to drive into a path of destruction. “It kind of ruins your chase a little bit. But since then we’ve been ahead of the chase. The most recent tornado from June, that was probably the best forecasting and planning I’ve ever done in a storm chase. And we only went an hour from home with no radar, using just pure observation and meteorology knowledge.”

On his blog, Redmond called the June event at the South Dakota/Nebraska border “tornadofest” and posted a time-lapse of a basic, generic thunderstorm becoming super-cellular, meaning that it could sustain itself by creating its own environment.

“From there it underwent a tornadogenesis right after that time lapse. You can watch how just a basic cumulus cloud pretty much starts to get a rotational structure to it. You can tell something is going on and watch the rain curtains move. That was about an hour, hour-and-a-half before a tornado ever developed out of that storm,” Redmond describes.

As one might imagine, a storm chasing outing is best done as a team effort, and Redmond prefers to ride shotgun. “It’s kind of a personality thing. I enjoy telling someone where to go, and I like to capture it. I’m really big into photography, and it’s really hard to get the shots when you are driving.”

Exhilarating as it can be, the practical benefit is that storm chasers are the first warning system for communities who can better prepare. Redmond has also realized the need to become EMT certified so that he can serve in a first responder role, assisting people injured in storms.

His hobby goes hand-in-hand with his studies and is likely to continue as a side adventure. “It takes a lot of money, time. The problem with storm chasing is that it’s really hard to have a full-time

job and storm chase a good set up because it’s got to fall at a time when you can take a break from your personal life,” Redmond says.

With the meteorology job market slim, Redmond is making himself as marketable as possible, all the while doing everything he loves. He is also a fire meteorologist and lightning researcher.

Upward lightning occurs when the lightning initiates at the tip of tall towers, wind turbines, or antennas on city skyscrapers, for example, and travels back up into the heavens, often repeating the cycle many times over. Researchers are trying to determine what triggers the

continuous current and the exact dangers of it, such as exposing the surface object to more heat/charge which could potentially lead to a more destructive result.

The team forecasts the possibility of lightning developing in Rapid City each summer day and, when needed, dispatches the research van atop one of the city’s highest points in the southwest side of town, where it can monitor eight radio towers to the east at the same time. Of last summer’s observance of more than 200 lightning strikes only two were upward lightning.

A better understanding could ultimately increase human safety and protect property through construction improvement. The Mines research, which this summer will enter its second of three years, is one of just two such studies being conducted in the world.

Among their high-tech tools in the van alone are two high-speed cameras, one is 100,000 frames per second and the other is 10,000 frames per second, as well as two high-definition video cameras, laptops, radar, and, of course, GPS navigation/timestamping.

Between forecasting fire conditions on the scene of state and national wildfires and observing lightning, Redmond’s summers are busy.

What’s next on his meteorological to-do list? Chasing a hurricane. “Just once.”





Making Progress

MINES 2020: STRATEGIC VISION

Tim Crenshaw, an industrial engineering major from Antioch, California, is one of the first residents to call Rocker Square home. “It is exciting to be part of a community that is growing,” says Crenshaw, who in August moved into the new privately-owned student apartments next to the Surbeck Center.

He and his neighbors, roommates Josh Schley and Eric Beebe, are among the 121 students living in the new six story building, one which might not have been possible if not for strategic partnerships pursued by the School of Mines to accommodate the needs of its growing student body. In this case, the partner is Mines alumnus and businessman **Hani Shafai** (CE87), who razed a block full of blight and quickly erected the first of two privately-owned apartments for students.

Shafai also leases to the university a remodeled building at 520 Kansas City Street, which was officially opened this fall as the Downtown Campus, housing the Department of Industrial Engineering and offering an admissions presence and a number of conference rooms for public use.

Structural growth is but one example of the university moving ahead with Mines 2020: A Strategic Vision and Plan. The vision, formally adopted in the fall, outlines five strategies for the School

of Mines to follow in its pursuit to be recognized as a world-class technological university. Specially, one goal is to actively build partnerships. With Shafai and other alumni and business partners, the School of Mines is doing just that.

“I think it’s a great approach to use private industry talents to get things accomplished. Private industry is profit motivated and gets things accomplished in rapid fashion, economically,” says Mines alumnus **Jim Scull** (CE74) of Scull Construction, the contractor which built Rocker Square and is also involved in the new Newman Center being constructed on the same block next to campus.

Shafai says Mines is expanding and housing is a priority. Shafai has built partnerships with other alumni, such as Scull, and the university administration to bring quality projects in a timely fashion. The new apartments were built in five months, and a second Rocker Square building design is being finalized.

Determining and defining the priorities of the campus was Shafai’s first step. “I was aware of the need but I didn’t know how severe the need was,” says Shafai, who then worked to identify sources to satisfy and fulfill the building project.

The momentum for structural growth will only increase to accommodate a growing student population. Last fall the School of Mines experienced a 5 percent increase in its student headcount, which now sits at 2,424.

Between the 18,000-square-foot Downtown Campus facility and a development laboratory at 920 E. Saint Patrick Street, the School of Mines now leases more than 32,000 square feet in off-campus facilities. The South Dakota Board of Regents approved formation of a committee to develop a plan for a projected 120,000-square-foot research facility on campus.

The university is also moving ahead with plans to double recreation and field house facilities by building a new student wellness center. An architectural group has been meeting with campus constituencies and will present its plans to the Board of

Regents in April. The new center will increase the size of recreation facilities from the current 64,000 square feet in the King Center to as much as 144,000 square feet.

Partnerships will continue to be a common theme as the university moves forward. Collaborations with Rapid City Area Schools and other government entities are being pursued.

The continuing move west toward the downtown area will also be a focus in years to come, as the School of Mines looks for ways to connect with Rapid City’s economic development plans. A growing campus

has the ability to expose current students and their talents to the local business community. Likewise, it is hoped the community will continue to realize how much of an economic resource the School of Mines provides, building on joint business ventures with graduates. “The goal was to bring the school into the area so that we could create more interaction between the students and the community. Hopefully, we can retain some of the graduates to stay in the local market,” Shafai says.

Navigating around all the new construction can be tricky but is a good problem to have, agree roommates Schley and Beebe. The new build-



Roommates Eric Beebe, left, and Josh Schley were among the first residents of Rocker Square apartments. The Mines campus is enjoying a growth synergy, with the Downtown Campus (left) also officially opening during the fall 2012 semester.

ing growth alone is a great recruiting tool, says Schley, who chose Mines because of the then new Chemical and Biological Engineering/Chemistry Building. “Seeing my major housed in that brand new facility was really cool, and I saw myself there in the future.”

Mines 2020 charges the university to raise \$100 million from multiple sources to support the Campus Master Plan, and \$20 million annually to support operations, endowed professorships, fellowships, and scholarships. Other strategic priorities are increasing enrollment to 3,500 students; expanding research efforts by increasing awards to \$50 million and building a new research facility; investing in human capital by recruiting and retaining a diverse faculty and staff; and dedicating itself to continuous quality improvement.



Merle Crew, a 1942 graduate, holds the tattered flag that flew during the summer of 1940 in the School of Mines National Geographic Society-sponsored expedition to the Badlands.

DIGGING UP THE PAST WITH **Merle Crew**

GRAND JUNCTION, Colorado—At ninety-two, **Merle Crew** (Geol42) still has it.

It's nothing for this 1942 alumnus to log onto Google Earth and pinpoint the Badlands coordinates where he discovered what is believed to be the only complete skull of the predecessor to man's best friend—back when he was just fifteen.

"This is the little thing that is causing so much excitement," he says, cradling in his palm a cast of the tiny skull of a prehistoric dog. The excitement to which he refers is relative, of course, and was revived after Crew called Museum of Geology Associate Director Sally Shelton last fall to inquire about the fossil he donated about three-quarters of a century ago. "I figured if it wasn't important to them anymore, then I'd take it back."

But Shelton had a different idea. "It is one of our most important exhibit specimens. When I called Mr. Crew back and told him that the specimen was so important that it has never been off exhibit, he choked up. So did I," Shelton says. Since then paperwork has been drawn up and signed to formally deed the fossil to Badlands National Park and to the Museum.

Having grown up near Wall in a town that doesn't exist anymore, Crew remembers roaming the lands for fossils as a child on his family's ranch, which included some five acres of the Badlands. Then, the Badlands National Park did not quite exist. There were

no National Park Service policies prohibiting fossil excavation as there are today, and certainly no facilities to properly care for the treasures. Yet, even at fifteen, Crew says he instinctively knew that his was an important find and turned it over to the Museum of Geology at the South Dakota School of Mines & Technology for protection.

The fossil is rare and more valuable than a dinosaur find—which are "a dime a dozen," according to Crew—because it may be one of the only intact skulls of this prehistoric dog species. "Badlands fossils are critically important because they were well preserved in abundance over a very long time," Shelton says. "And they help us figure out the massive changes in climate, ecosystems, and creatures that have occurred here. But not everything was so well preserved. ... So this little fossil helps give us a glimpse into the ancestors of modern dogs."

The diminutive animal existed approximately thirty-seven million to thirty million years ago and was less than a foot long with a narrow skull, elongated body, and slightly shortened limbs, according to **Darrin Pagnac** (MS Paleo99), PhD, assistant professor in geology and geological engineering. Mines paleontologists, however, were able to determine that the animal was, indeed, a dog, through detailed examination of its teeth and regions of the back of the skull.



Now ninety-two, Merle Crew still has the 1947 National Geographic Society magazine which featured the university's Badlands expedition and a large photo of Crew piecing together a prehistoric pig's skull like a "scientific jigsaw puzzle."

Realizing he would be hard-pressed to make a living at his first love of paleontology, Crew went on to study geology at the School of Mines. But then, as he did decades later as a professional geologist for the Atomic Energy Commission and the Department of Energy (DOE), he always dabbled in paleontology. He eventually settled in Grand Junction, Colorado, where he retired as a DOE facility manager, and now resides in an assisted living facility with his wife of sixty years, JoAnn.

"Out here the only fossils you look for is dinosaurs. I've collected a few dinosaur fossils," says Crew, who used to trek out to the southwestern Colorado ridges about once a month in search of the earth's treasures. "Fossils teach you about evolution, really. You're learning about history and evolution, how the animals change. Some of these animals you find here might now be half way across the world. In the Badlands there were prehistoric horses that have three-toed hooves. There are also ancestral camels and rhinoceroses."

As a geology student at Mines, Crew worked in paleontology prep labs through a national youth subsidy government program making forty cents an hour. "I was still interested in working in the labs all the time."

Crew was invited to be a part of the School of Mines National Geographic Society-sponsored expedition to the Badlands in the summer of 1940. The seventeen-page *National Geographic*

magazine spread entitled "Big Game Hunting in the Land of Long Ago" that detailed the three-month expedition featured Crew in two photos, including a solo shot of him putting a giant pig skull back together as if it were a jigsaw puzzle. Because of war, the magazine didn't publish the spread until seven years later, in May 1947.

The group of about ten lived in tents on site, and spent their days sleuthing crevices and scaling ridges of a particular horizon that featured thick channel sandstone. "Most of the Badlands is fine-grade clay stone, but we concentrated in this channel system and the fossils ranged from prehistoric horses to pigs to rhinoceroses and many other species." Crew remembers the cook bringing supplies from Rapid City every weekend. The group had just two meals a day, breakfast and dinner at about four, taking only water for lunch so as not to interrupt their work.

Just about anything that was found on this horizon was excavated, including some big fossils that had to be skidded down steep slopes with ropes.

Though the expedition was important for the university because it brought national attention to the Museum of Geology, Crew doesn't remember specific findings, only that "we were always hauling out big fossils."

That's probably because none of his discoveries have ever been as important as the one at age fifteen.

A season for celebration and promise



Distinguished Alumni honored at the Fall 2012 commencement were, from left, Joseph Pekarek, John Sibert, Donn Lobdell, and Duane Huston. Also honored was Hwa-Young “Michael” Yeh.

Mines celebrated its 166th commencement December 15 as seventy students crossed the stage, eager to hold the fruits of their endeavors. In all, 101 degrees were awarded.

Commencement speaker Sen. **Craig Tieszen** (ChemE71) spoke about his commitment to others, an ethos sprung from his upbringing on a family farm in eastern South Dakota that would influence him throughout his life. After graduation, Tieszen joined the Peace Corps, teaching in Africa for four years before returning home to join the Rapid City Police Department, where he rose to the rank of police chief. Retiring from the RCPD, he turned to politics, and currently serves as a state legislator.

Five honored as Distinguished Alumni were:

- **Duane Huston** (ChE66), of Tucson, Arizona, consultant, inventor, and owner of SHEA Associates and JD Technologies, Inc. He has more than forty-two years of experience in the chemical industry in areas of project management, process engineering, and business development; holds several patents; and has been nominated for a Nobel Prize.
- **Donn Lobdell** (ME58), PhD, of Sunol, California, has created medical devices such as heart-lung machines, artificial kidneys, blood oxygenators, retinal and cataract surgery systems, filters for open heart surgery, and cell harvesting systems, and two medical device product development organizations at Cobe and Alcon Laboratories.

- **Joseph Pekarek** (EE88), PhD, of Manhattan Beach, California, served as a project leader at Hughes Aircraft Co. Radar Systems Group, developing advanced monolithic microwave integrated circuits for next generation radar systems. He is also the founder of AWR Corp., provider of a design platform for microwave/RF and systems circuits.

- **John Sibert** (Chem62, MS Chem64), PhD, of Malibu, California, a consultant in alternative energy, environmental technology, and economic development, who is also a Malibu city councilmember, and former mayor. He has held positions at Global Financial Group, Alaska Science & Technology Foundation, Caltech, and Yale.

- **Hwa-Young “Michael” Yeh** (MS Mtro76), PhD, of Potomac, Maryland, founder, chairman, and president of Caelum Research Corp., whose clients include NASA, the Food and Drug Administration, and the Department of Defense. He has also served as founder, past president, and CEO of Deus Technologies, LLC, a commercial products development and distribution company.

Ariel Granillo (IE12), of Chandler, Arizona, delivered the senior class representative’s message. An industrial engineering and engineering management major with a minor in occupational health and safety, Granillo, was a student-athlete and Mines Leadership Hall of Fame inductee, as well as an active member on the Mines campus and in the Rapid City community.

1930s

Emile “Bud” Belzer (CE34) and Irene celebrated their 75th wedding anniversary on Saturday, June 16, 2012, at Westhills South in Rapid City with family and friends.

MEMORIALS

Edgar R. Lang (ChE36)

W. Plummer “Paul” Wells (ChE38)

1940s

Lloyd Darnall (CE44) and Maxine celebrated their 65th wedding anniversary on October 6, 2012, with an open house at the Methodist Church Community Life Center. They had a great time. He remains occupied one day a week building houses for Habitat for Humanity, which is completing its fiftieth house in Brookings County since 1996. He helped **Harlan Meyer** (CE44) celebrate his 90th birthday in September in Sioux Falls.

Armand Segeley (CE49) feels fortunate to have good health at his age.



Don Dittman and family visiting the Alumni Association office.

Donald Dittman (ChE42) turned 93 in January 2013 and had been in good health until he was hospitalized in July for an aneurysm operation. He had been in the Black Hills just before going into the hospital. He is hoping to be well enough to come back to Rapid City next summer again. He also gets to Florida every winter.

Robert Winkler (CE43) and Kathy, his wife, are full time Florida residents. Travel is difficult. He turned 90 in May and has been retired for 30 years. Son, Jim, and his wife, Karen, whom they had not seen in 15 years, recently visited from San Diego, California.

Christ Woods (CE48) just returned from Southern Illinois, where he visited his new great grandson. He also has a new great granddaughter, bringing the total of great grandchildren to four. He and Alice are doing fine and send their best regards.

Richard “Dick” P. Young (CE48) now has 20 grandchildren and seven great grandchildren.

MEMORIALS

William R. Benn (ChE44)

Perry “Pat” E. Goth (ChE44)

Robert A. Johnson (Chem45)

Harold F. McDonald (CE49)

Jack E. Nelson (MetE47)

James T. Rudesill (Chem48)

Ernest F. Schmidt (EE49)

John “Jack” L. Shedd (GenE42)

Wilbert E. Warnke (MetE40)

1950s

Bill Benda (EE57) continues trying to break 100 on the 18-hole golf range.

John Burggraff (ME58) is enjoying retirement and keeping busy.

Carl Buttemeier (EE59) is well and staying busy consulting with B/E Aerospace, which is building a trash compactor for the airlines. He is doing the failure mode effect analysis. His daughter, Debbie, traveled to California for his 50th wedding anniversary.

John Garrison (CE51) recently returned from a trip to southwest Virginia with his wife, Jan, to see the fall foliage. While there they made several short walking trips on the Appalachian Trail and other trails. They made a 17-mile bike trip down a mountain, which provided shuttle service to the top. Life has been good to them, he says.

Warren Dowler (ChE56) retired at age 82 after healing from several surgeries. He feels great and is still working on several projects. He had a wonderful career in the development of several technologies for the military and

NASA space program at the Cal Tech Jet Propulsion Laboratory and Stanford Research Institute at its Calaveras test site. He is now consulting part-time on Solid Propellant Rocket Motor current and historic technology. He moved last year to an acre of high desert at Parhump, Nevada, where there is plenty of water for his well and clear, star-filled skies at night. Las Vegas is about 60 miles to the east for a touch of big city needs, day or night. He is now a snow bird with a second residence on the Pacific Coast in Brookings, Oregon.

Fred Gerdes (GenE51) moved to Grand Haven Retirement Community. It is nice and fits the need at this time. They still feel De Witt, Iowa, is their home. Their family is close, and he and Doris remain in fairly good health. They often think about all the good times they have had at Mines.

Harold Hanson (EE53) has been a widower for nine months at the time of writing and is ready to celebrate his 84th birthday. He continues to take out his RV, camp, square dance, and is active in his church.

Roy Kepferle (Geol54) believes the SDSM&T Geology Department in 1953–1954 was pivotal in opening possibilities that led him to an enjoyable lifelong career. He sends special thanks to Dr. Paul Gries and Ed Tullis for their encouragement.

Richard “Dick” Larson (EE54) is living in an Alzheimer care facility and is unable to continue keeping in touch. His wife, Patsy, notified the Alumni Association.

Larry Paschal (GeolE57) and wife, Sylvia, lost their daughter, Penny Ann Paschal, in 2006 and have not fully recovered. Their son is an industrial engineer with Goodyear Tire in North Carolina.

Bill Tucker (GeolE56) remembers **Maurie Fuerstenau** (MetE55) as being an outstanding student and having an equally distinguished career and success in many areas. He says SDSM&T can be proud of the record established by people such as Maurie Fuerstenau.

Richard Maki (MetE59) splits his time between Sun City, Arizona, and Hibbing, Minnesota.

Jim Richardson (Chem52) and Eileen are doing well, and have been in the same house for 51 years. They are looking forward to their 60th wedding anniversary in December. They often see their children and grandchildren, even though they are scattered throughout the northeastern United States.

Thomas White (GenE59) and wife, Elaine, are well. They missed the 2009 50-year reunion as Elaine was not able to make the trip. She is fully recovered now, and they are looking forward to the 2015 reunion. He is still subbing K-12 in Mesa, Gilbert, and Apache Junction, Arizona, during winter months. They enjoy Ohio and Kentucky the rest of the year.

MEMORIALS

William R. Bohannon (ME52)

Donald L. Egge (CE52)

James R. Erickson (CE58)

Phillip J. Fenner (EE58)

Donald A. Freeland (EE59)

Maurice C. Fuerstenau (MetE55)

Charles D. James (ME51)

Kenneth M. Martin (ME58)

Patrick L. McDonald (ME58)

Edward McKendry (CE56)

Neil B. Nerison (ME58)

Lennis F. Shafranek (ChE51)

Sherrill G. Swenson (MetE56)

Rudolph L. Trygstad (EE59)

Joseph V. Truhe, Sr. (EE56)

Donald K. Turner (EE50)

1960s

Pete Aberle (GeolE61) emailed that **Chuck Maciejewski** (MetE62) passed away in California on April 27, 2012, and that his wife, Mary Frances, passed away on April 25, 2012, after 53 years of marriage and four children. He plans to remain in Lakewood, Colorado.

Jon Anderson (ME60) reported that he and Billie are happily retired and split their time between Arizona and Washington.

Theodore Andrews (CE62) and his wife, Louise, are looking forward to their 90th birthdays in early 2013. They are enjoying more than 68 years of marriage, and are active in their church. He continues to golf and bowl weekly. Louise keeps busy with her computerized embroidery and Internet contact with their three daughters. They are thankful for their health.

CLASS NOTES

Sam Begeman (ME64) expressed that he was shocked at the death of SDSM&T President Wharton. All is well in Kerrville, Texas, and he does occasionally get out for sightseeing trips to Florida, Seattle, Vancouver, Oregon, California, South Dakota, and most recently a river trip in France.

Paul Besselievre (EE64) and wife, Carol, celebrated their 50th anniversary. They put 22,800 miles on their car and traveled 36 states. They saw many brothers, **Ivan Montgomery** (EE63), **Robert Zofft** (ME63), **Robert Stofft** (CE62), **Mil Peterson** (CE61), **Richard Lauritsen** (GeolE62), **Bill Sheldon** (CE62), **Tom Snyder** (ME62), and **Odean Jukam** (ME62).

Larry Blair (CE61) and Kathleen took a 5,000 mile RV trip in May to the great Pacific Northwest, via Utah, Idaho, California, Oregon, and Washington. They spent a couple of days with Edie and **Bob Pederson** (ME60). They visited some of their “bucket list” sites while on their adventure, including Yosemite, Redwood National Forest, Coastal Highways, and California Central Valley. Larry said it was a great trip.

Alfred Broz (MS Phys68) thinks it is time to retire. There were no major transport incidents in over a decade, and some of that is due to programs initiated by him through the FAA.

Richard “Dick” Chambers (ME66) has been a mechanical engineering mentor for a high school F.I.R.S.T. team in Lancaster, California, (Team 399, Eagle Robotics) for 13 years.

Sidney Clark (CE61) and wife, Susan, celebrated their 50th wedding anniversary in June 2011. They have five grandchildren, ranging from teen-agers down to a 1-year-old. Sidney is semi-retired now, and life is good.

Carl Coad (Math60) is enjoying retired life in Kansas. Latest tests show that he is cancer-free following treatments for prostate cancer. His area is suffering from drought conditions, as are many Midwest areas.

Glenn French (ME68) says that with the passing of his father in September, he and his sisters decided to sell the farm before the inheritance tax laws changed. Among other challenges, Glenn was forced to apply for early Social Security retirement

benefits. He wishes other alumni well, and hopes to hear from former students and alumni he had gotten to know throughout his several stints at SDSM&T.

Juke Jukam (ME62) says thank you for the time and effort to organize the graduation reunion for the class of 1962. He looked forward to this event for some time. He noted that while on campus students had different interests and agendas, but during the graduation weekend all were “just Miners.” He looks forward the 75th.

Bashir Master (ME67) is actively involved with the engineering and project management of solar power projects and resource recovery power generation facilities. His wife, Barbara, continues to manage her practice as a holistic health coach. Bashir and Barbara have five children and five grandchildren. Their children are engaged in various fields including: medicine, law, banking, education, and marketing.

Dan Matthaidess (ME63) and Bonnie celebrated 50 years of marriage. Both continue to keep active with several volunteer organizations.

Richard Moen (MetE62), his wife, Mary Jo, and brother-in-law, **Dale Bridenbaugh** (ME53), enjoyed the reunion of 1962. He said it was great to reconnect with classmates. The hospitality exhibited by all at Mines was appreciated, making for a worthwhile trip.

Roger Roehl (ChE66) continues to enjoy retirement. He and his wife, Myrna, spend their winters in Florida and their summers in Michigan when they are not on building projects with their church group. This past summer was a challenge for Roger with radiation and chemo treatments for cancer. With his treatment complete, he is now working on regaining energy and weight. He recently met up with **Dave Wengert** (ChE63). He retired from Dow Corning and now lives in Midland, Michigan. Roger is looking forward to going to Florida and having a great 2013 working on his golf game.

Jerry Pekarek (ChE66) continues to enjoy New Mexico. He spends his time hiking and doing volunteer work, maintaining trails and picnic areas. He and Judy spent August in Washington with their family.

Carol Reed (Geol66) is enjoying retirement in Rapid City. He started a part time job a little over a year ago working for the Minnilusa Pioneer Museum at the Journey Museum. He recently received the title of curator/archivist for the museum.

K. Delmar Rumph (GeolE68) continues to enjoy the busy pace of retirement, filled with things like travel, babysitting of their eight (soon to be nine) grandchildren, golf, and adult education classes to keep their minds stimulated. The big trip this year for him and Jan was 22 days in China and Tibet. The trip left them feeling much more appreciative of the freedoms experienced in the United States.

Jon Lehner (Math64) moved back to the Black Hills after six years in Iowa. He and Judy missed the area.

Tom Snyder (ME62) enjoyed the Class of 1962 50-year reunion in May. He encourages all alumni classes to attend their 50th reunions. The campus tour, interaction with current students, and participation in the spring commencement exercises was a rewarding and enlightening experience for him.

Walter Sutherland (GeolE60) congratulates SDSM&T on the *Bloomberg* article. In relation to that article, he shared that his starting salary in June of 1960 was \$6,420 per year and his ending salary 39 years later was well into six figures.

John Synhorst (EE68) moved to California in retirement to be closer to children in the San Francisco Bay area. He said retirement is busy with the move and fixing up a new house, plus cleaning and sorting through years of items.

Brian Tucholke (Geol68) and wife, Anita, enjoyed a trip to Eastern Europe in September, including 10 days down the Danube from Germany to Bulgaria. They now have three granddaughters, ages 7 months to nearly 3 years.

Duane Utecht (CE68) is working his way into retirement. He worked about half time in the beginning of the year and about one quarter of the time in the last few months. He is still doing work associated with risk assessments of sites that manage waste for generators. He managed two trips to Europe this past year, for a godson's wedding

in England and also with some family members in Italy. There seems more than enough things to fill the days even though he is retired. His sentiments are that perhaps that is the way it should be.

Tim Taylor (Chem63) and wife, Wendy, celebrated their 50th wedding anniversary in November 2012.

MEMORIALS

Larry E. Beckwith (ME66)

Karl T. Blaufuss (CE62)

William C. Brengle (CE63)

James W. Clack (ME60)

Robert R. Koenig, Sr. (EE64)

Frank C. "Chuck" Maciejewski (MetE62)

Gary A. Olsen (ChE68)

Vernon E. Paul (EE63)

David A. Watters (CE60)

1970s

Kathy Ammon (Math70) loves Arizona. She is finally using her math degree mentoring students at the middle school.

Greg Apa (CE79) has been living in Hawaii since 2003. His family is doing well.

Scott Barber (ChE71) and brother, **Dave** (ME66), appreciated personal tours of the Surbeck Center and mechanical engineering department. They were impressed by the new Chemical and Biological Engineering/Chemistry Building. **Doug Aldrich** (ChE62), who made many contributions to the design of this building, offered Scott a job interview at Dow Corning when he graduated. Scott subsequently worked with Doug at Dow Corning for 30 years before retiring in 2001. He lived in Sao Paulo, Brazil, for four years and in Hong Kong for five. Both Scott and Dave found degrees from SDSM&T highly regarded and valuable assets in their respective careers at Dow Corning and United Technologies/Hamilton Standard, respectively.

Eung Ha Cho (MetE75) retired two years ago after teaching for 32 years at West Virginia University.

Dan Colgan (CE74) retired from Ellsworth AFB in August of this year after more than 25 years as a construction manager.

CLASS NOTES



From left: Anita Freeman (EE76), Carmen Adams (ChE75), Mary Halling Kennon (Ex71), Susie Jorgensen (CE76), Kathy Miller (Chem74), Linda Rausch (ChE75), and Susan "Booty" Banks (GeolE75)

Susan "Booty" Banks (GeolE75) sent a photo of the School of Mines "gal pals" at Glacier National Park. They had a great time, as always, and try to get together at least once per year and definitely at the five-year reunions.



From left: Paul Gnirk, Larry and Linda Pearson, Bonnie and Dave Berg, Tom Zeller (photo by Sharon Zeller)

Bonnie and **David Berg** (ME73) opened their home and dining room table for Alumni Executive VP **Paul Gnirk** (Mine59) and fellow Men of Omega **Larry Pearson** (ME72) and **Tom Zeller** (ME70). A good time was had by all.

David Berrien (EE75) remains employed at Seagate Technology in Shakopee, Minnesota, and celebrated his 35th anniversary with Seagate in March. His wife Diane works for Ceridian, a payroll services company. Their daughter, Nicole, is in her sophomore year at the University of Minnesota. They just returned from a visit with his brother, **Dennis** (Chem73), in late October. Dennis recently retired from his farm/ranch operation near Harrold, South Dakota. They are hoping to visit again during the holiday season.

Karl Gerdes (ChE71) pulled out of the fast lane soon and, beginning July 1, 2012, started to work part time. His wife, Pam, retired on June 1, 2012.

Steven Cooper (EE77) retired after 30 years of government service as a federal civil servant, and accepted a position with CACI. He is currently providing engineering advice and assistance to the Army Communication Electronics Command Security Assistance Management Directorate (SAMD). He and Melany are happy in their new home since 2009.

Terry Fiero (ChE70) updated that he and Pam are blessed to live near their girls, Tina and Tracy, and their families in the Columbus, Ohio, area. They continue to enjoy retirement, and spend time gardening, golfing, travel, and attending their grandchildren's sports and activities. They are already looking forward to the next reunion in 2015.

Dick Glover (ME73) works in the government contracting business supporting the military with the latest innovations in ordinance technology. He plans to continue to work until the boys are out of college but looks forward to retirement and time alone with Marianne. Sons, Matt and Sam, just finished their freshman year at San Jose State University in California.

Arne Hatlestad (EE73) retired on August 31, 2012, and is planning to travel over the next few years.

Joel Grace (MinE73) just moved from West Jordan, Utah, after working for Kennecott Utah Copper on its Cornerstone expansion; and is still operating under the Grace Consulting Services, Inc. banner but is considering retirement. They now have four granddaughters ages 1 to 7, two in Greeley, Colorado, and two in Hastings, Nebraska. They love to visit them.

Joan Howard (Phys76) stopped by the Alumni office this past fall. She is retired and living in Hot Springs, South Dakota. Most of her career was in infrared sensors, working for Department of Defense and NASA through Hughes, Loral, and Ball Aerospace. Two of the more interesting were: Wide-field Infrared Survey Explorer, which is a small satellite built to survey the universe in 4 IR channels. It mapped Ultra luminous galaxies, Brown Dwarfs, and asteroids. She was the program manager for the spacecraft and was on the program from inception; and Ozone Mapping and Profiler Suite, where a pair of spectrometers was deployed on the next generation of low earth orbiting weather satellites. This NASA/NOAA project is part of the complex weather and climate satellite instrument suite. She

was the program manager on this project before she retired.

Rob Howe (EE72) retired from John Deere after 33 years. He and Evie moved back to South Dakota from Iowa. They are looking forward to retirement and new found freedoms that come with it. With six children and 19 grandchildren, they will be busy.

Jim Mackay (GeolE75) sold his main business May 1, 2012, and is now retired. Traveling is on his agenda.

Ritch Larsen (ME75) is enjoying 2012 in China.

Jeff Ingerson (ME75) retired from Questar Exploration and Production in the fall of 2010. He stayed retired for six months when Chesapeake Energy made an offer he could not refuse. He and Jan moved to Oklahoma in June 2011. He is working as a manager of Corporate Air Permitting.

Patricia Knox (ChE76) graduated with a PhD in natural medicine in October 2011 from the International Quantum University of Integrative Medicine. She and **David Knox** (ME75) now have

two grandsons, Asher, born in November 2010, and Kai, born in July 2012. They currently reside in Jubail, Saudi Arabia, where David is in his 37th year of working for Phillips/Chevron, Phillips Chemical Co. LP.

Dale Larsen (GeolE78) is living and working in the Denver area in oil and gas operations. He sees **Terry Logan** (GeolE78) frequently.

Wayne Larsen (GeolE76) and wife, **Margaret** (MetE77), have become first-time grandparents. Archer Larsen was born on June 25, 2012, to their son and daughter-in-law, Jessica.



From left: Reah Dahl-Stamnes, Marlene Nelson, Bob Miesen, Mary Jane Green
Past Alumni President **Marlene Nelson** (ME74) sent a photo from an impromptu gathering with Past President **Bob Miesen** (CE61), **Mary Jane Green** (CE78), and **Reah (Graham) Dahl-Stamnes** (CE81) in San Antonio, Texas.

CLASS NOTES

Curt Olson (ME74) joined OCI Chemical in Green River, Wyoming, as a reliability engineer after Archer Daniels Midland closed its ethanol plant in Walhalla, North Dakota. He joins **Mike Hohn** (MinE85), **Jeremy Spicer** (ChE93), **Scott Leffers** (EE89), and several other Mines alumni.

Don Wiedemer (ME72) has retired from the Stanley County Assessor's Office. He and wife Melinda purchased a home south of Deadwood in Galena. When they sell their home in Pierre they will move to the Black Hills.

Harry Schunneman (ME74) owns Monarch Pools, Inc. and Mr. Fender Body Shop in Houston, Texas. He is currently involved in residential and commercial pool construction, service, and renovation. Harry and his wife are "empty nesters" and all four of their children reside in the Houston area. He has taken up flying as a hobby. He and his wife have a second home in Spearfish and enjoy visiting often to escape the Texas heat.

David Story (EE76) is working less and enjoying the family more.

Linda Pirtle's (ChE79) youngest son will be a sophomore at Texas A&M-Galveston. After years of Scouts, band and tennis, Pirtle and her husband are working to uncover what they like to do.

Kip Squire (CE78) and Deb are still in Omaha, Nebraska, where Kip is a principal in the firm of Thompson Dreesen Dorner (TD2). TD2 provides structural and civil engineering services, land surveying, and recently opened an office in Sioux Falls. Kip enjoys fishing and getting back to South Dakota for pheasant hunting. Kip and Deb have three daughters. Katie was married in August and is a nurse practitioner in women's health. Mandy is also married and a nurse practitioner in pediatric oncology, and Annie is in her final year of occupational therapy.

Ron Symens (EE73) and Kathy are traveling in an RV about seven to nine months each year. They keep a home in the Akron, Ohio, area, but changed their residency back to South Dakota. He continues to work on product development, administrative duties, and marketing guidance for the company they owned for many years. It is a convenient arrangement, as it can be done remotely via the Internet.

Joe Vig (CE71) has been appointed chairman of the Manufacturers & Services Division of the National Stone, Sand and Gravel Association (NSSGA). Vig said, "I hope that during my term as chairman, I can bring enthusiasm and knowledge to help the association continue its mission of serving the men and women of the aggregate industry."

MEMORIALS

Terrance J. Coughlin (ChE70)

James K. Leander (CE71)

1980s

Reah (Graham) **Dahl-Stamnes** (CE81) enjoyed another summer in Austin, Texas, last year. Their daughter is a senior at Trinity University. She swims three times a week and keeps busy within the community. She is looking forward to a trip to the Black Hills.

Frances Alexander's (MinE81) husband, **Tom** (MinE81), is joining the V+ Development Solutions Division of Southwestern Energy Company (SWN) as vice president, Health, Safety & Environmental (HSE), leading the HSE function across the entire company. Tom joined

SWN in 1998, was a leader in the Fayetteville Shale discovery team, and was responsible for the completion of up to 450 horizontal wells per year. Tom has led SWN's entry into New Brunswick, Canada, as General Manager for the last two years. Tom served his country as a member of the U.S. Air Force where he was a navigator and radar navigator in the Strategic Air Command, flying a B-52H. He was honorably discharged with the rank of captain. Tom and Frances live in Kingwood, Texas.

Jay Cass (CE88) finished the first year of his second tenure as a senior engineer with the California Regional Water Board, Lahontan Regional (the Great Basin of California) for a total of 25 years at the agency. Daughter Stephanie graduated from UNLV as an architect, and daughter Deandra is at UC-Davis in Environmental Policy.

Vivien (Pappel) Greni (ME88) recently attended the wedding of her daughter, Katie, who married, Brian Mueller. Her business, Midland Scientific, continues to do well.

Ron Dolin (ME83) and wife, Olha, opened Don Quixote Spirits, the first legal distillery in New Mexico history. He built his first solar-powered still while he was a student at SDSM&T. Years later he moved to Los Alamos and currently is an engineer at Los Alamos National Laboratory. He uncovered one of the first recipes for a fortified wine called Angelica that was created by Spanish missionaries in 1648.

Mary Himmler (Chem88) and family extend prayers and blessings to Dr. Wharton's family.

Jon Christopherson (EE84) wrote to compliment the alumni staff. "Thanks for keeping us up-to-date with the happenings at Tech in your weekly E-News messages. It is good to know that the school continues to get fine students and see their impressive achievements."

Kyle Hoops (EE84) moved from the fossil plant in Green Bay, Wisconsin, to the regulated gas utility, Peoples Gas, in Chicago, Illinois. He is the general manager of the North Dakota District and gets to see fellow alumnus, **Roger McCambridge** (ME77) more often.

Troy Fierro (MinE85) has been appointed to the Board of Directors of Gold Canyon Resources Inc.

Mark Rantapaa (GeolE87) recently moved to Barrick Cortez mine as the manager of the open pit after 20 years at Barrick's Goldstrike mine. He enjoys Elko, Nevada.

David Omdahl (CE82) was recently elected as a South Dakota state senator for District 11. He would like to encourage companies to explore and develop energy resources such as oil, gas, and uranium in the state. SDSM&T has graduated some of the best and brightest engineers and scientists who currently work or have worked in the energy fields involving exploration and production. He is seeking input from fellow alumni on how South Dakota's energy resources can be developed. Please email him: omdahlforstatesenate@gmail.com.

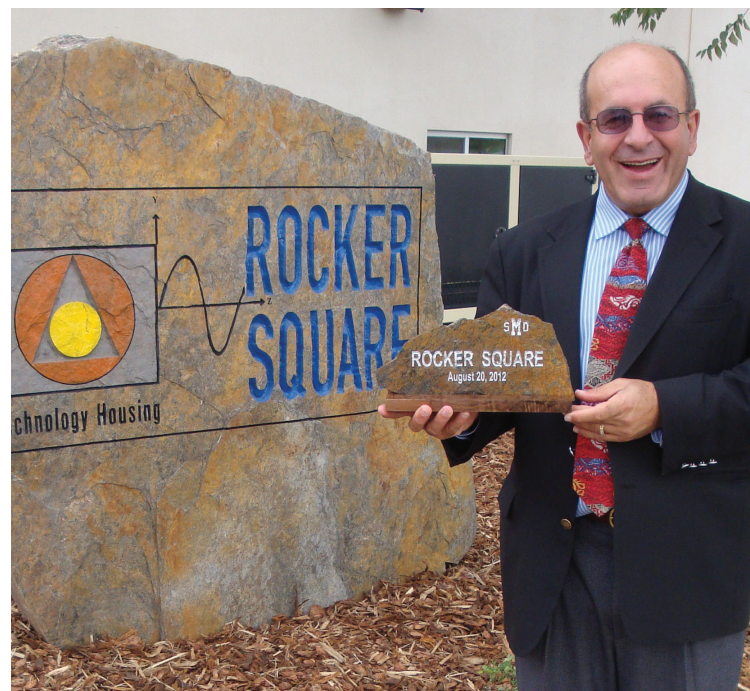
Charles Logan (MinE83) was relieved on September 21, 2012, as commander of Submarine Squadron 19, which includes responsibility for two guided missile submarines—USS Ohio and USS Michigan—as well as

two strategic ballistic missile submarines—USS Pennsylvania and USS Kentucky. All are based in Bangor, Washington.

Francis Schaffer (ME83) has expanded his business into tile drainage design/installation. He works with other alumni in the area, **Ron Baruth** (MinE72), **Larry Baruth** (ME66), **Jerry Schley** (ME73), **Ron Bowar**

(CE79) and **Tim Bowar** (EE81). He has adopted six children.

Karen Stoner-Wagner (GeolE81) wrote that their daughter, Ellen, is in the chemical engineering graduate program at the University of Texas-Austin and their son, Paul, is attending Gillette College for its diesel mechanic program.



Hani Shafai (CE87) at the grand opening of Rocker Square apartments.

Developer/alumnus **Hani Shafai** (CE87) was thanked for his efforts at the ribbon-cutting of Rocker Square, the privately-owned apartments across Birch Street from the Surbeck Center, with a plaque from the Alumni Association. The six-story building, which houses 121 people, is comprised of thirty-four two-, three- and four-bedroom units. Owned and managed by Technology Housing, LLC, the apartments are full with Mines students this fall. For more information on the apartment, please visit the rockersquare.com webpage.

CLASS NOTES

MEMORIALS

Richard J. Palmquist (ME82)

Bradford P. Swanson (ME82)

1990s

Marty Drefs (ME92) works at Accenture, managing a portfolio of software products for the travel industry. He has the opportunity to travel the world, and in the last few months he has been to Brazil, Singapore, Indonesia, Hong Kong, and China. He and Kat enjoy living in the Twin Cities. Their twins have finished the fourth grade and keep the household in constant motion with their school and sports activities. Kat works part-time as a physical therapist and teaches Pilates at their home.

Karen Hall (ChE91) published a thriller set in Lead/Deadwood. *Through Dark Spaces* (Karen Hall Books, May 2012) features a strong female protagonist, Hannah Morrison, a young environmental engineer who uncovers evidence that groundwater in the Black Hills is being poisoned. *Through Dark Spaces* follows Hall's 2006 release, *Unreasonable Risk*, a thriller about sabotage in an oil refinery. Hall is currently working on a standalone novel,

but will soon begin work on a sequel to *Through Dark Spaces*. She is president of the Black Hills Writers Group and a member of the Pennington County Planning Commission. She was an active member of the committee that wrote the county's septic system inspection ordinance. Hall and her husband, **Jeff Nelsen** (ME91), president of the Rapid City Area Schools board, have lived in Rapid City since 2002.

David Muck (CE94) and **John Van Beek** (CE98) became owners of Ferber Engineering Company in June 2012. They employ 14, six of whom are SDSM&T graduates.

Jeff Oligmueller (ME93) completed his MBA from the University of Iowa Tippie School of Management in December 2011.

Curt Nesbitt (EE93) works at Missouri River Energy Services, Sioux Falls. Carol, his wife, works for Sioux Falls Catholic Schools as alumni director and director of community relations. His daughter, Annie, married Chance McMillan in April. They have a 4-year-old-son, Ollie McMillan. Their oldest son, Joe Nesbitt, is a recent graduate of the University of St. Thomas, and now works at 3M in St. Paul. Son, Sam, 16, attends O'Gorman High School, and son, Aaron, 13, attends O'Gorman Junior High School.

Eve Norton's (Math91) husband, Gary, works for Schemmer Associates. Eve went back to school to get her teaching certificate and master's degree in secondary education from the University of Nebraska at Omaha. She teaches sixth-grade math and loves it. Their daughter, Andrea, is a freshman at the University of Nebraska in Lincoln. Their daughter, Allison, is a high school freshman and their son, Russell, is in seventh grade.



From left: Alumni firefighters Gail Schmidt, Chris Jolley, Tami Stadel

Firefighters **Gail Schmidt** (CSc92), **Chris Jolley** (IS93), and **Tami Stadel** (ME06) wait for a park ranger to lead them into a rescue in the Keystone area.

Dawn Recker (Chem98) bought a house in Marion, Iowa, in August. She feels fortunate to have a place of her own and looks forward to playing in the dirt, growing a garden, flower beds, etc. The pharmacist opportunity at St. Luke's Hospital in Cedar Rapids has been great. She was there a year on December 19 and looks forward to many more years to come.

MEMORIALS

Olin B. King (Hon90)

2000s

Chris Baer (CE01) was welcomed to the Kolberg-Pioneer, Inc. engineering team. As a structural design engineer, Baer will perform structural steel design for both the Washing and Material Handling product lines.

Michael "Gravy" Grave (ME09) quit the resort and is only working number one job. He moved into a house and enjoys having personal space and free time. His boat goes in the water the first week of June, when he starts living there on the weekends.



ABOVE: The Tullis family

Alumni **Mariam "Grenz" Tullis** (CE02), **David Tullis** (CE01), and children, Ada and Michael, visited SDSM&T in September 2012 to pick up their champion concrete canoe that has been hanging in the canoe lab since 2002.



From left: Corinne Heiberger, Coda, Breanne Lundin, Elijah and Kevin Heiberger

Sisters **Corinne** (Vottero) **Heiberger** (IE08) and **Breanne** (Vottero) **Lundin** (ChE06) hiked M Hill last summer with fellow alumni **Kevin Heiberger** (ME07), **Tim Vottero** (Chem84), future Hardrocker **Elijah Heiberger**, and Coda.

Chris Dougherty (IE04) was hired by Phoenix International, a John Deere Co. in Fargo, North Dakota, as an industrial engineer.

Joshua Valder (GeoGE07) was married to Megan Coats on June 30, 2012.

Charles Gwynn (IS07) remains in the Army after five years. Currently he is serving as a communications planner in the 1st Calvary Division at Fort Hood, Texas. He recently returned from his second tour in Iraq.

Mindy Haerer (IS03) and Kelly Jones welcomed a baby girl, Emmalyn Darcy Jones, on June 30, 2012.

2010s

Joel Lankutis (EE10) was married to Kristin Whitford on July 21, 2012

Zachary Marcus (MinE10) was married to **Tiara Mueller** (IE11) on June 16, 2012

Former Faculty and Friends

When Roger Holthaus (former faculty) taught Government & International Relations at SDSM&T from 1966-1969, Senator George McGovern, who passed away in October 2012, was frequently his guest speaker. Holthaus was in Omaha, visited with McGovern, and the senator recalled speaking to Holthaus' class in the past. Holthaus also writes that SDSM&T President Harvey Fraser had Frank Borman speak on campus about his journey to the moon.

MEMORIALS

J. Haworth "Howie" Jonte

AREA MEETINGS



1. 2012 M Week senior plaque installation by CEE students: (l to r) Kirk Ehlke, Canova; **Tony Kulesa** (CEE12), Aberdeen; and Cole Bedford, Sturgis

2. 2012 M Week 100th anniversary plaque installation by CEE students: (l to r) **Tony Kulesa** (CEE12), Aberdeen; Ben Wolf, Gering; Kirk Ehlke, Canova; and Cole Bedford, Sturgis



3. 2012 M Week students celebrate the 2012-13 senior plaque.

4. 2012 M Week student work crew assemble 100th anniversary sign atop the "M".

5. 2012 M Week gathering at ramp B-67

6. 2012 M Week : **Mike Langerman** (ME72), head of the Department of Mechanical Engineering, takes one for a good cause, to raise money for the Student Emergency Fund.



7. 2012 M Week gathering at ramp B-67 during M-Day

8. 2012 M Week Thirsty's event

9. 2012 M Week Thirsty's event

10. 2012 M Week King Carlos Beatty Jr., an industrial engineering major from Honolulu, HI, and Queen Megan Mahowald, an electrical engineering major from Bismarck, ND, atop the "M" awaiting whitewash

11. 2012 M Week parade marshals **Jim Green** (ME74) and **Connie Green**

12. 2012 M Week parade Hardrock Cheerleaders with **Paul Gnirk** (MinE59) and **Mike Langerman** (ME72)

13. 2012 M Week SAC golf tourney team "Off Constantly" winners: (l to r) Brandon Andrean, Justin Brick, Jonathon Zacher



AREA MEETINGS



14



15



16



17



18

14. 2012 M Day muster in Wiltshire, England: **Nancy Ward Dunham** (EE57), **George Dunham** (ME56), **Jim Ward** (EE49), and **Les Larson** (CE58)

15. Carlsbad, NM Waste Isolation Pilot Plant (WIPP) Tour: 10 ASCE students visited a 2,100-foot deep salt mine, a repository for transuranic waste, which has operated safely since 2001, hosted by SDSM&T alumnus **Dr. Frank Hansen** (CE73) of Sandia National Laboratories. Pictured (back row) Dr. Bora Cetin (CEE faculty) students Erik Vik, Kirk Ehlke, **Tony Kulesa** (CEE12), Ben Wolf, Michael Dollarhide, Brian Ruppelt; and (front row) Kristen Markham, **Dr. Frank Hansen** (CE73), Kody Heller, **Dr. M.R. Hansen** (CE69), Barbara Hansen, Elizabeth Kreher, Cole Bedford, and Chris Timm

16. 2012 M Day muster in Mitchell, SD: **Keith Beck** (EE90), **Kevin Erdmann** (ME04), **Danielle (Marquardt) Erdmann** (Geol05), **Rick Ames** (ME90), **Matt Carda** (IS99)

17. Alumni and friends at Rockies game in Denver, CO

18. Norfolk, NE Nucor Industrial Tour: 23 students participated from MetE, ME, IE, and EE. Hosted by SDSM&T alumni/Nucor teammates: (in orange) **J.D. Russo** (MetE10), **Jonathan Straetker** (MetE12), **Blake Werning** (MetE09), **Terry Rasmussen** (MetE91), **Clay Hammock** (CEng10); also alumnus/professor (second from right) **Dr. Jon Kellar** (MetE84)

19. Houston, TX gathering of Hardrockers working for LyondellBasell and flying the Hardrocker flag. Pictured: (l to r) Claudia Muci, Nathan Eitrheim, Valeria Duran, Janelle Strampe, **Rose Luvaas** (ChE08), **Kevin Morrow** (ME11), **Karen Swindler** (ChE88), Benjamin Ruege, **Dustin Kohler** (ChE11), Michelle Kelley, **Andrew Kelley** (MetE11); alumni not pictured: **Cassandra Brenner** (EnvE11), **Ryan Ziegler** (ChE11), **Teneil Dollarhide** (MetE11), **Chris Dollarhide** (ChE12)



20. Mongolia dinner: (back row, l to r) Mandakh, Batbaatar, Otgonbileg, Battsengel, Sugar, Uyanga; and (front row, l to r) Dunka, Barbara Hansen, **M.R. Hansen** (CE69), and Enkhbaatar, Enkhchuluun



21. Peoria, IL Hardrocker happy hour: (l to r) **Dan Stanton** (CE01), Nathan Behning (ME), Anna Mollman, Zachary Boyd, and **Joe Corbett** (GeolE82)

22. Las Vegas, NV MinExpo hospitality buses group



AREA MEETINGS



23. Las Vegas, NV MinExpo group at welcome sign



24. Las Vegas, NV MinExpo hosts: **Ralph Wagner** (CE75) and Debbie Wagner



25. Houston, TX SWE and ASME social: (l to r) **Breanne Lundin** (ChE06), Colin McGowan, Carlos Beatty, Jr., Becky Miesen, **Cassandra Kingsbury** (MetE07), **Bob Miesen** (CE61), **Jason Ash** (ME99), Lisa Carlson, associate director of recruitment and graduate programs in the mechanical engineering department, and Ian Lundin



26. 2012 M Day muster in Bismarck, ND: (l to r) **Don Lapp** (ME92) and **Mary Kay Lapp** (IS96), **Jen Malloy** (CE07) and Cody, **Tim Hagerott** (ME02) and Kelly, and **Chelsea Wattier** (CE10) plus the kids (front row)

EXCELLENCE

the proof is in the numbers

500,000

The approximate number of specimens and artifacts held in collection by the James E. Martin Paleontology Research Laboratory

\$56,700

The average **starting salary** for School of Mines graduates

4.9

The percentage **increase of student enrollment** Fall 2012 compared to Fall 2011

128

The age of South Dakota School of Mines & Technology

120

The number of acres on which the School of Mines campus sits

4

The number of **LEED Gold certified** buildings on campus

The percentage of graduates who **immediately begin working** in their field of study or enroll in graduate school

97

14:1

The student/faculty ratio

SOUTH DAKOTA



SCHOOL OF MINES
& TECHNOLOGY

501 E. Saint Joseph St.
Rapid City, SD 57701

