

Petroleum Institute

The Historic Coolbaugh House

Orediggers Soccer Champs

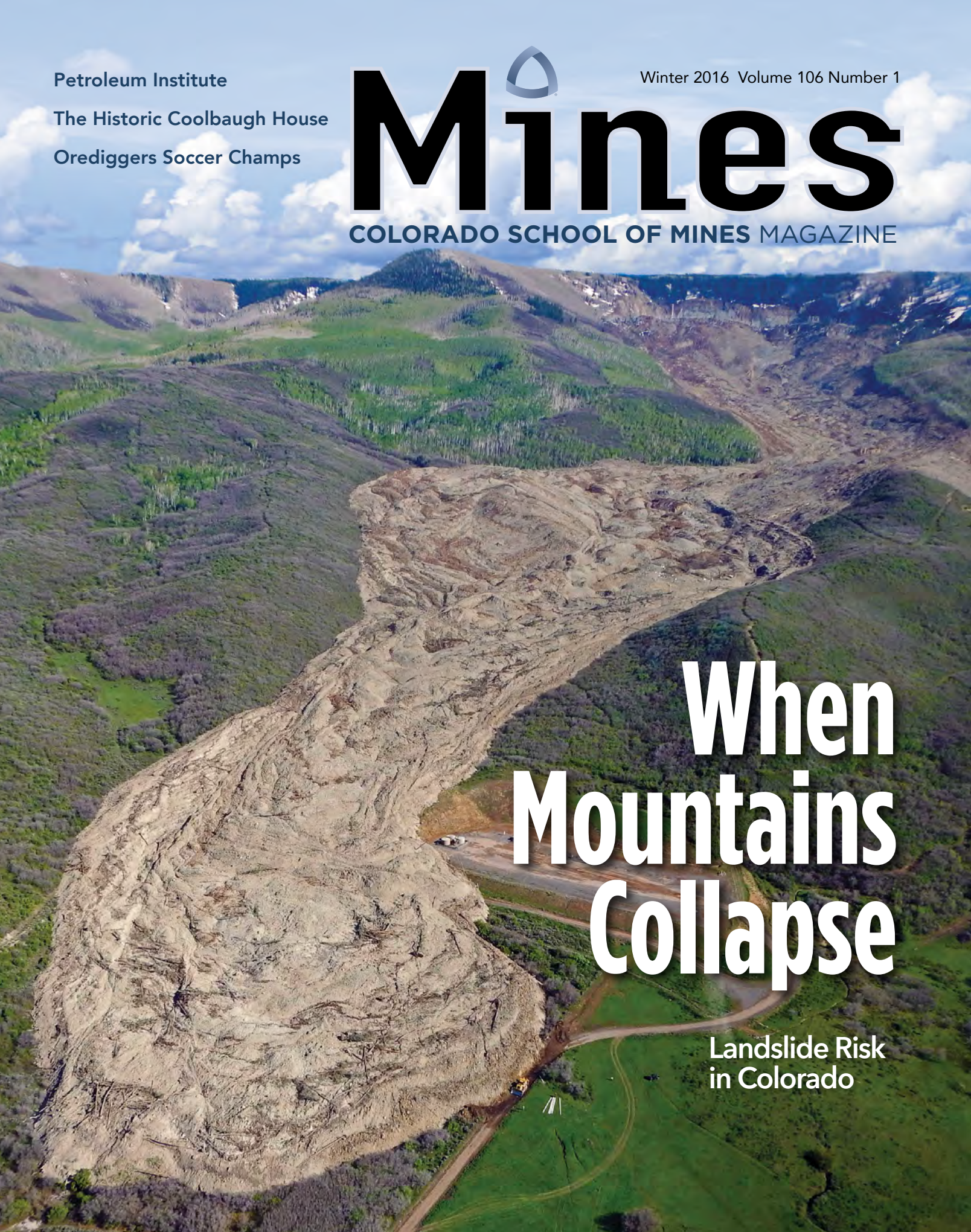
Winter 2016 Volume 106 Number 1

Mines

COLORADO SCHOOL OF MINES MAGAZINE

When Mountains Collapse

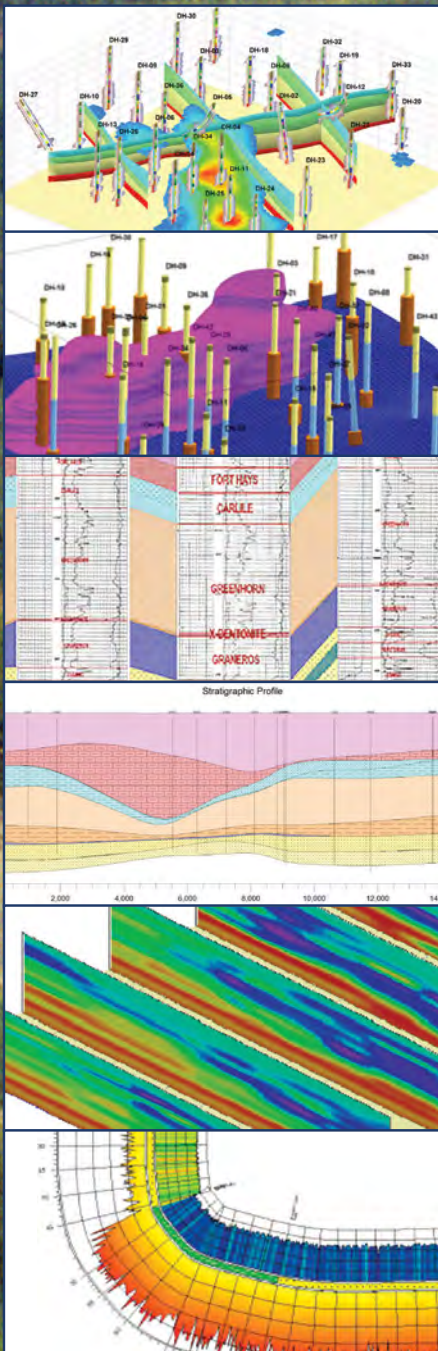
Landslide Risk
in Colorado





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In 2004, a massive landslide crashed down a stretch of the San Juan Mountains in southern Colorado. In an effort to understand landslide risk in Colorado, Mines researchers and the Colorado Geological Survey are trying to recreate a geologic event that no one witnessed.

20 From Golden to Abu Dhabi

Nearly 15 years ago, Mines was tapped to be the model for the new Petroleum Institute (PI) in Abu Dhabi. Today, the PI boasts more than 2,000 students, a reputation as one of the finest academic institutions in the Middle East, and a continuing cross-cultural collaboration with Mines.

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Cover image: On May 25, 2014, the West Salt Creek landslide devastated the small community of Collbran in Mesa County, Colorado. (Courtesy of Jon White/Colorado Geological Survey)

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Starzer Welcome Center Celebrates Grand Opening Read about the grand opening of the Starzer Welcome Center—new home to Admissions, Alumni Association, and Foundation.

Alumni Weekend 2015 Did you have a good time at Alumni Weekend? See more photos from the festivities at csmaa.smugmug.com/Reunion/2015AlumniWeekend. Read more about Alumni Weekend on page 26.

Q&A with 17-year-old graduate student Santiago Gonzalez At 17 years old, Santiago Gonzalez has already completed his bachelor's and master's degrees and is planning to pursue a PhD. Read more about his experience at Mines, what it's like to teach a 400-level course, and his future plans.

Meet Six Female Engineers from the Class of 2019 What does it look like to be a female engineer on campus? Get to know six first-year students and their take on being a woman interested in STEM.

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Photos



Text



Audio

CORRECTION: The letter titled "Engineering a Better Beer" in the Inbox section on page five of the Fall 2015 issue should be credited to Dale Fenwick '76 instead of Chuck Fenwick '76. We apologize for the error.



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President, Colorado School of Mines
Paul C. Johnson

President, Board of Directors
CSM Alumni Association
Ray Priestley '79

Editor, *Mines Magazine*
CSM Alumni Association
Laurie Schmidt

Editorial Assistant, *Mines Magazine*
CSM Alumni Association
Ashley Spurgeon

Editorial Board
Karen Gilbert, Peter Han, Lisa Kinzel,
Norma Mozeé '83, Laurie Schmidt (Chair),
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Contributing Writers
Larry Borowsky, Tim Flynn, Karen Gilbert, Emily
Gonzales '08, Lisa Marshall, Doug McPherson,
Daniel Strain, Rachele Trujillo, Angie Yearous '91

Copy Editors
Karen Gilbert, Kathleen Morton

Staff Support
Danelle Herra, Ruth Jones, Sandra Kohl, Linda
Nothnagel, Jo Marie Reeves, Angie Yearous '91

Advertising Contact
Ashley Spurgeon
aspurgeon@mines.edu
303-273-3959

Art Director
Craig Korn, VeggieGraphics

Printing
American Web
CPM Number # 40065056

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Comments and suggestions are welcome. Contact us via our contact form at <http://minesmagazine.com/contact-us/> or via mail at *Mines* magazine, PO Box 1410, Golden, CO 80402. To update your address, go to minesalumni.com/update or email jmreeves@mines.edu.

A Note from the CSMAA President



Deirdre Keating

In the movie *Dead Poets Society*, John Keating (played by Robin Williams) stands on his desk to impress upon his students the importance of constantly looking at things in different ways. That's what we have done at the Colorado School of Mines Alumni Association (CSMAA). We stood on that desk and looked at our world from a different point of view. And what we all saw was opportunity.

Fellow alumni, I am excited to share that we are reinventing our model for alumni engagement and outreach. We will join the ranks of the most prestigious institutions with the most connected and engaged alumni by making our network inclusive of all Mines alumni.

Recently, the CSMAA Board of Directors voted unanimously to adopt a dues-free membership model for our organization. Thanks to significant support from, and in collaboration with, our partners at the university and the foundation, membership dues will be a thing of the past. Beginning on July 1, 2016, all Mines graduates will automatically be welcomed into the alumni association with access to all member services and enhanced programs and initiatives.

Our new model expands our network of alumni members from 6,000 to 26,000, enriching connection possibilities for current students and alumni alike. This exciting change allows us to redirect membership recruitment efforts to focus on our mission of promoting Mines' rich tradition of excellence by fostering and strengthening connections between alumni and the Mines community.

I invite you to celebrate the new opportunities and attend upcoming events, including E-Days 'Round the World, Mines in Motion, golf tournaments, and more. For event locations and details, visit minesalumni.com/events.

Our Mines pride is strong and so are the long-standing traditions of our alma mater. Your passion and support for this university can make us even stronger. Please stay connected, get involved, and join us as we begin this exciting new chapter.

Visit minesalumni.com/membership to learn more about these changes or to share what programs and services you'd like to see from the alumni association in the future.

Sincerely,
Ray Priestley '79
President, Board of Directors
CSM Alumni Association

SCIENCE'S OWN CELEBRITY

Astrophysicist Neil deGrasse Tyson Wows a Packed House at Mines



Fans of Neil deGrasse Tyson lined up in the rain five hours before show time to catch an up-close glimpse of the celebrity astrophysicist credited with demoting Pluto, channeling Carl Sagan, and making science cool. "He's interactive and funny and explains things in a way that makes it easy for anyone to understand," said Mines alumna Kelsey Kopecky '13, who arrived at 2 p.m. for the 7 p.m. Alumni Weekend lecture at Lockridge Arena on September 30, 2015.

Tyson didn't disappoint. By the time he wrapped things up near 10 p.m., he'd led a captivated audience of 2,500 on an eye-opening, at-times hilarious, multimedia

journey from the birth of the universe to the origin of life and beyond, with detours through black holes, wormholes, and distant Technicolor planets. But first, he opened with a little ribbing: "This has got to be the geekiest audience I've ever had," he said, drawing applause from the 1,500 Mines students in attendance—many of whom camped out overnight to get tickets.

Raised in New York City and educated at Harvard, Tyson has been director of New York City's Hayden Planetarium since 1996 and a go-to space exploration consultant for U.S. presidents and NASA since 2001. He has written numerous astronomy books, including *The Pluto Files*:

The Rise and Fall of America's Favorite Planet, which chronicles his key role in the controversial 2001 decision to change Pluto's status from planet to dwarf planet. "I became the most hated man in the world among third graders," he told the audience, before sharing a letter written in "angry purple crayon."

He is perhaps best known as host of "Cosmos: A SpaceTime Odyssey," the FOX network's 2014 re-imagining of Carl Sagan's 1980 PBS series. The smash hit has appeared on 181 stations in 47 languages. "This is evidence that science is mainstreaming," Tyson said. His entertaining delivery may be one reason why.

Tyson began his Mines lecture—titled "Astronomy Bizarre"—with a playful discussion of how "Earth wants to kill you," noting that 97 percent of species that once existed here are extinct, thanks to tsunamis, earthquakes, climate change, and comet and asteroid impacts from a solar system he likens to a "shooting gallery." He then took the audience on a dazzling tour of that solar system, courtesy of images from NASA's New Horizons, Cassini, Voyager, and other spacecraft. Along the way, he cracked many Mines-directed jokes: "Is that really a stick of dynamite in the mouth of your mascot? That is one bad-ass burro." He also offered students inspiring words: "You see a problem that hasn't been solved and you run to the front of the line to try to solve it. We need a critical mass of problem solvers like you."

Tyson also raised provocative questions: Are there multiple universes? Is time travel possible? Could life have originated on another planet and been transported to Earth via microorganisms riding rocks dislodged by an asteroid collision? "That would mean all of us are descended from Martians," he noted, only half joking.

With the audience still spellbound after two hours, he dimmed the lights and projected a powerful image on screen—a recent photo of Earth (a tiny speck of white in the shadow of Saturn's rings) shot from Cassini as it orbited Saturn. Some call it the "Pale Blue Dot reprisal," referring to the famous shot taken from Voyager in 1991 at Sagan's suggestion. In a fitting conclusion, Tyson closed with a few of his predecessor's words about that dot:

"That's here. That's home. That's us. To me it underscores our responsibility to deal more kindly and compassionately with each other and preserve and cherish the pale blue dot—the only home we've ever known."

—Lisa Marshall

PRESIDENT'S CORNER

Staying Engaged



Thomas Cooper

As you read this, I will have just completed my first semester at Mines. It was focused on meeting you and hearing your stories and aspirations for Mines. As a quantitative measure of that time (as all of the engineers and scientists reading this will appreciate), I've hosted 24 faculty and staff lunches and 23 student pizza parties (sometimes three in one day!), attended seven alumni receptions, met with six

varsity sports teams, participated in three milestone events (M Climb, Alumni Weekend at Homecoming, and Parents and Family Weekend), opened two new buildings (Clear Creek Athletics Complex and the Starzer Welcome Center), participated in the Polar Plunge in Clear Creek and the Move Your Phi't 5K run, and shook the hand of one superstar astrophysicist (Neil deGrasse Tyson, President's Distinguished Lecturer). My wife Elyse has been involved in many of these events, including hosting breakfast for my CSM 101 class and 1965 graduates at our house on campus.

As full as my calendar has been, it has only covered a small slice of what happens on campus. In addition to classes and labs, every day there are guest lectures, varsity and club sports games, student group activities and meetings, student philanthropy events, and nearby Golden events such as the Ansel Adams exhibition at the Foothills Art Center—a collaboration between students in Mines' Geology Department and Division of Liberal Arts and International Studies.

It's clear that we landed at a university that values quality of life as highly as a hard work ethic and academic rigor. I believe that this sets Mines apart from other universities and results in graduates who continuously seek out new knowledge and experiences, embrace mental and physical fitness as a life-long priority, and are more engaged in their local communities and with their alma mater. From the stories you've told me, it appears that this has also been key to many of your successes.

Over the past few months, Elyse and I have enjoyed meeting our newest and most senior alumni and everyone in between and listening to your stories. I'd love to hear from you, so please share your thoughts with me at paul.johnson@mines.edu.

Go Orediggers!

—Paul C. Johnson

FACULTY SPOTLIGHT

Ryan Richards: Chemistry and Geochemistry Professor

As a teenage cowboy growing up outside Flint, Michigan, Chemistry and Geochemistry professor Ryan Richards may not have expected his future to involve researching the interface of catalysis and nanoscale materials. But, he says, it turns out that interface is one of the most exciting areas of modern science, and it sits at the forefront of the quest for a sustainable future.

“Catalysts facilitate chemical transformations from starting materials to products. For example, your catalytic converter transforms nitrogen oxides and carbon monoxide into lesser environmental hazards,” says Richards, who directs the Materials Science Program at Mines. “The products of catalytic processes account for about 35 percent of the gross world product and fertilizers generated through the Haber catalytic process sustain nearly 33 percent of the global population.”

Since most of the elements considered to be good catalysts are rare, a sustainable future will require materials from earth-abundant elements that possess new catalytic properties. “Nanotechnology is an exciting area of modern science that is demonstrating new properties of materials as a function of changing their size, shape, and composition at the nanoscale,” says Richards. “Harnessing synthetic chemistry to control and direct matter in this size regime gives researchers a lot of parameters to explore.”

In addition to his research pursuits, Richards enjoys working with his students and

brainstorming ways to unlock nature’s puzzles. To further round out his students’ education at Mines, he designed a new course aimed at developing tools to help them succeed as future scientists and engineers.

“This course basically teaches graduate students all of the skills they need to be successful but are never formally taught, such as pedagogy, writing papers and proposals, presenting research, and managing researchers,” he said.

Richards came to Mines in 2007 after serving as a founding faculty member at Jacobs University Bremen in Germany for five years. He and his wife, Sarah (an English teacher), served as college masters, living in a penthouse apartment in the dormitory and managing 280 students from 80 countries. “It was a great experience that was very influential for both of us,” Richards said, noting that their goal was to foster intercultural understandings among science and engineering students from around the globe.

But after his first daughter Sydney (now 10) was born, the Richards decided it was time to move back to the United States. With family already located in Colorado, the opportunity to teach and

conduct research at Mines was a perfect fit. The Richards family, which also includes six-year-old Maya, enjoys the Colorado lifestyle and spend the winters skiing at Copper Mountain.

Richards, a fellow of the American Chemical Society, received his bachelor’s degrees in chemistry and forensic science

from Michigan State University, his master’s degree from Central Michigan University, and his PhD from Kansas State University, which included six months as a visiting scientist at the Borekov Institute of Catalysis in Novosibirsk, Russia. He also conducted post-doctoral study at the Max-Planck-Institut für Kohlenforschung in Mülheim an der Ruhr, Germany. He recently spent a semester on sabbatical at the University of Queensland in Brisbane, Australia, where he conducted research and “spread the gospel of Mines.”

—Karen Gilbert

Courtesy of Ryan Richards





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BATTLEFIELD TO THE OILFIELD SCHOLARSHIP

How a small, veteran-owned company is helping fellow veterans receive a quality education

Resenergy, a small, veteran-owned, Denver-based supplier of ceramic proppant and frac sand to the oil industry established a \$25,000 endowed scholarship fund for veterans at Mines. "I know what veterans have gone through," said Bill Maher, Resenergy co-founder. "It's hard to finish college when you have returned from war and maybe even have a family to support."

"I know what veterans have gone through. It's hard to finish college when you have returned from war and maybe even have a family to support."

"Veterans are a perfect fit for the oil and gas industry," said Paul McKay, Resenergy co-founder. "Soldiers' dedication to hard work with long hours in less-than-desirable

conditions and their appreciation for teamwork, discipline, and leadership on the battlefield translate very well to careers in the oilfield."

When the selection committee couldn't decide between two well-deserving applicants for the first year's current use scholarship, Randy Yeager of Halliburton stepped up to fund the second scholarship out of his own pocket. What these veterans accomplished in the military and their professional lives so far humbled the committee and made them want to do even more to help them achieve their dreams.

To learn how you can create your own endowed scholarship fund for the Mines students you wish to help the most, contact Dean Laatt at 303-273-3079 or dlaatt@mines.edu.

2015 SCHOLARSHIP RECIPIENTS

Daniel Kaim

A senior petroleum engineering major, Daniel's experience on the frontlines of combat duty in Iraq contributed to his passion for the oil and gas industry. His hope is to help create an energy-independent America so our economy can be more resilient to outside events.



Cory Nunez

The GI Bill came up short to help Cory earn his degree in petroleum engineering in May 2016; Resenergy's scholarship helped make the difference. After serving as a combat leader in Sadr City, Iraq, Cory dedicated himself to getting his degree and becoming a problem solver in the oil and gas industry.



SPORTS

Mines Soccer: The Ties that Bind

In college athletics, bonds between teams are a given. No matter what sport student-athletes play, they all share a common thread of school pride and competitiveness. Those bonds are even stronger when it's the men's and women's programs of the same sport. And for Colorado School of Mines soccer, the relationship between men's and women's teams goes a step further.

On November 8, 2015, both teams celebrated together after winning Rocky Mountain Athletic Conference (RMAC) Tournament championships. Although the two teams had won the tournament in the same year before, it was the first time they had done it together at home.

Leading the two programs are two men whose relationship goes back nearly 30 years. In the late 1980s, men's head coach Frank Kohlenstein recruited women's head coach Kevin Fickes to play at University of North Carolina at Charlotte. Fickes starred for his 49ers, and the two kept in touch even after Kohlenstein came to Mines in 1998.

"One of the things he had said to us at our first team meeting my freshman year was, 'If you play four years for me, I'll do anything I can for you the rest of my life,'" recalled Fickes. "I was working at a hardwood flooring place part time, and I was miserable," Fickes said of his post-graduate years in North Carolina. "But I remembered Frank had said that, so I called him and asked him if there was any work to do out there."

The rest was history. Fickes joined Kohlenstein as his assistant coach with the men's program in 1998. When the women's team was established in 2005, the pair coached both teams before Fickes eventually took over the head women's job in 2010. "[Fickes] played for me as a college player, so he's like one of my kids," Kohlenstein said. "I started the women's program, so it's really special when they do well."

"Special" might be an understatement. Since 2010, the two have arguably been the most dominant soccer programs in their respective sides of the RMAC. The men have claimed two regular-season championships and four RMAC tournament titles in that span. And the women have a veritable dynasty going, with five consecutive tournament cups since 2011 and the last three regular-season crowns. The 2015 season was the first undefeated campaign ever for the men, and the women are coming off an appearance in the 2014 NCAA Final Four, the first by any team in Mines history.

The bonds are strong not only between coaches, but also among players—playing and practicing the same sport in the same stadium will do that. But for Joe Haines and Mel Westhoff, both senior captains of their respective teams, the ties run even deeper.

The two met when they were freshmen at a pre-season gathering of the men's and women's teams. More than four years later, after a home doubleheader

at Stermole Stadium, Haines proposed to his long-time girlfriend with some help from his teammates. As the men's team sang their traditional post-game fight song in front of the crowd, senior Jared Herselman plucked a surprised Westhoff out of the crowd. The men's team lined up on either side of Haines, and he popped the question in front of both teams.

For the record, Westhoff said yes.

"We're able to go home and talk about games, we have to schedule our dinners around practice, and we have huge support from our teammates," Westhoff said. "It's a huge part of our relationship."

—Tim Flynn



Joe Haines proposes to Mel Westhoff on October 23, 2015, at Stermole Soccer Stadium.

Tim Flynn

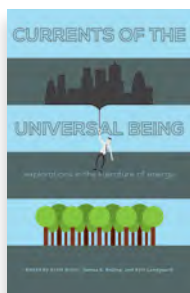
Leah Pinkus



The men's and women's soccer teams raise their RMAC tournament trophies.

For more on Mines athletics, visit csmorediggers.com.

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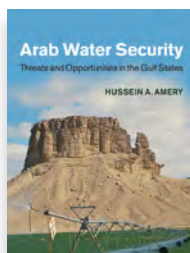
Currents of the Universal Being: Explorations in the Literature of Energy

James E. Bishop, teaching professor in Liberal Arts and International Studies (LAIS), co-edited *Currents of the Universal Being: Explorations in the Literature of Energy* with Scott Slovic and Kyhl Lyndgaard. The anthology of poetry, fiction, nonfiction, and personal interviews encompasses various energy-related topics and explores how energy is a fundamental aspect of our daily lives. The book is designed as a tool for students in writing or environmental studies classes and for general readers interested in the importance of energy. (Texas Tech University Press, 2015)



Energy in Literature: Essays on Energy and its Social and Environmental Implications in Twentieth and Twenty-First Century Literary Texts

Paula A. Farca, teaching associate professor in Liberal Arts and International Studies (LAIS), edited *Energy in Literature: Essays on Energy and Its Social and Environmental Implications in Twentieth and Twenty-First Century Literary Texts*. The book looks at recent world literature and how authors present energy sources ranging from coal and oil to solar, wind, nuclear, and hydropower. It also explores how these energy sources affect local and global communities. Other LAIS faculty also contributed to the book: Toni Lefton contributed three poems and Sarah Hitt wrote a chapter. (TrueHeart Press, 2015)



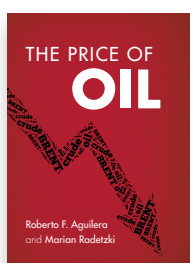
Arab Water Security: Threats and Opportunities in the Gulf States

Hussein Amery, associate professor in Liberal Arts and International Studies (LAIS), is the author of a new book titled *Arab Water Security: Threats and Opportunities in the Gulf States*. The book explores the national security implications of the Gulf States' reliance on water from desalination technology and related infrastructure. It also provides a systematic discussion of current and future threats to the supply of freshwater from desalination plants and suggests possible measures, both political and technological, that can be used to increase resilience to these threats. (Cambridge University Press, 2015)



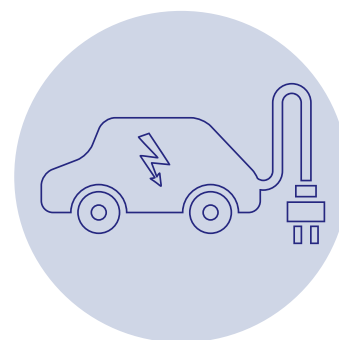
The Princeton Companion to Applied Mathematics

Paul Martin, professor in Applied Mathematics and Statistics, is an associate editor of the recently published *The Princeton Companion to Applied Mathematics*. The book introduces readers to applied mathematics and its uses; explains key concepts; describes important equations, laws, and functions; looks at research; and explores areas of application. The book also includes articles by Willy Hereman and Paul Constantine, faculty in Applied Mathematics and Statistics; and Roel Snieder, faculty in Geophysics. (Princeton University Press, 2015)



The Price of Oil

Roberto F. Aguilera MS '04, PhD '06 published a book co-authored by Marian Radetzki titled *The Price of Oil*, which provides an in-depth examination of the price of oil. The authors argue that although oil has experienced an extraordinary price increase over the past few decades, we have now reached a turning point where scarcity, uncertain supply, and high prices will be replaced by abundance, undisturbed availability, and suppressed price levels. (Cambridge University Press, 2015)



SUSTAINABLE TRANSPORTATION

Mines Unveils Electric Vehicle Charging Stations

In a move designed to help make it more convenient for members of the Mines community to choose environmentally friendly modes of transportation for their commute, the university has installed electric vehicle charging stations on campus.

Thanks to financial support from the Regional Air Quality Council and the Colorado Energy Office, Mines now has two single-port stations and two dual-port stations that can charge six vehicles at a time. The stations will allow faculty, staff, students, and visitors to charge their vehicles for free (a valid Mines permit or meter receipt is required) for a maximum of four hours per day.

As a result of this initiative, Mines received the 2015 EV Wired Workplace award signed by Gov. John Hickenlooper from Charge Ahead Colorado, an electric vehicle and infrastructure grant-funding program formed in partnership by the Regional Air Quality Council and the Colorado Energy Office. The new EV charging stations, located in the CT, E, and F parking lots, add to the many sustainable transportation options available at Mines, including a Zipcar rental program and RTD access.

—Karen Gilbert

STUDENT SPOTLIGHT

Grad Student's Work May Help Save Lives in Guatemala

Just after 3 a.m. on February 4, 1976, the quiet town of Los Amates, about 100 miles northeast of Guatemala City, suffered a cataclysmic earthquake. The 39 seconds of shaking leveled 258,000 houses and left 1.2 million people homeless, 77,000 injured, and more than 23,000 dead.

Ethan Faber, a Mines student who is working on his master's degree in geology and geological engineering, wasn't even born when the quake happened. But today, if he has anything say about it, that kind of devastating loss of life will never happen again in Guatemala. In fact, he's spending a year there applying his graduate research to a real-world problem.

In 2013, Faber approached his academic advisor Paul Santi, a professor in the Department of Geology and Geological Engineering, about the possibility of working on a landslide project in a poor community. "Ethan told me his career goal was to work on humanitarian projects in under-privileged areas," says Santi. "We talked about Guatemala's landslide problems, and, as it turns out, we had a good connection that would make working there a nice fit." Santi and Faber approached Edy Manolo Barillas MS '06, a Guatemalan native who returned to his country after graduating to become the national risk advisor. Barillas told them he would welcome the help.

Landslides are all too common in Guatemala, especially after rains. "During extreme years with tropical storms or hurricanes, a single event can kill 600 people," says Barillas. In 2005, landslides triggered by Tropical Storm Stan left hundreds dead in the country's highlands region of Panabaj.

Guatemala City is founded on relatively young, thick ash and pumice deposits that aren't well cemented or welded. "It has really steep cliffs and canyons that can easily crumble apart. And on top of that, the area has a lot of tectonic activity and high precipitation events with hurricanes, and then you get a lot of landslides on almost any hillside," says Faber.

Most landslide risk reduction in Guatemala has focused on relocation—forcing residents to leave areas considered to be uninhabitable. "Relocation is really the only true engineering solution to landslide risk, because retaining walls or other engineered mitigation techniques are almost always cost-prohibitive," says Faber. So, the mitigation ends up costing more than the houses it protects.

Moving houses is more effective—but rarely successful, as residents are hesitant to leave, despite the risk. "Many people have lived in the community all their lives, and their families live there," Faber says. "It's not my place to tell them they shouldn't live there, so the best I can do is to educate them on the basic



Ethan Faber



Brittany Faber

Ethan Faber's graduate work included collecting data in Guatemala by inventorying variables related to landslide risk, such as vegetation and slope stability.

This typical community in Guatemala is located on a hillside with an average slope of 40 degrees, which puts homes in the path of potential landslides.

principles of landslide risk and share ideas on how they can reduce that risk."

That's the foundation of Faber's work: education. After talking with and listening to residents, nonprofit

organizations, and government agencies during three visits, Faber built an evaluation tool with diagnostic questions on landslide risk so citizens can quantify their own vulnerability. "Some houses are at risk from falling materials, and some houses may fail because of loose ground," he says. "By better understanding this, they can do things like move their bed to the least dangerous side of their house, remove material from above their homes that could become dislodged, or install gutters to keep water away from unstable slopes."

In August 2015, Faber left for Guatemala with his wife to begin his work there (she left her job as a mechanical engineer to join him). And now it appears that his education efforts will continue even after he returns home, as Paul Santi has an incoming master's student who has committed to building on Faber's work. "It's been extremely rewarding looking back on what I've started," Faber says. "I'm enjoying looking ahead to see the endless opportunities awaiting."

—Doug McPherson

NOTE: Faber is looking to involve more people in this work. You can contact him at efaber@mines.edu.

A window to the future

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B.S., Chemical and Petroleum Refining
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Patent Attorney, Shareholder
B.S., Petroleum Engineering, 1981



Matthew Ellsworth

Patent Attorney, Shareholder
B.S., Engineering, with honors, 2003
M.S., Engineering Technology Management, 2005
Top Graduating Electrical Engineer



Doug Swartz

Patent Attorney, Shareholder
B.S., Mining Engineering, Minor
in Metallurgical Engineering, 1982



Cliff Brazil

Patent Attorney, Associate
B.S., Metallurgical & Materials
Engineering; Minor Bioengineering
& Life Sciences, 2011

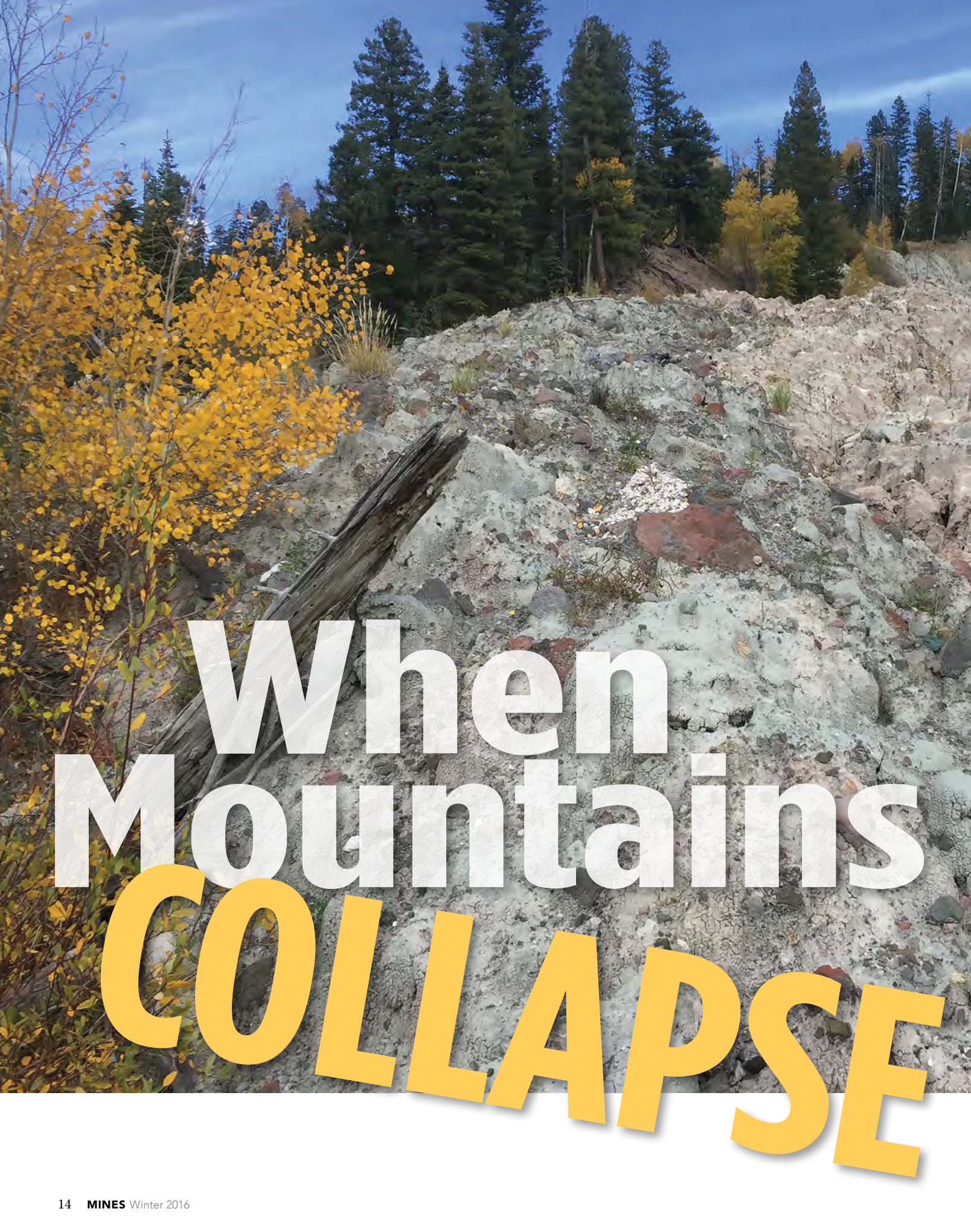


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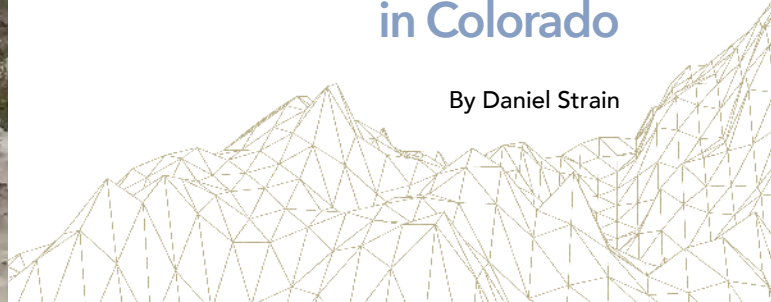
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When Mountains **COLLAPSE**

Mines Researchers and the Colorado Geological Survey Team Up to Analyze Landslide Risk in Colorado

By Daniel Strain



Paul Santi examines a complicated section of the Rio Chama landslide during an expedition to the site in June 2015.

The landslide that collapsed near the Rio Chama River in southern Colorado put the old riddle that begins with “if a tree falls in the forest...” to its extreme test. At some point, likely in spring 2004, a mass of rocks and earth crashed down a stretch of the San Juan Mountains, falling almost 1,200 feet to the meadow below. The debris scattered over a track roughly half a mile long, knocking down trees and leaving behind stumps, some of which today point in the direction of the slide.

The tumult would have been deafening. But, as with the proverbial tree that fell in the forest, no one was around to hear it.

The headwaters of the Rio Chama lie in a quiet corner of the Rio Grande National Forest, right on the border between Colorado and New Mexico. So, the landslide went largely unnoticed until recently, when a geology enthusiast from Colorado spotted the gray trail left behind by the falling rock in Google Earth images.

Today, the Rio Chama landslide is the focus of a research effort led by scientists at Mines. Like forensic detectives piecing together the scene of a crime, these researchers are trying to recreate a geologic event that no one witnessed. “We want to look at how it occurred. Is it likely to move in the future, and are there other areas nearby that may have the same problem?” says Paul Santi, head of the Department of Geology and Geological Engineering at Mines. The project is one of the most recent efforts to emerge from a collaboration between faculty at Mines and the

Colorado Geological Survey (CGS), a government agency that studies the state's natural resources and hazards. In 2013, the Colorado legislature transferred the CGS to Mines, making it an official part of the university.

The Rio Chama project is about more than just marveling at Rocky Mountain geology. The scientists hope that by exploring the conditions that triggered the isolated landslide, they can better predict when similar hazards might strike other areas of Colorado—where, unlike in the Rio Chama wilderness, people and infrastructure sit in harm's way.

The project highlights the benefits that come from the new partnership between Mines and the CGS, says Karen Berry, director of CGS and Colorado's State Geologist: it provides scientists who study landslides with a platform to help make Colorado a safer place to live. "It gives students a chance to be exposed to real world problems right in their backyard, and it helps us leverage the limited resources that we have to do more work and impact more lives across the state," says Berry.

LANDSLIDE COUNTRY

The Rio Chama landslide plunged down the mountain seven miles from the nearest campsite, at an elevation of 9,000 feet. In June 2015, Santi hiked to the site with a research team that included two Mines graduate students and Wendy Zhou, an associate professor in the Department of Geology and Geological Engineering. The way was tough going: on the trip in, the snowmelt was so heavy that every meadow the researchers crossed was covered in about a half an inch of water, Santi says.

They forded several ice-cold creeks, too. At one point, they had to pick up a fallen log and drop it over a rushing stream in order to get across. "I'm guessing we were the first people to be out there since elk season," Santi says. "As geologists, we love that. It's your own personal wilderness."

In many ways, that wilderness setting was a good thing. Because the landslide occurred so far from the nearest town, no one was hurt. Colorado's history, however, hasn't always been so kind. Landslides are common in the state, Santi explains, in part because of what draws many people here in the first place: the region's steep terrain and rugged slopes. "I tend to view mountain landscapes as something that are always on the verge of instability. They're eroding, and they don't want to be extra-stable," Santi says. When it comes to landslides, "it doesn't take much to kick these things off."

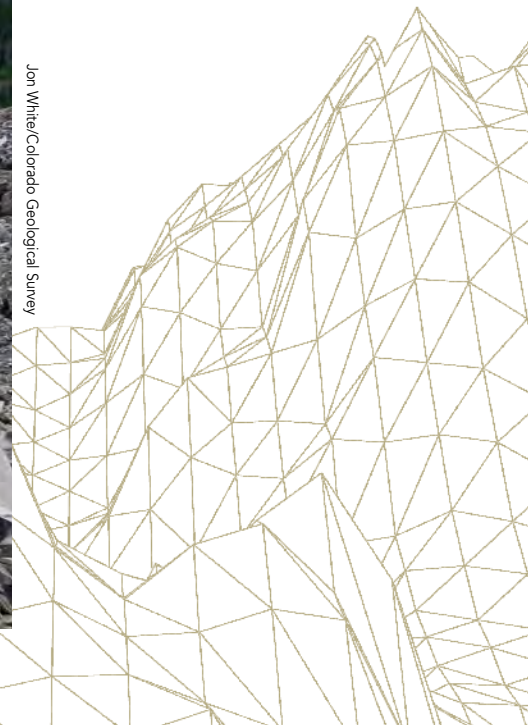
The term "landslide" encompasses a number of different kinds of events with names like rock avalanches, soil topples, and sturzstroms. The Rio Chama event, for instance, was a type of landslide known as a rockslide. But they all have something in common: debris, and a lot of it, that tumbles down a steep slope. Santi's work focuses on another type of landslide called debris flows—hazards made of a soupy mix of mud, logs, and other debris that builds up during rain storms and can careen downhill at speeds of up to 20 mph.

Local populations sometimes pay a steep price for landslide events: in 1903, a debris flow ran onto a railroad track near Glenwood Springs, Colorado. The resulting damage caused a train accident that killed one person. In 1924, a large landslide



This photo shows the view upvalley of the West Salt Creek landslide in Mesa County (note the geologist at right center for scale).

Jon White/Colorado Geological Survey





Landslides can have devastating impacts. This image shows a train that was derailed by a landslide in Wyoming.

PhilAugustavo, iStock

"One of our key missions is to reduce economic losses to the people of Colorado and to increase public awareness of natural hazards. Of course, landslides are a big part of that."

—Karen Berry

near De Beque Canyon in western Colorado diverted the flow of the Colorado River when it poured into a section of the waterway. More recently, in 2014, the West Salt Creek landslide roared down a mountain slope in Mesa County near the town of Collbran. The landslide was 2.8 miles long (in horizontal distance) and covered an area of nearly one square mile. Three men were caught in the debris, which moved at speeds of 50 mph or more—much faster than Santi's debris flows.

But even relatively minor landslides can damage property and infrastructure, including homes, roads, and gas drilling wells. In Colorado, roughly \$2.3 billion in infrastructure owned by the state sits in areas that may be vulnerable to landslides, according to estimates from the 2013 Colorado Natural Hazards Mitigation Plan¹.

The CGS has studied that same instability for decades, says Berry. One of the agency's inaugural tasks when it was formed in 1907 was to draw up a corner-to-corner topographic map of Colorado. Today, the CGS helps the state tap its natural resources, such as uranium formations and oil shale deposits. But it also seeks to reduce the dangers inherent to the Rocky Mountains. "One of our key missions is to reduce economic losses to the people of Colorado and to increase public awareness of natural hazards," Berry says. "Of course, landslides are a big part of that."

¹State of Colorado Natural Hazards Mitigation Plan, December 2013; prepared by the Division of Homeland Security and Emergency Management, Colorado Department of Public Safety.



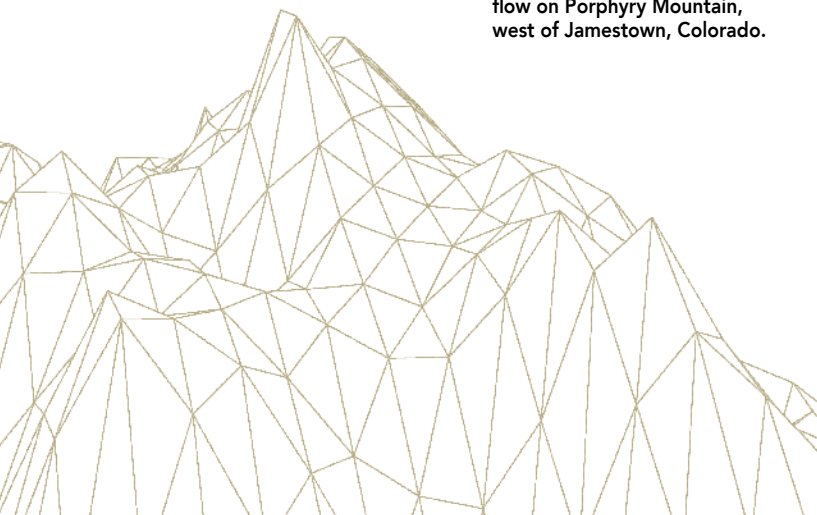
T.C. Wait/Colorado Geological Survey

Debris flows triggered by a landslide in 2007 caused damage to the mountain community of Alpine in Chaffee County, Colorado.



Matt Morgan/Colorado Geological Survey

A researcher surveys a debris flow on Porphyry Mountain, west of Jamestown, Colorado.



Since joining Mines, CGS staff have partnered with university faculty on a number of landslide research efforts. The agency also funds research projects by Mines scientists, including the Rio Chama study. And these collaborations have already born fruit. In September 2015, the CGS published an extensive report on the West Salt Creek landslide with help from Santi and other Mines scientists. The report concluded that the event was set in motion when a massive block slipped and rotated from the mountain slope. That failure caused a cascade of falling rock that stretched for 2.8 miles, making it the longest recorded landslide in Colorado's history.

Santi himself walked on the debris left behind by that event. He was joined by the brother of one of the men who had died in the collapse. "It's just eerie being out in something that looks like a meteorite hit it," Santi says. "There are trees that are fallen in every direction that you're stepping over."

But according to Berry, there are good reasons that scientists study disasters like these in detail—to make sure that no one else dies in accidents like this one. When it comes to landslides, "the key to predicting future behavior is looking at past behavior," she says.

THREE STRIKES

That past behavior was on display at Rio Chama. On their trip out to the wilderness, Santi, Zhou, and their students climbed almost to the top of the mountain's scarred surface—an experience that Zhou says left her with three bruised toenails. The team's goal was to map the geology of the collapse, documenting what sort of material fell during the event and where. If you spot a boulder covered in lichen, for example, then you're likely in a spot that hasn't experienced a landslide in several decades. Crushed rock, on the other hand, is likely a sign of recent upheaval.

The team's initial findings suggest that the rockslide moved a bit like a skier zipping down an alpine slope, Zhou says. At first, the debris fell quickly, rushing down a steep section of the mountain. Then it slowed down as it reached a flatter portion of the slope. Some of that debris, however, was pushed to the edge of that saddle where it tipped over, falling several hundred feet more to the valley below.

In the end, the researchers hope to discover what started this geological disturbance in the first place. To kick off a landslide, Zhou explains, a number of conditions need to come together. "There's a comparison to playing baseball—you have three strikes," she says. The first is the most obvious: steepness. In order for earth to come crashing down, you need to have a slope that tilts up at a sharp enough angle. Then there is the material that makes up a hillside itself. Loosely held-together rocks and silt, for instance, are much more likely to fall apart than solid stone. The final ingredient is water. Rain or snowmelt can seep into a mountain slope and weaken its surface, priming a hillside for failure. "As long as you have those three strikes, you're very prone to landslides," Zhou says.



Students Mariam Al-Jaberi and Bidisha Ghosh operate a drill press during a workshop on the women's campus at the Petroleum Institute.

FROM GOLDEN TO ABU DHABI

Mines-inspired Petroleum Institute
Flourishing after 15 Years

By Lisa Marshall



Debra Lasch

This image shows the façade of Arzanah, the headquarters of the women's college at the Petroleum Institute.

In the year 2000, the United Arab Emirates was on a roll. In the three decades since its founding, the coastal nation bordering the Persian Gulf had evolved from an impoverished desert populated by nomadic tribes to a glistening economic hub with one of the world's highest per-capita GDPs. Its largest state, Abu Dhabi, was home to one-tenth of the world's known oil reserves, and the economy was growing at a dizzying pace as the state-owned Abu Dhabi National Oil Company (ADNOC) moved to ramp up production. But the region lacked one critical asset: a top-notch science and engineering school.

"They were spending all this money on scholarship programs to send students to Western countries for an education," recalls Nigel Middleton, Mines' senior vice president for strategic enterprises. "They wanted to create a world-class technical university to enhance the fabric of their own country."

After an exhaustive review of proposals from 20 universities, ADNOC tapped Mines to be its model, partner, and guide for the ambitious venture. ADNOC would foot the bill, along with Shell, Total, BP, and the Japan Oil Development Company. Mines would provide the blueprint and help with administration. A year later, in 2001, the Petroleum Institute (PI) in Abu Dhabi welcomed its first all-male crop of students. Today, the PI boasts more than 2,000 students (including a growing contingent of women), a reputation as one of the finest academic institutions in the Middle East, and a continuing cross-cultural collaboration with Mines.

"We watched this go from a dream to now a fully operating university offering high quality education," says Middleton, who with emeritus professor Robert Baldwin, was instrumental in planning and developing the PI. "It has been quite exhilarating."

A CHALLENGING START

From their offices in Golden, Middleton and Baldwin hunkered down for 12 months in 2000 to swiftly develop a curriculum, administrative procedures, and architectural suggestions for building a top-flight scientific university from a vacant patch of dirt 8,000 miles away. Every six weeks, they'd board a plane for the 20-hour flight to Abu Dhabi to present their ideas to the ADNOC leaders (many of them revered Arab sheiks). They took care to comply with local decorum—wearing long pants, ties, and jackets, even on the hottest of days—and respect local religious customs.

Mines had a lot at stake. "It was an opportunity for us to have a footprint in the UAE, one of the major oil-producing countries in the world. It was a high-profile partnership that gave Mines a more global presence," recalls Middleton.

On September 10, 2001, Middleton stood proudly at the entrance to the modest 12-classroom building that comprised Phase One of the new PI campus and welcomed its inaugural class of 139 men. The next day, as he packed to go home, he flipped on the television and watched the second plane crash into the World Trade Center towers.

"We were totally shattered," recalls Middleton, who didn't get home to Colorado for two weeks, due to flight cancellations. Once he did, he was very worried. "The UAE is a very peaceful country,



Deirdre Keating

Petroleum Institute students pose with Mines faculty and staff outside Engineering Hall.



Courtesy of Nigel Middleton

Dr. Robert Baldwin, Emeritus Professor and former Head of Chemical Engineering at Mines, consults with ADNOC civil projects engineers on the construction of the founding building of the Petroleum Institute (circa 2001).

but we had no idea what the spillover might be in the Middle East," and what it might mean for the newly opened institute. Fortunately, within about a month, life in Abu Dhabi was largely back to normal, and the Institute's first year was in full swing.

Inside the PI's walls, Mines faculty—who had moved there to help get the institution off the ground—faced their own challenges as they dealt with different learning styles and expectations from students.

In an Arab culture deeply rooted in oral tradition and respect for elders, education often relied heavily on rote memorization and recitation. As a result, many incoming students lacked strong reading and critical thinking skills and had trouble thinking outside the box, recalls Mines emeritus professor John Golden, who served as the PI's first academic vice president. Many had

Petroleum Institute students present design prototypes to their client, Encana Corporation, during the summer course held on the Mines campus in July 2015.



never conducted a hands-on experiment in a laboratory before. To bridge the gaps, the PI developed a Foundation Year program, in which incoming students learned to master English and computer skills and recognize the importance of curiosity-driven science and independent learning.

The most notable cultural difference, however, was the absence of women. “About a year after I got there, I started advocating for them to bring women to campus, but they were just not ready,” says Golden. But it wasn’t long before that changed.

In 2006, the last year Golden and his wife Lynn (a counselor at the school) were there, the PI enrolled 104 women to study at a separate female-only campus. When those women graduated a few years later, the Goldenes returned so John could deliver the commencement speech. “It was just wonderful to go back and see that happen,” says Lynn. “I really marvel at the amount of progress that has been made there in such a short time.”

ONGOING EXCHANGE

Today, the relationship between the two institutions remains solid. About a dozen graduating PhD students from Mines have moved to Abu Dhabi to teach at the PI, alongside an international faculty of 200 (the PI is now accredited by the U.S.-based Accreditation Board for Engineering and Technology). Numerous PI graduates have come to Mines to earn their advanced degrees. And thanks to a growing PI emphasis on research, co-investigators from each campus now collaborate on research projects, exploring topics such as developing a better fuel cell for cleaner energy production, building robots to monitor scorching hot refineries, and enhancing oil and gas recovery from the geologically unique reservoirs of the Middle East.

While the men’s and women’s undergraduate campuses remain segregated (a situation Middleton and others hope to ultimately see changed), women now account for more than half the student population at the PI. “The women’s program there has been just phenomenal,” says Middleton.

During summer 2015, 18 female undergraduate students flew to Golden for a two-week visit packed with cultural and educational

programming. They stayed in the dorms on campus, attended a lecture at a local Islamic center, went ziplining in Vail, and hiked to the top of South Table Mountain. “The sense of achievement and joy of making it to the top was overwhelming,” says Maryam Mardood, a second-year PI student majoring in petroleum geosciences.

The women also participated in an intensive workshop led by instructors from Mines’ EPICs Design and Humanitarian Engineering Program. Their assignment: to seek out stakeholders affected by a mock proposed drilling operation atop South Table Mountain and address their concerns in the design plan. “This whole concept of consulting stakeholders and working their needs into your design is becoming not just fashionable, but necessary, in the industry today,” says humanitarian engineering instructor Ben Teschner, who has since developed a whole course modeled after that two-week workshop.

The women fanned out across Golden, interviewing a pre-screened bike shop owner, a realtor, a neighbor, an open space worker, and a professor. Then, they presented their plans to the mock client, Ray Priestley, a real-life business development advisor for Encana Corporation.

Some workshop attendees developed elaborate plans to use helicopters to mitigate traffic concerns. Others mapped out underground tunnels to reduce the project’s impact on the skyline. Many say they walked away with new skills and a heightened sense of confidence. “The design workshop taught me that by believing in my capabilities, believing in my ideas, and working hard, I can create innovative solutions to the different challenges I might face,” says Mardood.

Priestley says he gained a lot from the experience, too. Prior to meeting the women, he admits that he had a preconceived notion that they would be quiet and reserved. They were nothing like that. “It was a real eye-opener for me,” he says, referring to the encounter as an example of how people from other parts of the world are “more like us than different from us.”

“I only hope we made as good an impression on them as they made on us.” 



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LOOKING BACK

There's No Place Like the "House"

Golden History Museums, City of Golden Collection Reprint #2012.009.002



Melville and Osie Coolbaugh sit in front of the living room fireplace in Coolbaugh House on Christmas Day, 1949.

Laurie Schmidt



The living room in Coolbaugh House today looks much like it did back in 1949.

The Colorado School of Mines Alumni Association (CSMAA) completed its move to the brand new Starzer Welcome Center in mid-October (2015), ending its five-year residency in the historic Coolbaugh House. The rambling old bungalow at 1700 Maple Street—with its byzantine layout and low, slanting ceilings—had its drawbacks as an office space. But what it lacked in professional polish, the Coolbaugh House more than made up for in charm.

"It was like coming home to go to work," says Ruth Jones, CSMAA's senior associate director of programs. "Some of us had fireplaces in our offices, and we could walk around in slippers."

"It would have been a fun place to play hide-and-seek as a kid," adds Danelle Herra, communications manager at CSMAA. "When we started getting organized to move out, I discovered places I didn't even know existed."

It sometimes took a generous share of creativity to make the structure's residential layout work as an office space. "We had people crammed in everywhere, from the attic to the basement," says Jones. The house's irregular corners forced staffers to wedge filing cabinets and supply shelves into unlikely places, making maximum use of every nook and cranny. But despite its quirks, the Coolbaugh House was an apt headquarters for the Alumni Association.

"It was a good fit for the size of our staff, and it was a sentimental spot for so many alumni. They remember it from their student days," says Jones.

The house typifies the Arts and Crafts architectural style that gained popularity in the United States during the early 20th century. Defined by elegant lines, precise construction, and fine materials, Arts and Crafts bungalows replaced Victorians as the middle-class housing of choice.

Built in 1922 by former Mines president Melville F. Coolbaugh (1925-46), the house has a long tradition as Mines' unofficial "welcome center." Its broad, congenial porch has been a popular gathering spot for many decades. Over the years, the picturesque bungalow hosted faculty gatherings, class reunions, awards ceremonies, and other social functions. It even served as student housing for a time.

"An alumnus came by recently who had lived in the house," says Angie Yearous '91, CSMAA's membership specialist. "He and about six other guys had rented it once. He came in and looked around, and when he saw the kitchen his face lit up and he said, 'We baked so many cakes in this kitchen.'"

Melville Coolbaugh initially came to Mines in 1917 as head of the chemistry department, but his stay ended prematurely when the U.S. Army called him away the following year to help design munitions for the nation's World War I forces. He returned to Colorado's Front Range in 1919 and served in a series of corporate executive jobs, while building the house in 1920-21 to accommodate his growing family, which eventually numbered four children.

Coolbaugh took over the Mines presidency in 1925, during a difficult period in the university's history that coincided with a postwar slump in the mining industry. Over the next two decades, he pulled the university out of a financial downturn, increased enrollment, and restored Mines to a position of national prominence. After

shepherding the school through the Great Depression and World War II, Coolbaugh stepped down as Mines president in 1946 to serve on an advisory committee to President Harry S. Truman.

After his retirement, Coolbaugh maintained an office on campus and remained a prominent, well-liked figure. With his own children grown, he and his wife, Osie—known affectionately to students as “Mama Coolbaugh”—began renting their spare bedrooms to Mines students.

President Coolbaugh “was a man of infinite humor and wisdom,” writes Ian Mackay ’53, who moved into the Coolbaugh House in the late 1940s while pursuing his graduate degree. “He expected the best from those he loved the most, and this included the students of the Colorado School of Mines. Only someone who had the luxury of living under their roof could truly appreciate their warmth and humor.”

After Melville Coolbaugh’s death in 1950, Osie Coolbaugh remodeled the home and added two more bedrooms to accommodate more lodgers. She eventually moved to a smaller house nearby, but students continued living in her former residence for many years.

When Osie died in 1969, her children retained ownership of the home but offered the use of it to the newly organized University Club. More than 100 individuals (most of them faculty) and 20 Mines departments purchased memberships in the new organization. Some of the funds were used to restore the

Coolbaugh House to its original Arts and Crafts splendor, with period furnishings and decor. In 1985, Coolbaugh House was designated a City of Golden Historic Landmark.

Although Mines students no longer lived under the Coolbaugh House roof, they still sought out the home’s embrace. Student clubs and organizations routinely booked the space for meetings and events, while the porch remained a popular after-hours hangout—a respite from roommates and homework.

By the time the Alumni Association relocated to Coolbaugh House in 2010, multiple generations of Mines students had formed personal attachments with the old house. That made it a perfect setting for CSMAA’s annual events, such as Homecoming Weekend.

Visiting alumni would assemble on the beloved porch and spread out across the house’s airy southern lawn for alumni weekend barbecues. “People just really enjoyed stopping by,” says Jones. “They’d drop in, pick up their packets for the weekend, and just linger and look around.”

The new Starzer Welcome Center offers charms of its own, and CSMAA staff look forward to showing off their new digs to alumni. “We’re thrilled to be here,” says CSMAA interim director Emily Gonzales ’08. “It’s really going to serve our alumni well, and it’s a great fit for us.”

Still, as they walk down Maple Street on their way to various campus meetings, CSMAA staff say they always look fondly at the Coolbaugh House.

—Larry Borowsky



The CSMAA staff gathers on the porch of Coolbaugh House just before moving to the Starzer Welcome Center. From left to right: Laurie Schmidt, Sandra Kohl, Emily Gonzales '08, Ashley Spurgeon, Ruth Jones, Jo Marie Reeves, Angie Yearous '91, Danelle Herra.

ALUMNI NETWORK

ALUMNI REUNION

Orediggers Return for Homecoming Weekend

Alumni Weekend is an annual Mines tradition that brings alumni to campus for reunion dinners, campus events, and interaction with students and faculty; it's a chance to relive old memories and create new ones with classmates. In 2015 and going forward, this special weekend takes place during Homecoming in the fall.

This year's event brought more than 600 alumni and guests home to campus, making the weekend a true homecoming for all. The weekend showcased a complete picture of Mines today: our remarkable academic progress was featured through department tours and a talk series; our incredible student athlete success was highlighted during the homecoming football game, varsity soccer games, and tour of the new Clear Creek Athletics Complex; and the balance between students' social and extracurricular lives was evident at the Mines Market open house lunch and Homecoming parade and tailgate.

Each Alumni Weekend, alumni celebrating their 50th reunion are the "honored guests," as Larry Hoppe '65 described it. For some of them, this is their first campus visit in 50 years. And thanks to efforts by the reunion committee, Mines is able to roll out the red carpet for these alumni. This year, they were treated to a special breakfast at President and Mrs. Johnson's residence, invited to be judges for the student floats in the homecoming parade, and welcomed into the Blaster Room during the football game. To top it off, the football alumni from 1965 paraded onto Campbell Field at Marv Kay Stadium for the coin toss. Their grand entrance included a mock lineup, with the alumni assuming their original field positions. "The President's Breakfast, the great football game, and the dinner were my favorite parts of the weekend," said Bill Wilson '65.



Alumni from the classes of 1990 and 2005 take a break from the yard games and BBQ to pose for a reunion photo.



Marilyn "Maribeth" Moll '05 and her daughter, future Oredigger Thalia Sofia Moll Baird, had plenty of fun during Homecoming Week.

The Class of '65 wasn't the only featured class. Graduates from the classes of 2005, 1990, 1975, and years prior to 1965 all enjoyed reunion dinners on Saturday, October 3, at venues ranging from a food truck in Lions Park to more formal dinners at Table Mountain Inn and the Old Capitol Grill. For many, the reunion dinners were the highlight of Alumni Weekend festivities, all of which took place September 30 through October 3. When alumni were asked to share the best part of the weekend, "seeing old friends" was the most common response.

Another attendance motivator was the Homecoming football game, during which the Orediggers defeated New Mexico Highlands 51 to 6. Alumni and



Bill Wilson '65, John Weber '66, MS '68, Lothar Klingmuller '65, and Frank Erisman '65 deliberate over the scores for the students' Homecoming parade floats.

students in the stands had numerous opportunities to belt out the Mines fight song, which is traditionally sung after every Mines touchdown.

Of course, many alumni came back home to see and learn how Mines has changed. "Mines has certainly grown a great deal," said Justin Rotello '10. The MINES Talks, modeled after the popular TED Talks, helped inform alumni about Mines' growth. The talks included topics such as Contemporary Expectations of Future Engineering Graduates, Teaching Physics in the 21st Century, and The Resilience of our Cities.

We look forward to seeing even more alumni at next year's Homecoming Weekend in Fall 2016.

—Emily Gonzales '08

ALUMNI AWARDS

CSMAA Honors Outstanding Alumni

The Colorado School of Mines Alumni Association (CSMAA) proudly honors exemplary members of the Mines community with several awards each year. Alumni nominate their peers for each award, and the winners are chosen by an awards committee made up of alumni members and staff. We would like to congratulate the 2015 winners and thank those who submitted a nomination.



Ronald Kem

ALUMNA OF THE FUTURE:

Presented to a student for their efforts in strengthening and embodying the spirit of the CSMAA, the 2015 award was given to **Alyse C. White '15**, a recent petroleum engineering graduate. As the founding president of the Student Alumni Association, White started the #OrediggersEverywhere campaign and the Alumni Association's Instagram account.



Ronald Kem

MELVILLE F. COOLBAUGH AWARD:

Paul M. Anderson '85 was selected for making outstanding contributions toward improving the image and enhancing the reputation of the school. For the past four years, Anderson has been the main speaker at the National Engineering Week held at Mines. He was also instrumental in bringing the American Institute of Aeronautics and Astronautics (AIAA) Annual Technical Symposium to Mines this fall.



Ronald Kem

OUTSTANDING ALUMNUS AWARD:

C. Barclay Macaul '84 was recognized as an alumnus who has contributed meritorious service on behalf of the CSMAA. Macaul rejuvenated the Atlanta alumni section, and after moving to Calgary, he became their section coordinator. Recently, he has helped start and run a new alumni group in The Woodlands, Texas.



Ronald Kem

YOUNG ALUMNUS AWARD:

Presented to a young alumnus whose accomplishments have reflected favorably on the school and the CSMAA, this award was given to **Justin D. Anderson '05, MS '06**. Anderson is an officer for the Society of Mining, Exploration and Metallurgy (SME) Colorado Section, and he is active in the development and mentoring of young professionals at Mines.

CSMAA also presented **President Paul C. Johnson** with an Honorary Membership to the Alumni Association.

—Angie Yearous '91



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REMEMBERING JOHN P. LOCKRIDGE, 1931–2015

Mines Celebrates the Life of Mr. Niobrara of the High Plains

John Lockridge's contributions to the Colorado School of Mines and the petroleum geology industry are unparalleled and rare, much like the geological discovery that gave him a reputation as a groundbreaking explorer and earned him the nickname "Mr. Niobrara of the High Plains."

John grew up in the small town of Marshall, Missouri, with a family who placed great value on higher education. It was expected that John would attend college, like his four older siblings. But when John came of age, the college savings had been spent, so his father gave him \$25 for bus fare to the school of his choice. Always resourceful, John used his special aptitude for math and science to earn a full academic scholarship to Colorado School of Mines, where he was a varsity basketball player and swimmer.

John graduated with a professional degree in geological engineering in 1952 and entered the petroleum field, quickly rising in the ranks. After 17 years with Mobil Oil, he and a partner started a new company, Mountain Petroleum, which led to his historic gas discovery and extraction of more than a trillion cubic feet of gas in the Niobrara chinks of eastern Colorado. This rich find in the Niobrara may have lain dormant indefinitely were it not for John's geological initiative and exploration skills.

Fond memories of playing basketball for the Orediggers drove much of John's philanthropy at Mines. In 2001, he and his wife, Erika, created the Blaster Basketball Scholarship Fund, and four years later they helped fund the Student Recreation Center, with Lockridge Arena as the epicenter. John was named to Mines' Athletics Hall of Fame in 2003, and his #16 jersey was retired in 2007.

In 2012, John and Erika expanded on their longtime support for the Geology Department with a transformative gift in support of the Robert J. Weimer Distinguished Endowed Chair in Sedimentary and Petroleum Geology. John also generously donated his time to Mines, serving as a board member with the Alumni Association and the Foundation Board of Governors, and meriting a Distinguished Achievement Medal from the Mines Board of Trustees.

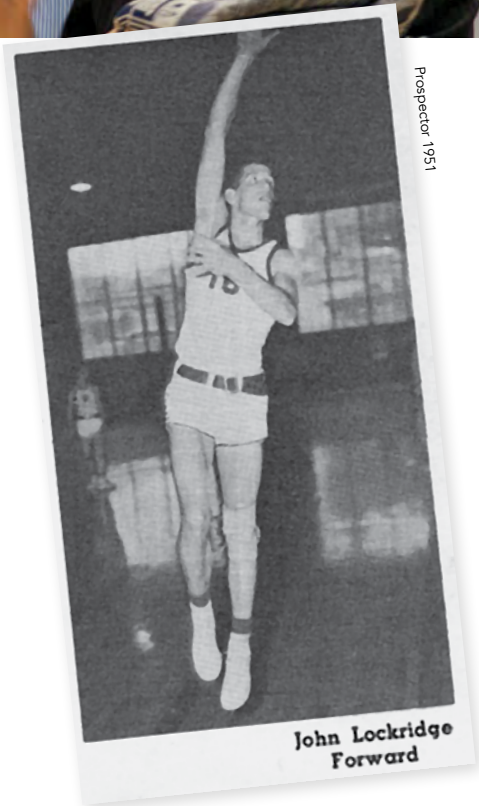
Few leaders have John's unique combination of exploration technology knowledge, exemplary business judgement, judicious financial oversight, and gut instinct for strong investments. This extraordinary capacity, along with the a warm smile and kind words for all, earned John a lifetime honorary membership with the American Association of Petroleum Geologists, as well as a Tourmaline Award from Colorado School of Mines.

John is survived by his wife Erika; sister Florence; children Nancy (husband Bruce), Laura, Monica, Nick (partner George), Eric (wife Kim), and grandchildren Erika, Anika, Nicholas, Liam, and Isabella. Erika hosted a memorable celebration of the visionary's life at Lockridge Arena in October, with special remembrances from university leaders and Mines basketball coaches and players.



John and Erika Lockridge are honored at a basketball game at the Lockridge Arena when John's jersey was retired in 2007.

Chris Peters



Prospector 1951

John Lockridge Forward

John Lockridge shows his hook shot as an Oredigger forward in 1952.

—Rachelle Trujillo



ON OUR WALL

How are you using your Mines degree in a non-traditional way?



With my Mines degree, I am helping healthcare workers in Colorado Hospitals improve quality, reduce patient harm, and save lives. I manage statewide quality and patient safety initiatives for the 95 member hospitals of the Colorado Hospital Association (CHA). The aim of one of the projects I currently manage (CHA's Antimicrobial Stewardship Collaborative) is to increase the amount of correct diagnoses of certain infections and improve proper prescribing of antibiotics in the hospital setting.

—Sarah Hodgson '09

The one general area where you see many Mines graduates is in sales. I, for one, spent about three years in mining engineering-related work after graduation, but I switched to a manufacturing company during the lean times of the early 80s. It has been a great career path as I have stayed connected to mining, along with construction and energy development. My engineering degree has played a strong role in my career development and relationship with all of the customers I have met through the years.

—Ron Boyd '79

My work at Amoco actually got my new career jumpstarted. I have been CEO of a web development, hosting, and marketing company for the past 20 years. We have focused on corporate and government accounts but also enjoy doing small business. Many of our clients have been in the oil and gas business, and naturally, they are always the most fun to work with!

—Susan Donohue '85

I am currently using my economics degree as a financial and business planning specialist. I work in an entrepreneurial capacity helping people grow solid financial structures for their personal and business affairs.

—Justin Neal '13

I have worked for mining companies and construction companies but have spent most of my career in technical sales. I would have never thought I would spend time underground in copper mines in Chile and Peru, on a tunnel project in the Philippines, or on subway construction projects in Seattle, San Francisco, and New York City. My Mines degree has made all of this possible, not to mention the Miners I have had the privilege of working with in all of these locations. The degree is a start; it is what you do with it that makes life exciting.

—Bill Warfield '75

I've used my ETM degree throughout my Coast Guard career, from program management, staffing, and resource planning; to helicopter operations and maintenance; to managing Captain of the Port duties of the fifth largest port in the U.S. My Mines degree has been a huge asset for me!

—Tony Hahn MS '04

Alicia Jessop '06 is an assistant professor of law now, and she graduated with a degree in economics. She started out with a blog on sports law and now writes for MSNBC. As for me, I'm doing a startup nonprofit called Creating Potential, which exposes students to the STEM fields through career exploration and externships/internships. I'm still an engineer by day.

—Islin Munisteri '09

My BS in chemical engineering '99 and MS in chemistry '02 served as a foundation for entering medical school, eventually becoming a cardiothoracic surgeon and an Air Force officer. I thoroughly enjoyed my Mines experience. I am a testament to the fact that Mines can prepare its students for any career that one may desire. Go Orediggers!

—David Graham '99, MS '02

I am currently VP of Sales, Marketing, and Customer Support for Zodiac Water & Waste Aero Systems, providing water and waste systems to commercial, regional, and business aviation aircraft (truly a plumber, and yes, we do make toilets). I have spent over 30 years in aviation and loved every minute.

—David Conrad '79

I graduated with a degree in mining, but in the last 15 years I found myself managing an archaeology survey across 600+ miles of West Africa, a marine mammal research field program in Far East Russia, and national content in Iraq. Never in my wildest dreams as I walked across the podium to receive my degree...

—Joey V. Tucker '77

My husband Jesse Geiger '08 and I are currently engineering directors for a pay-as-you-go solar business-as-mission in Uganda. I also worked on water projects in Tanzania, Zambia, and Guatemala. Additionally, my participation in the McBride Honors Program opened many non-traditional doors for me, including working for the U.S. House of Representatives Natural Resources Committee, Senator Wayne Allard, Denver Mayor's Office, and legislative services with Aurora Water.

—Rachel Geiger '08

Since graduating from Mines, my professional time has been spent in the world of sales, marketing, and currently, the launch of my first book—which has tons of moving parts, just like a mechanical system all having to work in harmony together. Being an engineer means having an ability to solve challenging problems, and even though I have never actually worked as an engineer, I absolutely use my engineering degree every day.

—Matthew R. Harris '09

I have a degree in economics from Mines. I am a senior loan officer with Castle & Cooke Mortgage, and I use the problem solving skills, economic analysis, and data analysis skills that I learned at Mines every day. My degree sets me apart from all of my competitors from a resume standpoint, as well as a practical standpoint of having a better understanding of financial markets, allowing me to help my clients make the best possible financial decision.

—Joe Massey '01

What has been exciting about being a mining engineer in foreign countries is what I get to do on weekends and vacations. I have used my engineering skills to design and build schools, clinics, church buildings, and even a bridge in some of the most remote areas of the world, including Haiti, Senegal, New Guinea, Kenya, Peru, Mozambique, India, Zambia, and Indonesia. It has been a glorious career.

—Michael Mosley '69

I am currently working as a R&D nursery project lead, managing soy and corn project teams on Kaua'i.

—Carl Hamrick '92

My degree provided me with an ability to launch my career in semiconductors as a microprocessor failure analyst at Motorola. With a subsequent MBA from UT Austin, I transitioned to the Intellectual Property Licensing field, where I'm now responsible for the proliferation of engineering innovations while ensuring protection of IP value.

—Ilya Kats '96



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ALUMNA PROFILE

Retirement Doesn't Mean Slowing Down

After dedicating nearly 45 years to Mines and being the longest serving female faculty in Mines history, it's safe to say that Catherine Skokan '70, MS '72, PhD '75 was—and still is—an important leader in the Mines community. Although she retired at the end of the 2014-2015 academic year, she is still very involved with Mines and its students. "Retirement means that I don't have a paycheck from Colorado School of Mines, and I don't have an office. It doesn't mean anything else," says Skokan. And her connection to Mines is something she is not ready to give up.

Skokan first came to Mines as a student at age 17, receiving her degree in geophysical engineering in 1970. She was one of only a dozen or so female students, but that didn't bother her. She was very involved in the Mines music program, playing the bassoon in the marching band and singing in the choir. Despite the challenges associated with being one of the few female students on campus—such as when a professor assumed that a chemistry experiment explosion was hers when it really belonged to the male student sitting next to her—she pushed through and did what she wanted to do. "I did just fine by myself, thank you very much," she says.

Skokan went on to make history when she became the first woman to receive a graduate degree from Mines, receiving her master's degree in December of 1971 and her PhD in December of 1974. Although her achievements are important marks in the Mines history books, Skokan didn't even realize that she was Mines' first female PhD recipient until about 10 years after she graduated. "That shows you how much anybody paid attention," she says. "We were just too busy doing it."

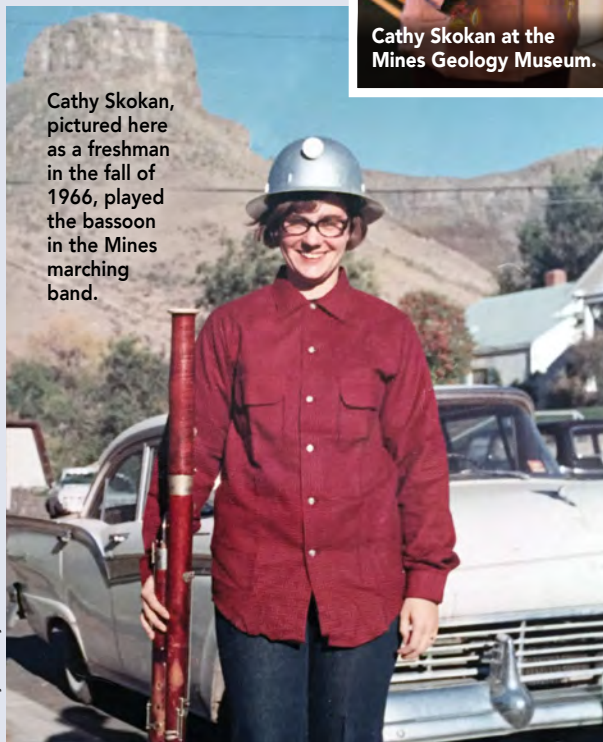
While it was never Skokan's intention to teach—she originally thought she wanted to work for the U.S. Geological Survey—she soon found herself back at Mines teaching linear systems at the insistence of Dr. George Keller, then the head of the Geophysics Department. She discovered that she enjoyed teaching, even though she disliked linear systems as a student, and continued in the Geophysics Department for nearly 20 years.

In 1996, Skokan moved to the Electrical Engineering and Computer Science Department as a tenured associate professor. Over the years, she was recognized many times for her teaching, receiving distinctions such as Outstanding Professor in Geophysics,



Rick Souders

Cathy Skokan at the Mines Geology Museum.



Cathy Skokan, pictured here as a freshman in the fall of 1966, played the bassoon in the Mines marching band.

Courtesy of Cathy Skokan

Excellence in College Teaching from the Colorado Association of Science Teachers, the Alfred Jenni Fellowship Award for Educational Scholarship, and the Gold Award from the Engineering and Environmental Geophysics Society. In 2010, Skokan became a research faculty member, regularly working on educational outreach

projects with the Trefny Institute for Education Innovation. "I've enjoyed working with teachers and trying to get them excited about science and engineering," she shares. "It's a really fun thing to do."

Skokan's involvement with the university goes far beyond the classroom. After earning her degrees, she continued her activities with the music program, becoming a temporary string conductor (until the orchestra became too large). Despite her recent retirement, she still plays violin in the orchestra, the bassoon in the band, and the urhu in the Chinese band. "I'm not going to give up the orchestra, nor the marching band, nor the Chinese band," she says. "The best thing about the school is, of course,

the students, so this way I still get to have fun with the students."

Skokan also travels frequently and organizes trips for the Mines music program, including the upcoming trip to Dublin, Ireland, during spring break in 2016. She also spends much of her time lecturing on cruise ships, educating passengers about geology and geophysics. In February 2016, she will travel to Indonesia to lecture on the country's earthquakes and volcanoes.

Skokan's "spare time" remains dedicated to what she loves, and she has no plans to give any of that up in the near future. Although she was the first woman to receive a PhD—or any sort of graduate degree—from Mines, she says it's not about the accolades, but about doing what she loves. Her advice for students following in her footsteps? "Do what you want to do and enjoy it. Because it is fun."

—Ashley Spurgeon

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ALUMNI NEWS



EDITOR'S NOTE

Are you looking for Class Notes? To fulfill readers' requests to increase magazine space for feature articles and other Mines stories, Class Notes are now listed exclusively online. Visit minesalumni.com/minesmagazine to see your classmates' latest accomplishments, employment changes, photos, and other updates.

To submit a marriage, birth, or other alumni news announcement for potential publication in the magazine, visit minesalumni.com/announcement.



ESTES PARK WEDDING Neil Smith '01 married Ashley Lock on September 27, 2014, in Estes Park, Colo. Other Mines alumni in attendance were David Weaver '02 (best man), James E. Johnson '03 (groomsman), Kevin Lock '10 (bride's cousin), and William "Bill" Smith '66 (groom's father). Neil is an environmental engineer with CDM Smith in Denver, and Ashley is a pediatrician with Kaiser Permanente.



BIKE RACING OREDIGGERS Jeff Jantos '03, MS '10, Andrea Ham '08, MS '11, and Christoph Hurley '10, MS '13 competed in the 2015 edition of the BC Bike Race (BCBR) in British Columbia, Canada. BCBR is a seven-day mountain bike stage race along the west coast of British Columbia that attracts over 600 competitors from 24 countries. Jeff didn't know Andrea and Christoph before the event and only made the Mines connection when he noticed Andrea sporting her Mines jersey at the end of the second stage of the race.



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MATCH MADE IN RANDALL HALL Ethan Blodgett '14 and Shannon Spokas '14 were married on July 18, 2015. The couple met during their freshman year at Mines when they both lived in Randall Hall. Ethan proposed on their graduation day. Orediggers who helped them celebrate were Eliza Porterfield '14, Alex Leroux '14, MS '15, Erich Kerr '14, and Brandon Sawada '14.



HAPPY FAMILY OF THREE Amy (Stokes) Bordonaro '12 and Anthony Bordonaro '12 announce the birth of their daughter, Bianca Maria Bordonaro. She was born on February 19, 2015, in The Woodlands, Texas.



CELEBRATING TWICE Katy Soto '03 married Brad Allen at the High Point, N.C., courthouse on May 15, 2015. They held a formal ceremony and celebration at their home in Oak Ridge, N.C., on October 18, 2015. Mines alumni in attendance were Shelley (Roth) McMullen '03 and Tammy (Foppe) Kaier '03.



TAU BETA PI'S MCDONALD MENTOR AWARD Orval "Rusty" Powell PhD '09 was selected as Tau Beta Pi's 10th McDonald Mentor. The engineering honor society's award recognizes Powell for his outstanding support of the personal and professional development of his cadets and fellow faculty at the United States Air Force Academy. The annual award celebrates

mentors and advisors among Tau Beta Pi educators and engineers who consistently support both the personal and professional developments of their students and colleagues.

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RESIDENT ASSISTANT WEDDING Brock Reesberg '10 and Rachel Reese were married on September 14, 2013 in Boulder City, Nev. The two met at a resident assistant conference in Tucson, Ariz., in 2007 and later reunited in Fort Worth, Texas, where Brock worked with Baker Hughes and Rachel worked at Texas Christian University. Orediggers in attendance included Tom Kastens '10 (groomsman), Donald Markley '10 (groomsman), T.J. Hanneman '10 (groomsman), Dana Hanneman '10, Cris Rogers '10, Kyle Goracke '11, Robbin Vinnola '10, Danielle Vinnola '09, Hunter Wardlaw '09, Brian Lincoln '10, Evan Woody '11, Jordan Smith '11, MS '12, Ricardo Mendez '11, Ashley Nagle '10, MS '11, Jordan Portillo '10, and Randy Anderson '10.



FROM CLASSMATES TO SWEETHEARTS

Katie Johns '11 and Andrew Renehan '11 were married on May 23, 2015. The couple met during their sophomore year at Mines when they were assigned to a group project in Professor Liberator's Materials and Energy Balances class. Sixteen Mines alumni and students attended the wedding, including Kelsie Dodson '11 (bridesmaid), Tyler Renehan (best man), and Matt Voget '11 (groomsman).

SLEEPING BEAUTY

Caitlyn (Stewart) Jackson '08 and Dwyatt Jackson '07 welcomed their daughter, Raegan Marie Jackson, on May 13, 2015. The new parents are overjoyed with their new baby girl.





A CHEMICAL ATTRACTION Kimberly A. See '09 and Maxwell J. Robb '09 were married in Pine, Colo., on August 8, 2015. They met as undergraduate students at Mines and both went on to receive their PhD degrees from the University of California, Santa Barbara in 2014. The couple currently resides in Urbana, Ill., where they are both postdoctoral researchers in the Chemistry Department at the University of Illinois at Urbana-Champaign. Mines alumni who attended the wedding included Tyler Benton '09 and Martin Gottlob MS '96.



A NEW LITTLE SISTER Jesse White '04 and Emily Bostwick-White '04 welcomed their daughter, Cadence Elaine Bostwick-White, on May 31, 2014. She joins her older sister, Aletheia.



FIREWORKS IN HOUSTON Elliott Dudley '09 and Amy O'Neil were married on March 7, 2015, in Conroe, Texas. Amy and Elliott met in Houston on the 4th of July after returning from Australia. Other Mines alumni who participated in the festivities included Scott Dudley '07, Anant Pradhan '09, Jimmy Mulligan '08, MS '10, Andrew Yule '11, Nate Anderson '07, Matt Hurliman '09, David Do '08, Matt Gilmer '11, MS '13, and Greg Metcalf '99.

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SNOWED-IN NUPTIALS Arianne Dean '09, MS '11 and Jeff Godwin '09, MS '12 were married at The Vista at Applewood in Golden, Colo., on May 9, 2015. The festivities were forced indoors due to the snow, but they were still able to celebrate with family and friends. Other Mines alumni who attended the wedding included Mark Godwin '09 (best man), Alan McCann '09, MS '10, Nickie McCann '09, MS '10, David C. Wilson '09, Chris Newby '09, MS '10, Tyler Benton '09, Scott Bromley '09, Jaime Bromley '10, Elise Goggin '09, Josh Elliott '09, Melissa TeBockhorst '09, and Tom Cullison '09, MS '11 (not pictured). The couple met as sophomores in the Geophysics Department and dated throughout their time at Mines before getting engaged at the top of Mt. Elbert in the summer of 2014.



CELEBRATING 103 John Tower '35 celebrated a milestone on August 21, 2015, when he turned 103. Family and friends helped him celebrate his birthday with a party in Dallas, Texas. Tower graduated from Mines in 1935 with his bachelor's degree in petroleum engineering. He joined the Army Air Corps before pursuing his engineering profession in Texas and has remained active throughout his life. When he was 60, he joined the Federal Defense Contracts Administration Service, working there until his retirement. He eventually returned as a contractor and continued to work until he was 97. He looks forward to celebrating his 104th birthday next year.



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Mines magazine is mailed four times per year to more than 28,000 alumni and friends. We rely on donations from readers like you to help cover the ever-increasing costs associated with publication management, printing, and mailing.

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IN MEMORIAM

“When you are sorrowful look again in your heart, and you shall see that in truth you are weeping for that which has been your delight.”

—Kahlil Gibran



ROBERT W. BLAIR, JR.
PhD '75 died February 26, 2015. He was born in Bossier City, La., in 1943 and received his bachelor's degree in geology from the University of New

Mexico. He served in the U.S. Navy for two years before receiving his PhD in geology from Mines in 1975. Rob taught for 28 years in the Geosciences Department at Fort Lewis College in Durango, Colo. After his retirement in 2001, he remained active at Fort Lewis College and initiated the formation of the Mountain Studies Institute, an independent non-profit mountain research and education center established in 2002 in Silverton, Colo. Rob was also an active member of the Association of Independent Professional Geologists, Geological Society of America, American Geophysical Union, Four Corners Geological Society, National Association of Geology Teachers, Friends of the Pleistocene, and the Professional Associates of Fort Lewis College.



WILLIAM H. BOUSMAN
'42 died March 6, 2015. Born in 1919 in Denver, Colo., he graduated from Mines with a professional mining engineering degree in 1942. He

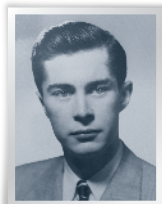
then served in the U.S. Army Corps of Engineers during World War II. After his army service, he was a draftsman for the Pan American Engineering Company, where he was involved in the design of mining machinery. William joined Stearns-Roger in 1947, designing and overseeing the construction of power plants. An avid golfer, he was a

member of the Pinehurst Country Club, the Rio Verde Country Club, and the Senior Golfers Association of America. He also belonged to the Colorado Society of Engineers.



BARTHOLOMEW BURNS
'52 of Plymouth, Mass., died September 19, 2015. Born in 1925 in Boston, Mass., he served in the U.S. Army Air Corps from 1943-1945 as

a navigator on a B-17. Following his service, he attended Boston College for two years before transferring to Mines, graduating with a professional mining engineering degree in 1952. Bart worked extensively in mining in Arizona and Ecuador and built a water treatment plant in the Panama Canal Zone. He then returned to the United States, where he helped build several sports stadiums. He was a member of the Elks, the Knights of Columbus, and the John Alden Sportsman's Club. Bart was also a life member of the Mines Alumni Association and a member of the President's Council.



ROBERT B. COLEMAN
'49 died August 29, 2011, in Lakewood, Colo. He was born in 1927 and graduated from Mines in 1949 with a degree in metallurgical

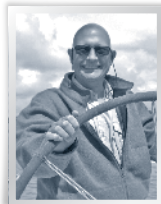
engineering. As a student, he was a member of the Beta Theta Pi fraternity. After graduating from Mines, Bob became a plant operator at Vanadium Corporation of America in Durango, Colo. He later held engineering and managerial positions with FMC Corporation and Vitro Corporation.

He joined Hazen Research in 1970 and was later named vice president before retiring in 2002.



BRYAN N. COONEY
died June 21, 2015. Born in 1920 in Eliasville, Texas, he was drawn to music, becoming a high school band director before accepting the

position of supervisor of music for the community of Brazosport, Texas. When he retired in 1974, he followed his passion for invertebrate fossils and became the curator of the paleontology collection for the Department of Geology and Geological Engineering and the Mines Geology Museum. He held this position for 21 years until he retired in his late 80s. In 2005, Bryan was awarded the Mines Medal for his dedication to the school. He also founded what would become the Western Interior Paleontological Society and was a research associate at the Denver Museum of Nature and Science.



LLOYD WRIGHT EASTON
'89, MS '93 died October 9, 2014, in Scottsdale, Ariz. Born in 1966 in Redwood City, Calif., he received his bachelor's degree in electrical engineering

in 1989 and completed a master of science degree in applied mechanics in 1993. While at Mines, he was a member of the ski team, and he received the Outstanding Graduating Senior in Electrical Engineering award in 1989. After graduation, he worked with Bechtel Corporation for 12 years before founding EPC Integration, a software development company, in London.



To submit an obituary for publication in the magazine, visit minesalumni.com/obituaries.

**GEORGE L. FREELAND**

'53 died April 17, 2015.

George was born in 1931 and received his geological engineering degree from Mines in 1953. As a student, he was a member

of the Sigma Phi Epsilon fraternity and ROTC. He was a First Lieutenant in the U.S. Army Corps of Engineers from 1954 to 1956 before becoming a geologist in the Exploration Department of Shell Oil in Houston, Texas. After receiving his PhD in geology in 1971, he became an adjunct professor at the University of Miami and a senior research oceanographer for the U.S. Department of Commerce, the National Oceanic and Atmospheric Administration, the Atlantic Oceanographic and Meteorological Laboratory, and the Marine Geology and Geophysics Laboratory in Miami, Fla. George was the co-founder and vice president of Biscayne West, Inc. and the founder and president of Biscayne Exploration, Inc. In 1987, he was appointed to the Board of Professional Geologists by the Governor of Florida. George was also a member of Mines' Heritage Society and the President's Council.

**JAMES H. GARY**

died June 8, 2015. Born in

Victoria, Va., in 1921, he was a professor emeritus of chemical engineering at Mines, teaching for 26 years, and head of the

Department of Chemical Engineering and Petroleum Refining from 1960 to 1972. From 1972 to 1979, he held the position of Vice President of Academic Affairs and Dean of Faculty. He also served as a director and trustee for the Mines Research Institute from the early 1970s to the early 1980s. On May 16, 1992, James received an honorary membership from the Mines Alumni Association for his 31 years of dedicated service to the school and its students. He was also a fellow of the American Institute of Chemical Engineers and was an internationally recognized scholar, teacher, and leader in the area of petroleum and shale oil processing. James founded the Oil Shale Symposium and served as its director. In 1995, James and his wife established the James H. and Jane Z. Gary Endowed Scholarship Fund, providing financial

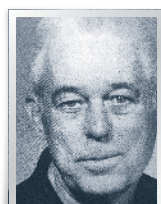
aid to Mines students pursuing an option in chemical engineering and petroleum refining.

**ELOISE A. GOLDEN**

'79 died May 2, 2015.

Eloise was born in Great Lakes, Ill., in 1957 and graduated from Mines in 1979 with a degree in metallurgical engineering. After

graduation, she moved to Arizona where she began her career as a metallurgist, working for the Inspiration Consolidated Copper Company. She worked for 19 years in the mining industry, living in Alaska, Arizona, and Nevada as an expert in the extraction of copper and gold from ore. She eventually made a career change, becoming the owner of The Chuckhole Café in Grand Lake, Colo., in 1998. In 2006, she married Patrick Golden and became the manager for his medical practice. Eloise performed community services for organizations such as Girl Scouts, Fresno Women's Network, and St. Agnes Mission Church in Pinedale, Calif.

**PAUL A. JOHNSON**

'51 died July 16, 2014,

in Ocala, Fla. Born in Springfield, Mass., in 1921, Paul received his mining engineering degree from Mines in 1951. After graduation,

he worked for Goodman Manufacturing Company until 1959, when he moved to Chicago, Ill., to work at the company's headquarters. In 1962, he was hired by the International Minerals and Chemical Corporation to supervise equipment maintenance in Carlsbad, N.M. He was then transferred to the company's corporate headquarters in Skokie, Ill., where he worked in the Materials Handling Division. Paul moved to Ocala, Fla., after retiring in 1986.

**JOHN P. LOCKRIDGE**

'52 died September 7, 2015,

in Pebble Beach, Calif. John was born in 1931 in Marshall, Mo., and earned his professional degree in geological engineering from Mines

in 1952. As a student, he was a member of the Beta Theta Pi fraternity, the varsity basketball team, and the varsity swimming and diving team. In 1952, John began his career as a junior geologist with

General Petroleum, a subsidiary of Mobil Oil. After he left Mobil Oil, he opened a Denver office for Koch Industries; shortly thereafter, he started his own company, Mountain Petroleum, Ltd. In 1982, John was awarded the Distinguished Achievement Medal from Mines, and he became an Honorary Member of the Mines Alumni Association in 1997 for his dedication and support to Mines and the Geology and Geological Engineering Department. He was also a member of Mines' Century Society, a charter member of the President's Council, and a founding member and director of the Mines Foundation Board of Governors. Read more about John Lockridge on page 28.

**C. DAVID MANN**

'56 died July 21, 2015. Born

in 1933 in Grass Valley, Calif., he earned his professional degree in mining engineering from Mines in 1956. After graduation, he worked

at St. Joe Lead Company in Missouri as a mine research engineer, later moving to Sullivan, Mich., where he became head mining engineer at an iron mine. In 1977, he moved to Texas to work for Exxon Minerals Company. He eventually moved to California in 1987, where he worked as a project manager for Parsons Brinckerhoff in San Francisco, primarily on underground storage of spent nuclear fuel rods and other radioactive materials. He retired in 1998.

**KENNETH W. NICKERSON**

'48 died April 29, 2015,

in Port Charlotte, Fla. Ken was born in 1920 in San Antonio, Texas. He received his geological engineering degree from Mines in 1948. As

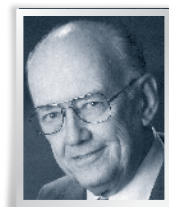
a student at Mines, he was a member of the Alpha Tau Omega fraternity and played basketball, baseball, and football. After three years at Mines, he enlisted in the U.S. Coast Guard Merchant Marines during World War II and returned to Mines to complete his degree when he was discharged. Ken worked as a geologist for various companies over the years, eventually ending up at Royal Resources (later known as Royal Gold, Inc.) where he served as president, director, and chief operating officer for 10 years. He also worked as an independent engineering consultant to mining companies, traveling all over the world.

In addition, he served as a director of the Colorado Mining Association from 1979 to 1982 and as a director of the Colorado National Bank in Golden, Colo. Ken was a member of the Colorado Mining Association; the American Institute of Mining, Metallurgical, and Petroleum Engineers; the American Association of Petroleum Geologists; and the Rocky Mountain Association of Geologists. He also received an honorary membership from the Mines Alumni Association and was a life member. Ken retired in 1989.



THOMAS W. OLSEN '74 died February 21, 2015. Born in 1952 in Omaha, Neb., he received his bachelor's degree in geological engineering from Mines in 1974.

As a student, he was a member of the band and a resident assistant. He was also a member of Blue Key, Kappa Kappa Psi, and Tau Beta Pi Honor Societies. From 1974 to 1976, he worked as a geologist for Cities Service Oil Company before joining Tenneco Oil Company as a geological engineer. He went on to work for James A. Johnson, Inc., and Quinton Little Co., Inc. In May 2012, Thomas received an Honorary Life Membership from the Ardmere Geological Society. He was also a member of the Mines President's Council.



FRANK J. QUINN JR. '48 died March 18, 2015. He was born in 1923 in Denver, Colo., and attended Mines for two years before enlisting in the Army. After serving in New

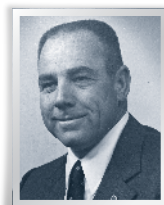
Guinea and Japan during World War II, he

returned to Mines and received his degree in metallurgical engineering in 1948. As a student at Mines, he was a member of Tau Beta Pi. After graduation, he worked at the Hanford Nuclear Reservation in Washington before moving back to Denver with his family, where he worked at Rocky Flats for 32 years.



EDWARD S. RYAN '49 died February 2, 2015. Born in 1923 in Burlington, N.J., he attended Duke University before joining the U.S. Army in 1942. He

received his "silver pilot" wings and a commission as a Second Lieutenant in the U.S. Army Air Corps Reserve. In 1946, Ed moved to Colorado and received his geological engineering degree from Mines in 1949. While at Mines, he was a member of the Sigma Nu fraternity. He spent 31 years as a geologist with the Shell Oil Corp., specializing in the Gulf of Mexico. Ed also remained in the Air Corps Reserve, serving for 42 years before retiring as a major in the U.S. Air Force Reserve.



JAMES D. SELL '55 died February 18, 2011, in Tucson, Ariz. Born in 1930, he served as a U.S. Army Radio Operator in the Korean conflict and was awarded the Korean

Service Medal with two bronze stars. After his service, he graduated from Mines in 1955 with a bachelor's degree in geological engineering. Jim traveled to many places around the world as an exploration geologist specializing in

porphyry copper deposits. He retired after 32 years with ASARCO. An active member of the Arizona Geological Society and the American Institute of Mining, Metallurgical, and Petroleum Engineers, Jim coordinated and spoke at many geology field trips, explorations, tours, and events in the Southwest U.S. He was also a member of the Society of Economic Geologists and the Mines President's Council.



W. GORDON WIEDUWILT '53 of Tucson, Ariz., died August 18, 2015. He was born in 1927 and served in the U.S. Army, later attending Mines on the GI Bill. He

graduated with a degree in geophysical engineering. As a student, he was a member of the Sigma Alpha Epsilon fraternity, the varsity cross country team, and the tennis team. He began his career working for Newmont Mining and Canadian Aero Surveys, prospecting for mineral deposits around the world. In 1970, he opened Mining Geophysical Surveys in Tucson, Ariz., specializing in electrical and gravity surveys for the mineral industry for more than 25 years. He was active in the Mining Club of the Southwest and the Society for Exploration Geophysicists. Gordon was also very involved with the Mines Alumni Association, serving as Director of the Southwest Region in the 1980s and as an officer and committee person for the Tucson section. He was also a member of the Mines President's Council.

—Compiled and written by
Jo Marie Reeves and Ashley Spurgeon

ALSO REMEMBERED

FAROUK M. ALLAM PhD '79.....	March 16, 2011
RICHARD A. ALEXANDER '86.....	June 15, 2012
HARRY L. BEVERS '49.....	July 21, 2012
JOHN H. CREDE '35.....	December 30, 2011
EUGENE L. CURRENT '40.....	June 3, 2011
JOHN D. DAKIN '51.....	March 1, 2012
JACK A. EVANS '74.....	July 15, 2012
JOHN A. FRAHER '44.....	October 15, 2012
WILLIAM K. HUNTER '47.....	December 2, 2012
WILLIAM B. KAYS, JR. '49.....	May 9, 2011

DREXEL L. LEE '52.....	January 31, 2011
ALVIN F. "AL" MALOIT '47.....	November 27, 2012
ROBERT J. MALOIT SR. '37.....	November 9, 2014
JACK L. MATAYA '41.....	February 20, 2012
WILLARD A. MAXEY '52.....	March 31, 2012
ROBERT P. MURRAY '51.....	April 25, 2011
ROBERT T. REHTMEYER '42.....	February 21, 2011
RAYMOND SHUCAVAGE '53.....	February 25, 2011
FLOYD E. SNYDER '64.....	January 24, 2011
CLARK L. THOMAS '41, MS '42.....	November 21, 2012
DAVID A. WOLFE '67.....	February 23, 2011

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MINER'S PIC



OREDIGGER VISTA

Mines student Carlita Gorham (mechanical engineering, Class of 2019) says her two favorite things about Mines are the “wonderful people who go to school here” and all the activities she can do, like hiking, rock climbing, and camping.

Last fall, she climbed to the top of Table Mesa to get a bird’s eye view of campus and the Golden area. “I hike up South Table Mesa a lot, because it’s an easy short hike, and it has a great view,” she said. “I had noticed the view from this cliff during a previous hike, and I decided it would make a great photo.”



Interested in having your photo featured on the Miner’s Pic page of *Mines* magazine? We’re looking for unique and artful shots taken by or featuring Mines alumni or current students. Submit your photo for consideration via our contact form at: <http://minesmagazine.com/contact-us/>.

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February 9

Golden, CO

Meet the Johnsons

February 17 – 19

San Francisco Bay Area, CA

Mines in Motion

Coming in February

Phoenix, AZ

Meet the Johnsons

March 9 – 11

Washington DC & NYC Area

**Spring Break Trip with
Mines Music Department**

March 10 – 19

Dublin, Ireland

26th Annual Bone Valley Picnic

March 13

Bone Valley, FL

Houston Area Alumni Reception

April 21

Houston, TX

**16th Annual Houston Endowed
Scholarship Golf Tournament**

April 22

Houston, TX

Mines in Motion

Coming in April

Portland, OR

Santa Fe/Albuquerque, NM

Meet the Johnsons

May 5

Oklahoma City, OK

**7th Annual Oklahoma Endowed
Scholarship Golf Tournament**

May 6

Edmond, OK

Spring Commencement

May 12 – Graduate Ceremony

May 13 – Undergraduate Ceremony

Golden, CO



Grand Canyon Rafting Adventure

May 21 – 29

Grand Canyon, AZ

Mines in Motion

Coming in May

Bakersfield, CA

San Diego, CA

**2nd Annual Dallas
Golf Tournament**

June 3

Dallas, TX

**32nd Annual Golden
Golf Tournament**

June 6

Golden, CO



**Annual Oredigger Athletics
Golf Tournament**

July 11

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