

Bypassing Hoover Dam

Q & A with NSF Director

Giving Hard-Won Wealth Away

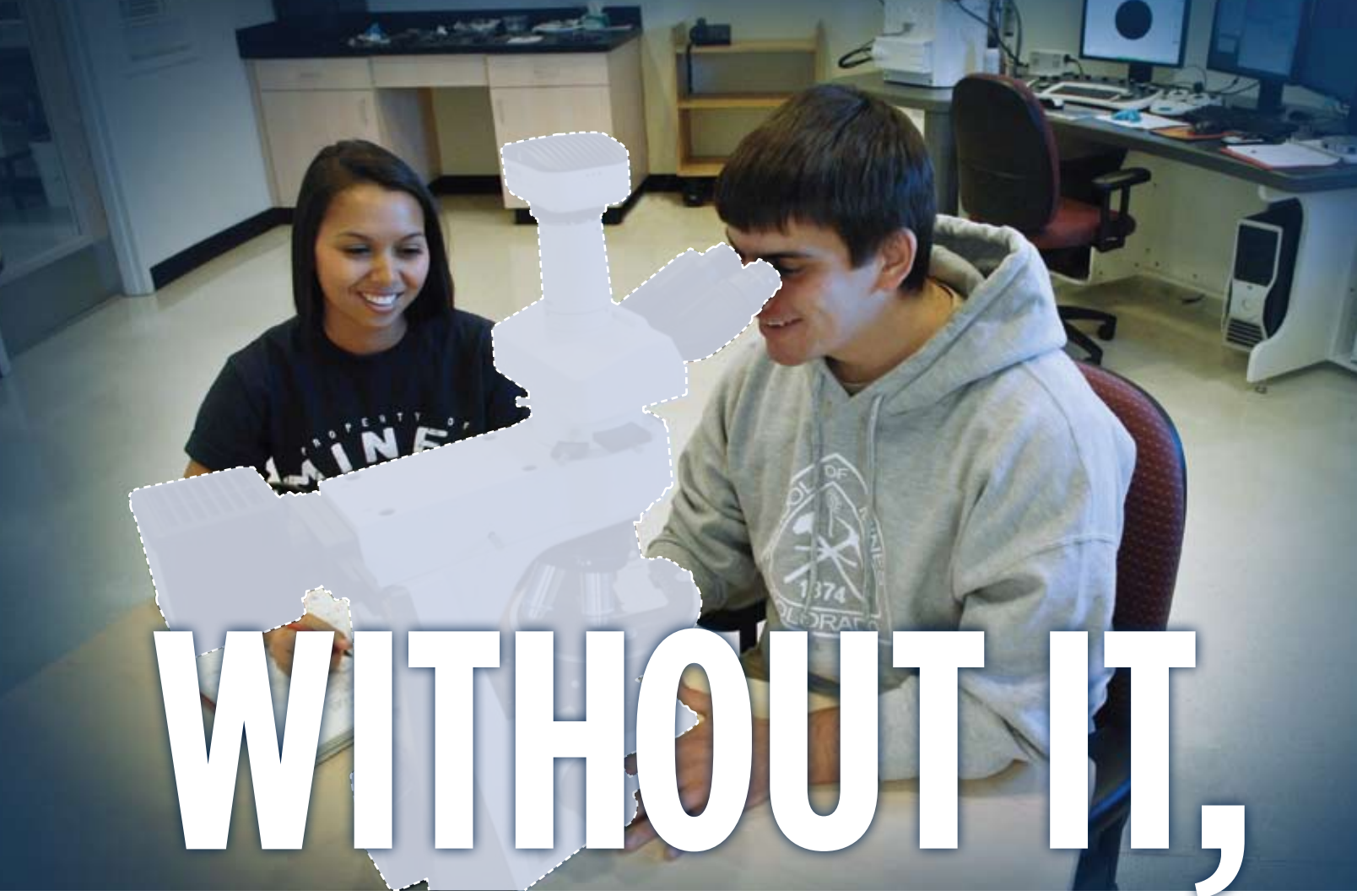
Fall/Winter 2010 Volume 100 Number 3

Mines

Colorado School of Mines Magazine

*Mines Magazine
Turns 100*





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Cover: One hundred years after it was published, the first issue of *Mines* magazine can be viewed online, as can more than 100 issues from our archives. The searchable PDF documents can be found on our newly updated magazine website: magazine.mines.edu.

Photography: Shutterstock.com. Photo illustration: Craig Korn.

Federal Oversight of Hydraulic Fracturing

Jim Classen's letter in the summer issue of *Mines* opines that EPA regulation of hydraulic fracturing isn't necessary, because it is already policed by state agencies. However, his reasons for why groundwater contamination is improbable do not square with what has been widely reported from a number of different sources.

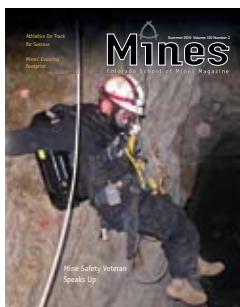
In particular, hydraulic fracturing in the Marcellus Shale formation, which extends from upper New York State through Pennsylvania, West Virginia, and Ohio, has resulted in a number of lawsuits claiming contamination of drinking water wells, plus surface contamination. A number of well-regarded studies seem to confirm this. New York State is so concerned that the legislature recently enacted a moratorium on this process.

Unfortunately, the extractive industries have a poor environmental track record of creating problems and walking away, leaving local communities and taxpayers to pay millions of dollars for environmental cleanup. Sometimes, such problems are so huge that there simply doesn't seem to be a solution—think Iron Mountain in Northern California, mountaintop removals in West Virginia and uranium tailings in the Four Corners area.

Industry always argues that no oversight is needed because they will be responsible citizens and leave a site cleaner than before, but experience proves otherwise: BP argued for years that deepwater drilling regulations were excessive, and Massey Coal repeatedly claimed that the federal Mine Safety and Health Administration was too zealous and intrusive. I strongly suspect the families of the 25 miners killed earlier this year feel the MSHA didn't go far enough.

States frequently lack the manpower or funding to ensure that rules are being followed. And in many cases, state legislatures are easy marks for industry lobbyists working to keep meaningful regulations from being passed. Even at the federal level these same lobbyists are very powerful.

As citizens, it's ultimately our responsibility to make sure that we aren't passing environmental problems on to our children and



future taxpayers to fix, and there is enough uncertainty around hydraulic fracturing that federal oversight is warranted.

Ian Berke '64

Thank you, Nick. Copy received and read cover to cover. Your editorship is producing a very professional work. My wife is a DU graduate and I see her copy of the Alumni magazine—yours is far superior.

Morgan T. Townsend '48

From Bierstadt Donor's Grandson

We received the note you sent with the copy of *Mines* magazine that included the article about the Bierstadt painting. The story of Benjamin Briscoe giving the painting to the school in 1938 is well known in our family. He was an interesting man. Before getting into mining later in his life, he invented the Briscoe car, which became the Maxwell and was eventually sold to Buick.

We are very happy that the painting is being seen. I'm planning on taking my mother, Pauli, to the museum to see it restored. She was ten when her father made the donation to Mines. Several years ago, the president had my parents, aunt and uncle down to view it on the Colorado School of Mines campus. It's great that it's there at the Denver Art Museum, and thank you so much for thinking of us and sending the magazine along. We appreciate it very much.

Peter Werlin, Georgetown, Colo.

Editor's Note: Many thanks to Lil Bradley for providing contact information for Briscoe's family in Georgetown. After receiving this message, we found a Wikipedia entry on Benjamin Briscoe that more than supports Peter Werlin's claims; according to the information there, Briscoe was a true pioneer of the auto industry.

More on Bierstadt Restoration

The impetus for the Bierstadt collaboration between Mines and the Denver Art Museum began at a lunch in early December, 2008, for my impending retirement as acting director of technology transfer. During the lunch, it was mentioned that the school had a valuable painting by Bierstadt and that President Scoggins felt that it needed to be restored and put on display for

a wider audience.

By sheer coincidence, a Mines/DAM partnership in which I participate was meeting at the Geology Museum the very next day. An appointment to view the painting was made and President Scoggins generously took the time to discuss it with us.

After establishing authenticity, DAM staff said they would be pleased to have the painting on loan from Mines to display in their forthcoming "Western American Art" exhibit. Furthermore, DAM conservators would restore the painting at no cost to the university.

Ironically, in the same week, the U.S. Postal Service issued a commemorative postage stamp in its "American Treasures" series honoring Bierstadt with a painting of Yosemite almost identical to the Mines painting, with one notable exception: the Mines Bierstadt has the spectacular waterfall in the right side of the canvas. In fact, of the many known landscapes of Yosemite painted by Bierstadt, this is the only one which combines this magnificent view of the famous domed valley with a waterfall.

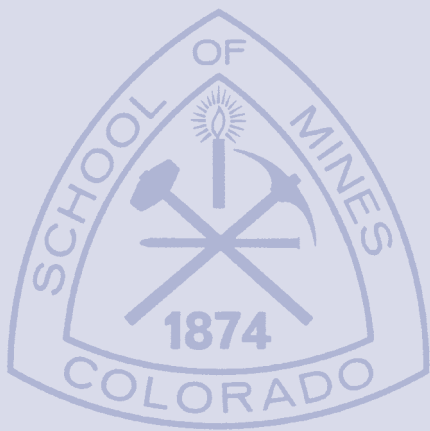
With that intriguing mystery in mind, I contacted Kenny Karst, who works for the company that manages Yosemite Park. He identified all of the famous points in our Bierstadt (see photo at magazine.mines.edu) and provided a topographical map labeled with these same points, suggesting a possible vantage point for the painter (viewable online).

The waterfall is not "fictitious" [as was claimed in the *Mines* article]; Bierstadt merely created his own tectonic forces, showing the Upper and Lower Yosemite Falls several miles to stand right next to the Three Brothers and the famous El Capitan peak, throwing in an ancient lake and swirling clouds in the middle of the valley to create a dramatic and very marketable landscape.

So it is thanks to President Scoggins's acumen and perception, and the skilled efforts of the DAM staff, the people of Colorado can now view the Mines Bierstadt in the original 19th century brilliance and color.

**Fred Fraikor
Research Professor (retired)**

Editor's Note: This is a much shorter and significantly edited version of Fred Fraikor's original letter. To read his original text, and to see the photographs and maps referenced, please go to magazine.mines.edu.



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Visit the *Mines* magazine web site at
magazine.mines.edu

Dear Readers,



What a tremendous testament to the dedication and work ethic of generations of Mines graduates that the Colorado School of Mines Alumni Association—a membership-based and volunteer-led organization—has now kept *Mines* magazine in print for 100 years. I hope you'll take a few minutes to read Part I of the 100-year retrospective included in this issue; I also encourage you to visit the newly-updated magazine website (magazine.mines.edu) where you can look through more than 100 issues of *Mines* magazine in searchable PDF format, taken from throughout the last century.

Turning to a major accomplishment in the present era, the Hoover Dam Bypass Bridge—described by many as a new national landmark—will already be familiar to many after it received national media attention in October when it opened. What may be less well-known to readers is that the six-year project was led—start-to-finish—by Mines alumnus, Dave Zanetell '87. "Constructing a Landmark" tells his story.

Shortly before Arden Bement '54 stepped down as director of the National Science Foundation in May, he spoke with *Mines* magazine. We bring you highlights of our conversation, which included the personal, the professional and his forward-looking perspective on issues of national and global concern.

Many know of Tim Marquez '80 in connection with his philanthropy: in 2005 he and his wife, Bernie, pledged \$10 million for a new building for Mines' Petroleum Engineering Department; in 2006, their \$50-million gift helped establish the Denver Scholarship Foundation. In addition to detailing the Marquezes' philanthropy and motivations for giving, this article traces Tim's intriguing and turbulent career.

The profile of Eric Friedland '87 chronicles another intriguing and turbulent career. He's doing well now, having struck upon what may turn out to be one of North America's largest diamond mines, but he's seen some challenging times.

If you are wondering how you can make a difference in 2011, you might find inspiration in the profile of Durga Prasad Kar MS '02, PhD '10. After growing up in rural India, he is now operating a non-profit dedicated to improving life for villagers in his home country. In a similar vein, Spotlight includes an article about two graduate students who have launched a non-profit organization to support educational initiatives in Cameroon.

In *Inside Mines*, we look at what a Mines degree is worth; it turns out you can't do much better if the metric is return on dollars invested, according to a *Bloomberg Businessweek* article. We also report on the Geology Museum's newly acquired moon-rock exhibit, a senior design project that was implemented by the Colorado Department of Transportation, and how the school is honoring the legacy of former Mines trustee and dean of student affairs, Mike Nyikos. *New Frontiers* explores how the BP oil spill has prompted new research on gas hydrates. And finally, in *Scoreboard*, find out what a great start the Orediggers have had this year.

If the nature and relevancy of the alumni association is something you question, then I'd encourage you to read Julia Hoagland's message in *Network*. Adding my own thoughts to her message, with CSMAA's membership drive in full swing, please remember that it is this source of revenue that largely sustains this publication. If you are looking for a reason to take action, consider taking out a membership in honor of *Mines* magazine's 100th anniversary. Your support will be most appreciated.

Your interest in *Mines* magazine is also appreciated. Thank you for taking the time to read; and consider taking some time to write a response to something you read here—the new *Mines* magazine website provides plenty of opportunities to share your thoughts and engage in dialogue with other readers.

On behalf of everyone at the alumni association, I wish you a happy and healthy start to 2011.

Sincerely,

Nick Sutcliffe

P.S. We will be sending out a readership survey soon via email. If we don't have your email, please provide us with an update on minesonline.net, or simply send a message right now to magazine@mines.edu with "Email Update" in the subject line. And please take a moment to respond when the survey arrives. Your participation will be greatly appreciated.

Campus News

What Is a Mines Degree Worth?

In a recent PayScale.com study of 554 U.S. schools offering bachelor's degrees, Colorado School of Mines was ranked first among public institutions for 30-year net return on investment for graduates who paid in-state tuition, and second in the same category for graduates who paid out-of-state tuition. The data was analyzed in an article published in *Bloomberg Businessweek* in June 2010 titled "College: Big Investment, Paltry Return." The study has Mines tied with Harvard at No. 6 for 30-year net return on investment for graduates—ahead of Yale, Princeton, Duke, Rensselaer Polytechnic Institute and UC-Berkeley. And because the in-state cost of attending Mines is so much less than the private universities with which it was ranked, Mines was identified as the best value out of all schools in the study.

The PayScale study is based upon data from 1.4 million reports collected from their own online pay comparison tools. Bachelor's degree recipients from U.S. universities and colleges who were employed full-time in the U.S. were included in the study; recipients of advanced degrees were left out. The study

performed separate calculations to account for the differential between in-state and out-of-state tuition at public universities.

Among students paying in-state tuition at public universities, Mines was ranked second in the study's most prominently featured category—30-year net return on investment. Aimed at evaluating return on all student investments, whether a degree was granted or not, this value was calculated by multiplying the 30-year net return for graduates by the average six-year graduation rate. With a 77 percent six-year graduation rate, UC-Berkeley came in slightly ahead of Mines, which has a 68 percent graduation rate according to Payscale's data.

Since private colleges generally have much higher graduation rates than public universities, Mines dropped down the overall rankings in this category: while Harvard's graduation rate of 98 percent pushed it up to No. 3 for 30-year net return on investment, Mines dropped to No. 27 for in-state students and 32 for out-of-state students.

The study listed the in-state cost to graduate from Mines at \$95,740, and the 30-year net ROI at \$1.1 million—an annualized net ROI of 13.6 percent. Massachusetts Institute of Technology was ranked first with an ROI of nearly \$1.8 million, which translates to an annualized net ROI of 12.6 percent.

Graduates are usually more concerned with their immediate futures than 30 years out. According to Payscale's 2010–11 college graduate salary statistics, Mines graduates' median starting salary is \$61,600, and by mid-career, median salary is \$113,000.

Students looking for that first job out of college can get a good read on the marketplace at job fairs. A record 3,100 students and alumni attended fall Career Day on Sept. 14, 2010, at the Student Recreation Center. Jean Manning-Clark, director of Mines' Career Center and employer relations, says the event sold out. There were 187 recruiter booths and four resume drops for 178 organizations. The spring Career Day event will take place Feb. 8, 2011.

—Brenda Gillen

Links to the *Businessweek* study, published in June 2010, can be found on the Mines magazine website at magazine.mines.edu.



Students Design Award-Winning Sound Wall

When Sue McMahon steps into her backyard in Lakewood, Colorado, these days, it's a lot quieter than it used to be. She credits this to an award-winning sound-wall designed by Mines engineering students that has reduced traffic noise from Sixth Avenue that abuts her property.

"They researched it, and they did a good job," says McMahon. "This is something that homeowners can afford, that will look decent and will still work. We are so excited about this."

In 2001, when the speed limit on Sixth Avenue was raised, traffic noise increased. In 2006, when the road was repaved, McMahon was able to convince the Colorado Department of Transportation to follow the suggestion of another team of Mines engineering students to use a stone-matrix asphalt that reduces traffic noise by about 5 decibels. It helped, but she knew more could be done.

With the support of Sen. Moe Keller, McMahon secured a \$224,000 Advanced Technology Grant for construction of an experimental sound wall that was composed of 15 percent shredded used tires—the grant tapped into funds from tire recycling programs. Since Mines students had come up with the repaving idea, McMahon contacted David Muñoz, an associate professor of engineering at Mines.

In 2008, students in the two-course Senior Design class took pre-construction noise level readings and then went about designing 750 feet of the 1,050-foot sound wall along the frontage road. It would be 8 feet high and would adjoin a 300-foot-long CDOT sound wall that also incorporated recycled tires. Muñoz advised the student team, which included Kurtis Greenman '08, Tony Gargaro '08, Steve Schneider '08, Trevor Mascovich '08 and Brad Bettag '08.



Bettag says since team members were only working on the north side of Sixth Avenue, they worried that the wall would amplify sound on the south side. "To account for that, we wanted to angle our wall upward at a slight angle to reflect sound over Red Rocks Community College on the south side of the highway. From there we incorporated the angles in an aesthetically pleasing way and alternated them to get some sound cancellation and wave interference," says Bettag. "By thinking one or two steps ahead, we saved the city from having to do additional mitigation on the other side of the freeway."

After construction was completed in spring 2010, the project, which used 3,330 recycled tires, won the 2010 City of Lakewood Community Sustainability Award.

Top to bottom: the sound wall viewed from across Rt. 6; rubber content of concrete promotes sound absorption, while non-uniform deflection surfaces diffuse sound waves and direct upward; (left to right) Kurtis Greenman '08, Tony Gargaro '08, Steve Schneider '09, MS '10, Trevor Mascovich '08, Michael Katz (contractor), Brad Bettag '08, Gary Collaizzi '70 (assisted with project).



—Brenda Gillen



Moon Rock Lands at Mines

The Mines Geology Museum recently became home to a rare moon rock, long thought to be missing. Its value estimated at more than \$5 million, the specimen was one of 360 rocks to come back to Earth in 1974 aboard Apollo 17, the sixth and final lunar landing mission of the Apollo program. President Richard Nixon awarded each state and 160 countries a set of two goodwill moon rocks. Of the two rocks Colorado received, one is on display at the State Capitol, and the other was recently found to be in the care of former Gov. John Vanderhoof. The moon rock's discovery made news when a graduate student at the University of Phoenix, working with that institution's ongoing Moon Rock Project, traced the sample to Vanderhoof.

At the ceremonial unveiling of the new exhibit, Gov. Bill Ritter thanked the university for putting the specimen on public display, saying, "Residents, visitors and students alike will now have an opportunity to learn and be inspired by this new moon rock display."

Admiral Richard Truly, a Mines trustee and former astronaut, joined President Scoggins and the governor in welcoming the historic exhibit to campus. Truly served as a NASA astronaut from 1969 to 1983, supporting all three of the manned Skylab missions in 1973 and the Apollo-Soyuz mission in 1985. Truly first flew into space in 1981 as a pilot of the space shuttle *Columbia*, and in 1983 he was commander of the *Challenger* for the first night launch and landing of the space shuttle program. After the *Challenger* disaster in 1986, Truly was placed in charge of the investigation and of getting the program back into space. He served as a NASA administrator from 1989 to 1992.

"Of all the NASA programs, it's Apollo that is the magic moment," said Truly. "It occurred in a decade when not much good was going on in our country ... But one magical thing that was going on was that for the first time humans were leaving the Earth. That a piece of the lunar soil that was picked up by Apollo 17, the final mission to the moon, is now here at the Colorado School of Mines Museum ... is just a marvelous occasion."

—Trisha Bentz Kendall



Clockwise from top left: close up of moon rock exhibit; Governor Bill Ritter (L) and museum curator, Bruce Geller, unveil the moon rock; Admiral Truly speaks at unveiling.

In Brief...

Mines Trustee **Vicki J. Cowart** MS '77 has been named the 29th recipient of the Medal in Memory of Ian Campbell for Superlative Service to the Geosciences. Cowart was presented this prestigious award at the Geological Society of America Presidential Address Ceremony in October. She worked in the industry for 16 years and served as the Colorado state geologist from 1993 to 2003. Cowart holds a Distinguished Achievement Medal from Mines.

Mines was awarded a \$2.3 million grant from the **National Science Foundation** to develop the Dynamic Atom Probe—the first instrument of its kind to enable 3-D imaging and chemical identification at the atomic level with ultrafast

New Tradition Honors Longtime Friend of Mines



Mike Nyikos

After defeating RMAC rival Mesa State College 46 – 10 on October 16, the Orediggers took home a newly minted award – the Nyikos Cup. Named in honor of Michael S. Nyikos, chairman and longtime member of the Mines Board of Trustees, the award will go to the winner of the football game between Mines and Mesa State each year.

Nyikos was something of an institution on campus, beginning his tenure as dean of student affairs in 1979, and later serving as vice president of student affairs and external relations. He was a vocal advocate for Mines' mission and strong supporter of its students. During his career at the school, he helped secure funding for renovations to virtually every academic building, and he helped expand the school's athletics facilities.

At the time of his death last February, Nyikos was serving as chairman of the board of trustees and secretary of the CSM Foundation's board of governors. In addition to his many years of service to Mines, Nyikos was a former vice president of institutional advancement for Mesa State and in retirement had served on the President's Advisory Committee for that institution.

The award was announced by the alumni associations of both schools at the Rocky Mountain Athletic Conference fall

meeting in October. A joint statement from President Scoggins and Mesa State President Tim Foster reads, "The Nyikos Cup is significant because it is inspired by the devotion of Dr. Nyikos to higher education, his contagious enthusiasm, spirit of fun and sportsmanlike conduct in every area of his life. This—much more than winning or losing—is behind this very special tribute to a very special man."

—Trisha Bentz Kendall



CSM President Bill Scoggins (L) and Mesa State President Tim Foster

time resolution. The probe will allow researchers to determine how materials behave at high temperatures and voltages, enabling them to develop next-generation metal alloys for low-cost, high-efficiency devices like computer processors.

D. Vaughan Griffiths, civil engineering professor, was elected in October as director of Region 7 of the American Society of Civil Engineers, America's oldest national engineering society, which represents more than 144,000 civil engineers worldwide. His new role places him on ASCE's governing board.

Azra N. Tutuncu, the Harry D. Campbell Chair in the Petroleum Engineering Department, is the new director of Mines' Unconventional Natural Gas Institute (UNGI). Tutuncu has expertise in well engineering, rock physics, geomechanics, and subsurface research and development groups; she has held leadership positions at Shell International Exploration and Production Company and Shell Oil Company.

Mines hosted the **30th Oil Shale Symposium** Oct. 18, the premier international conference on the development of oil shale. More than 250 delegates from all over the world attended. At the opening session,

Estonian Minister of Economic Affairs and Telecommunications Juhan Parts addressed the audience about oil shale and the U.S. energy future.

Mines was invited to join the **National Geothermal Academy** and participated in its summer program at the University of Nevada, Reno, which received a \$1.2 million Department of Energy grant to develop and operate the National Geothermal Institute, a consortium of top geothermal research institutions including the Massachusetts Institute of Technology, Cornell University, Stanford University, the Oregon Institute of Technology and the University of Utah.

BP Oil Spill Prompts Hydrate Research

Almost immediately after the April 20, 2010, rupture at BP's Deepwater Horizon oil rig, scientists and engineers began asking questions about why it happened and how to respond more effectively should it happen again. Of the many research projects launched to answer these questions, there's one moving ahead through the Colorado School of Mines Hydrate Center that could shed light on processes never before observed.

The Center for Hydrate Research received funding through two NSF RAPID grants to produce the Deepwater Oil and Gas Well Blowout Simulator. A laboratory-scale apparatus with visual and electronic monitoring capabilities, the DOGWB simulator will offer improved risk-assessment of hydrate formation in deepwater gas/oil blowout scenarios, enabling engineers to design better containment systems and more effective crisis-response protocols.

"The simulator was designed in direct response to what happened in the Gulf of Mexico," says Amadeu Sum, a co-director of the Center for Hydrate Research. "It's going to provide information that's not currently available to help us understand what happened and how we can prevent it from happening again."

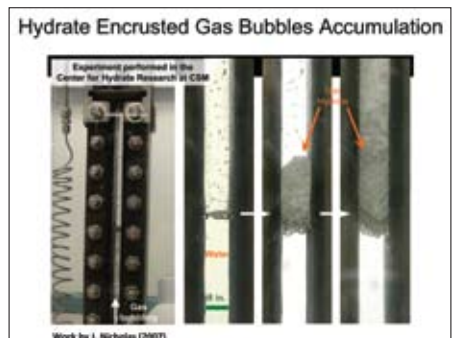
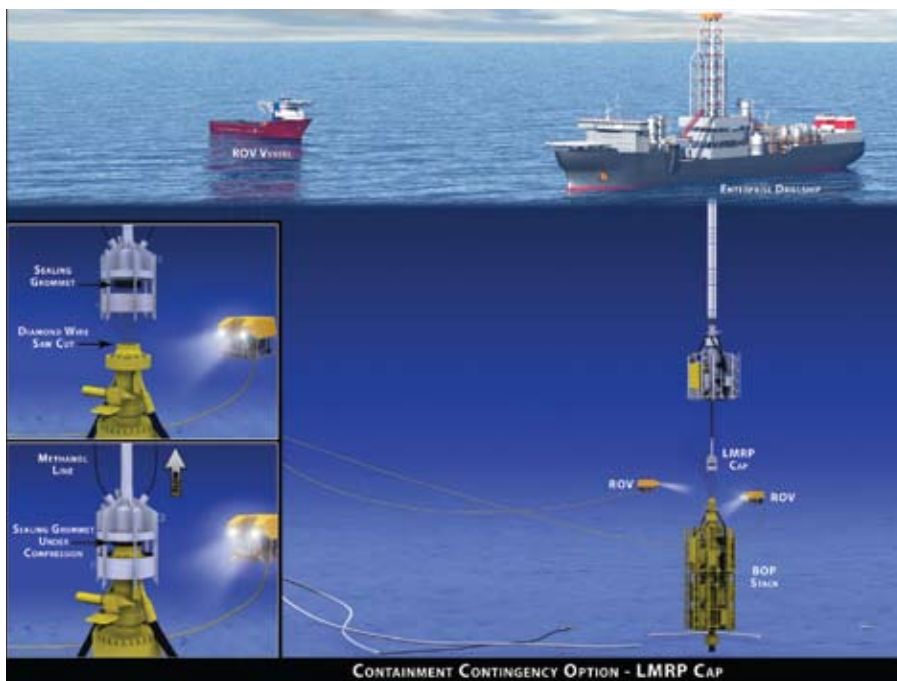
The device will yield new insight about the formation of hydrates—crystalline structures consisting of water and natural gas molecules that readily form under low temperature and high pressure—the conditions found in deepwater blowouts, and elsewhere. In fact, hydrate formation is a menace in many oil and gas operations, where cold, pressurized pipelines are often used to transport both oil and gas.

Hydrate formation foiled BP's initial effort to contain the Deepwater Horizon blowout. "The first containment device BP deployed was a 100-ton dome structure," explains Carolyn Koh, co-director of the Hydrate Center. "But the



Zach Aman '09, Sanjeev Joshi and J. Levine, CSM

Clockwise from Top: A precisely modulated downward current in CSM's DOGWB simulator prototype keeps a gas bubble stationary. By varying temperature, pressure and chemical composition, researchers are able to observe phenomena such as oil/gas dispersion in water and the formation of gas hydrates, such as those encountered in an oil/gas well blowout; a hydrate plug is removed from a pipeline; hydrate encrusted gas bubbles form in a high pressure water column, leading to blockage of the channel; illustrations of containment and response in the Macondo well.



dome trapped a mixture of water, gas and oil—all the ingredients you need for the formation of gas hydrates. Gas hydrate crystals did form, and they caused a blockage in the containment structure, leading to the failure of the dome.”

Offshore operations sometimes keep pipelines clear of hydrates by injecting methanol, which inhibits their formation. A more targeted approach became possible after the Hydrate Center developed a computer-modeling tool, CSMGem, which enables pipeline operators to locate points in a pipeline where temperature and pressure conditions exist that make hydrate formation likely. Injecting inhibitors for those locations can be an economical solution. However, such an approach isn't always effective or economical in deepwater conditions, where hydrates can occur very readily.

“At greater depth, the amount of methanol that's required can be up to 60 percent of the overall flow volume,” Koh says. “That's not viable economically or environmentally, so we need another approach.”

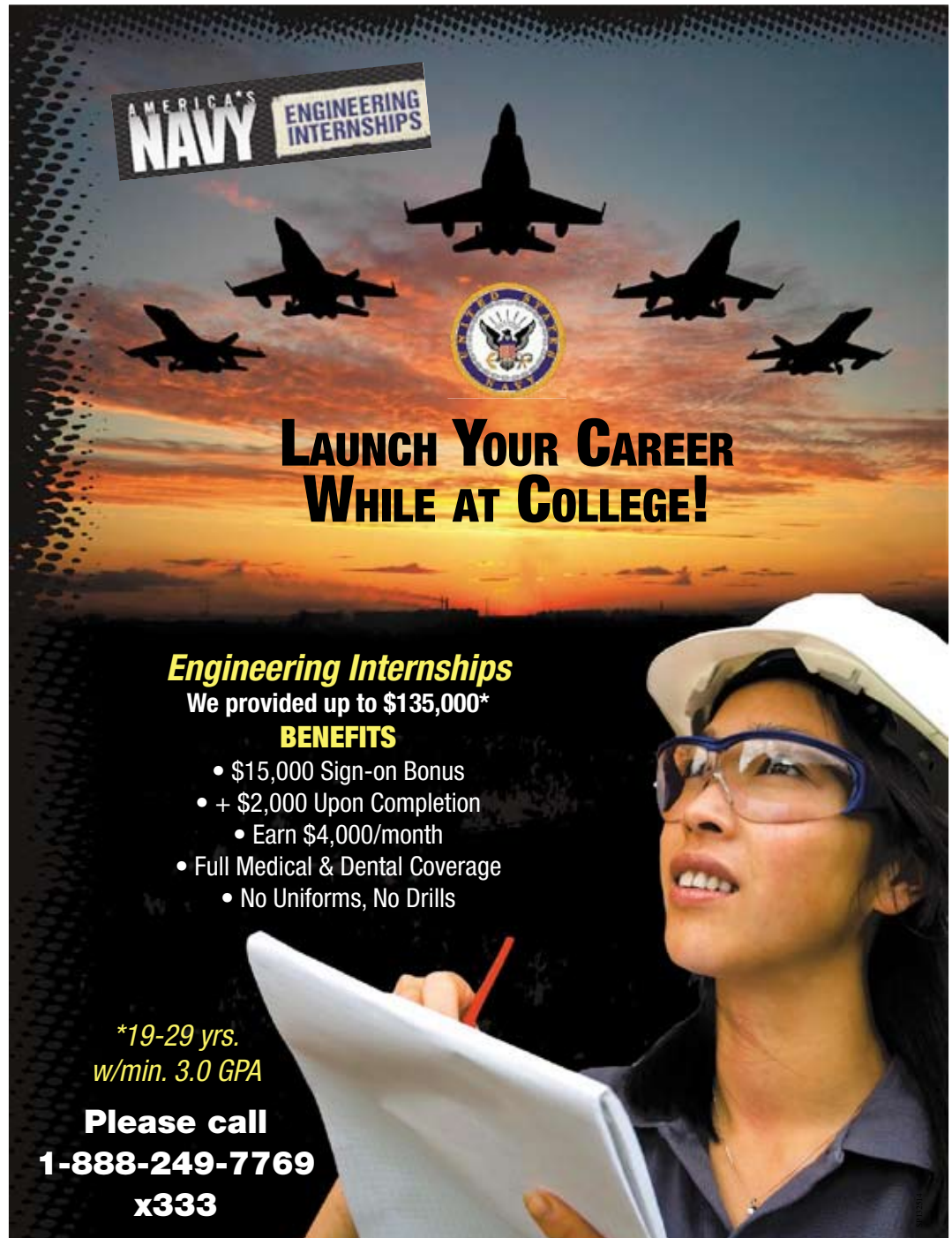
To find one, more research into the basic physics and chemistry of hydrate formation in open deepwater environments is required, which will be facilitated by the DOGWB simulator. It will mix water, gas and oil under high pressure in a vertical tunnel with a downward flow of seawater. By matching the downward flow to the upward buoyancy of the gas bubble or oil droplet, the gas bubble (or oil droplet) will remain stationary, giving researchers the opportunity to closely observe hydrate formation around it and experiment with various interventions.

“We need to examine not only how you prevent hydrates from forming, but also how you manage the ones that do form in a blowout scenario,” Koh explains. “We need to be better equipped to respond.”

In addition to providing valuable information on hydrate formation, DOGWB will also be

used to better understand the impact of hydrates on the dispersion of oil emitted in a deepwater blowout, helping response crews better anticipate the movement of oil in the event of a future spill. It may also yield useful insights into the management of natural hydrate deposits, found in permafrost, the ocean floor and other extreme, low-temperature environments. If all goes according to plan, the DOGWB prototype will be operational by the spring of 2011.

—Larry Borowsky



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Environmental Science and Engineering

Shipments impounded in a West African port, customs officials demanding bribes, visits with tribal kings, nomadic tribal children with college aspirations: This may sound like the stuff of Hollywood, but for environmental science and engineering graduate students Leah Feazel and Andrew Nelson, it outlines a significant portion of their summer.

It started with a chance encounter on a bike path in Boulder with a University of Colorado philosophy professor who Feazel knew from a spin class. When their conversation shifted to Ajume Wingo's home country of Cameroon, Feazel and Nelson became more curious. They had already discussed traveling to Africa during summer 2010, but they weren't looking for a vacation. Wherever it was they decided to go, "we wanted to find a way that we could help," says Feazel. Wingo was describing a place with tremendous needs, so when he extended an invitation for them to visit his family in Cameroon, their question was, "If we went, what could we do to help?"

The child of Quaker parents, Feazel was encouraged to think this way from a young age. "For them, anything you can do to promote the physical or spiritual wellbeing of someone else is what you should do," she says. "It's not something you should do if you have time. It's just what you should do." At Christmas, Feazel was offered a choice between a present or a donation to charity. "It got to be sort of a game," she says. "I'd get a dozen chicks that would get donated to somebody for Christmas. It was just really fun." Living by a similar creed, her grandparents saw a constant stream of people—some down on their luck—pass through their remote ranch on the Western Slope. "It was an anyone-is-welcome sort of a place," she says.

Nelson was brought up with a similar set of values by his parents, who are both teachers. While attending high school for two years in Geneva, Switzerland, he made friends with several Africans and always enjoyed hearing descriptions of their home countries. The more he heard, the more he wanted to go: It sounded exotic and beautiful, but also, while his friends were from relatively wealthy families, he was disturbed by the level of poverty they described.

It was Wingo who had the idea of taking bicycles to Cameroon to sell. Bikes are prized in Cameroon's port city of Douala, where gridlock makes traveling by car difficult. A little research showed computers



were also in high demand—any computer, no matter how old. Over the ensuing weeks, the three began to form a plan: solicit donations for bikes and computers, ship them to Cameroon in a container, sell the contents and use the proceeds to sponsor primary education for orphans and children in Cameroon's rural communities.

As a first step toward realizing the plan, Feazel and Nelson created the non-profit, DOORs Cameroon (Developing Opportunities for Orphans and Residents of Cameroon), and began advertising for donations of bicycles and computers. It was an effective strategy; donations poured in. They also needed cash. While they would pay for all their personal travel expenses out of their own pockets, they needed to cover the cost of shipping the container. If they exceeded that, they could apply it to their education fund. They got a big boost when a local librarian offered to pay a quarter of the shipping fees in return for including 2,500 books in the container.

The first phase of their plan went off without a hitch—90 bicycles, 90 computers, some auxiliary technology, and the books were shipped in April and arrived in Douala, Cameroon's only major port, in early June. However, when Feazel and Nelson arrived in Cameroon shortly thereafter, things began to go awry.

"We'd been warned about the corruption," Feazel says, but neither one was prepared for what came next. The shipping container had been impounded and 33 signatures were required for its release—that meant 33 bribes, which would total several thousand dollars—more than the price of shipping the container from the U.S. Adding insult to injury, they then discovered that the charity that they were working with, which was supposed to be helping to get the container through the port, was also on the take.

Annoyed and frustrated, they left Douala and headed inland to meet Wingo's family. It helped to leave the city, and it wasn't long before their adventure began looking up again. Wingo's family gave them a warm welcome and set them up in comfortable, though basic, accommodation. "We pretty much spent two months learning the culture," says Nelson. They explored the surrounding area, visited farmers, herdsman and a tribal king, and they took trips up into the mountains to see an active volcano. They also had time to reflect on what they were trying to accomplish.

In the end, this had a major impact. "It really changed our mission as a charity," says Feazel. After they learned that sponsoring

primary school students would require working through another corrupt local charity, they were less inclined to pursue that path. At the same time, they met four bright, motivated teenagers who want to attend college, but lack the means to do so. Nelson and Feazel decided they wanted DOORs Cameroon to support them. While it will cost considerably more (\$1000 per student per year, as opposed to about \$15 per year for a primary school child) Nelson says, "these kids want to go to university. It would be like a dream come true."

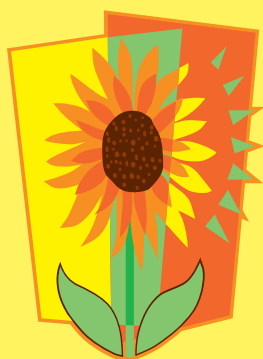
It is also logistically far more manageable—they can wire the funds directly to the students and avoid the rampant corruption they have so far encountered at every turn. The four teenagers they are considering are the children of a nomadic tribal king. Feazel and Nelson are particularly excited about sponsoring his two daughters, since women rarely have the opportunity to go to college in Cameroon.

When Feazel and Nelson left Cameroon in early August, the container had still not been released by the port authorities. When it was, they found that the several computers and hard drives had been stolen, but otherwise the contents were intact. Since then, the remaining computers have been sold by the Cameroonian charity, the books were donated to an English library (apparently doubling its collection), and the bicycles are being sold by Wingo's brother, the most trustworthy of their contacts in Cameroon, where family loyalty is sacrosanct.

Despite some setbacks, Feazel and Nelson are proud and happy with what they've accomplished. DOORs Cameroon has a positive balance, and they're looking forward to pursuing their new mission. "It was a learning experience," says Feazel, who says they plan to return to Cameroon in December 2011 to confirm the recipients of DOORs Cameroon college scholarships and to see what more they can do. Equipped with a much better understanding of Cameroon, and motivated by an affection and empathy for the people and communities they came into contact with, they say they are more confident and eager than ever to continue with their work as a charity.

—Emily Wald

See more photos of Leah Feazel and Andy Nelson's journey to Cameroon at magazine.mines.edu, where we also provide instructions for how to donate and a link to their website—www.doorscameroon.webs.com.



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Investing in Mines

An investment in knowledge always pays the best interest.

—Benjamin Franklin

A Celebration “At the Frontier” Contributors Honored at Mines Century Society Dinner

The spotlight at the annual Mines Century Society Dinner was on the university’s research at the frontier of innovation as well as on guests’ Western boots, hats and rhinestones. Lockridge Arena was transformed into a mountain mining camp setting for the annual donor recognition event held Oct. 9. The evening’s theme, “At the Frontier,” encompassed both the university’s forward-looking initiatives and its mining frontier heritage. President Scoggins recognized members of the Century Society, President’s Council and Heritage Society, and presented young alumni, faculty/staff and outstanding philanthropist awards. Rex Rideout welcomed guests with music from the 19th Century West, while The Ackermans, a bluegrass band featuring brothers and Mines students Aaron and Jeremy Ackerman, kept guests kicking up their heels well into the evening.



Chris Peters/Peters Photography

2010 Philanthropy Awards

John M. McLaughlin '01

The Young Philanthropist Award

Robert D. Knecht '70, MS'75, PhD'79

The Faculty and Staff Philanthropy Award

Harry D. Campbell '42

The Tourmaline Award

Learn more about the 2010 philanthropy award recipients at giving.mines.edu/philanthropyawards.

Mines Century Society New and Rising Members

Individuals whose lifetime giving to the school totals \$100,000 or more are honored as members of the Mines Century Society at Copper, Silver, Gold, Platinum and Diamond levels. The following individuals are new members of the Century Society, or recently moved to a new Century Society level.

Diamond Level \$5,000,000+

Timothy M. and Bernadette Marquez*

Gold Level \$1,000,000 to \$2,999,999

Mahir M. Jalili

John G. Underwood

Stewart R. Wallace

Herbert L. and Doris S. Young**

Silver Level \$500,000 to \$999,999

Gerald W. and Bettina B. Grandey**

Copper Level \$100,000 to \$499,999

William J. and Louise K. Barrett

Richard B. Egen

William W. Fleckenstein

Edward F. and Amy Gallegos

Luanna Goetz

Tim and Mary Haddon

Donald L. and Barbara L. Kammerzell

Mary Jane Pfeil

John E. Ross

Michael R. and Patricia K. Starzer

James and Grace Thoma

Fun-Den and Agnes Wang

Olin and Jackie Whitescarver

George and Beth Wood

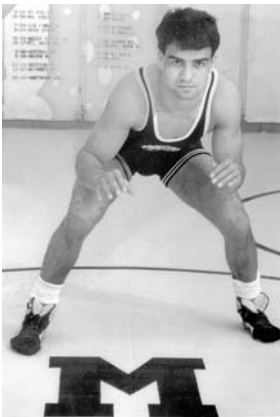
William J. and Nancy L. Yopp

*Previously a Gold MCS member.

**Previously a Copper MCS member.

Learn more about the Mines Century Society at giving.mines.edu/mcs.

Grinder Scholarship Sharpens Competitive Edge for Mines Wrestlers



College wrestling was a lesson in perseverance for Ed Gallegos '92, whose dedication and skill earned him All-American honors and a sixth-place finish at the 1991 NCAA Division II National Wrestling Championships.

"Wrestlers face a lot of injuries that keep them out of competition. But even when you do get on the mat, you find that your stomach is full of nerves or your muscles are nagging you—the conditions are never absolutely perfect," says Gallegos. "But you have to get out there and do it, even when you are tired or you don't feel good."

The determination to press on even when circumstances are less than ideal is a trait Gallegos attributes to his days as a wrestler at Mines—and one that continues to serve him well as owner of Oklahoma-based Territory Resources, an independent oil and gas firm. Through the Grinder Scholarship, which he established last spring with a \$105,000 endowment contribution, Gallegos aims to ensure that future generations of Mines students continue to have opportunities to hone their competitive instincts and learn the value

of commitment. The scholarship provides valuable financial support for student-athletes on Mines' varsity wrestling team.

"Academic courses prepare you to create a solid business plan, but wrestling prepares you better to survive in business when things don't go according to plan," he says. Supporting Mines' wrestling program is Gallegos' way of showing his continued pride in the program and of paying tribute to former Coach Jack Hancock for helping to shape Gallegos' own work ethic and drive. "There are people out there who think that winning doesn't matter, but it absolutely matters. If you're going to compete, you should focus on winning—in wrestling and at work."

Scholarship funds allow Mines to recruit athletes who boost the wrestling team's competitive profile and who excel in the classroom. Last year, the wrestling program was ranked ninth in the NCAA Division II Wrestling Coaches Association's All-Academic Top 15 list.

Former Head Wrestling Coach Dan Lewis, who continues to serve as an assistant coach, says, "Ed Gallegos is one of the nicest, most generous people I know, as well as a very humble and caring individual. The endowment Ed created is deeply appreciated and extremely important to the wrestling program. We're already seeing the impact of his gift and are looking forward to the benefit it will bring to Mines' student-athletes for generations to come."

—Erica Siemers

The Timothy and Bernadette Marquez Foundation makes \$4.2 million pledge payment; Chevron contributes \$760,000; Other recent gifts

Colorado School of Mines recently received 11 large gifts:

Anadarko Petroleum Corporation contributed gifts totaling \$225,000 in support of the Marquez Hall building project and the petroleum engineering and geology and geological engineering departments.

BHP Billiton made a \$100,000 pledge payment toward their \$500,000 commitment to the Marquez Hall building project.

Chevron contributed \$760,000 to the Chevron Center of Research Excellence at Mines.

The CMG Foundation contributed \$100,000 in continued support for the CMG/CSM Reservoir Modeling Research Chair at Mines.

Devon Energy Corporation made a \$100,000 payment toward their \$500,000 pledge to the Marquez Hall building project.

EnCana Oil & Gas (USA) Inc. contributed \$400,000 toward their \$2 million commitment to the Marquez Hall building project.

ExxonMobil contributed gifts totaling \$149,000 toward the Oil Shale Symposium, the Colorado Energy Research Institute (CERI) and academic departments, as well as toward improving elementary mathematics and science instruction in the Meeker School District.

Jerry '68 and Tina Grandey contributed \$214,875, which will be used to support The Mines Fund and to establish both an endowment and a current-use fund in support of the Nuclear Science and Engineering Program.

Shell Oil Company contributed \$100,000 in support of several academic departments and programs.

The Timothy and Bernadette Marquez Foundation made a \$4,200,572 payment on its \$10 million pledge for Marquez Hall.

Bequest distributions totaling \$468,407 were received from the estate of **Stewart R. Wallace**, whose total bequest to Mines, in excess of \$1.8 million, will support geology students, the Department of Geology and Geological Engineering and The Mines Fund.

Other recent gifts of \$25,000 and more from individuals, corporations and foundations:

ArcelorMittal contributed \$50,000 to support the Metallurgical and Materials Engineering Department, the Minority Engineering Program and the campus chapter of the Society of Women Engineers.

William M. Aubrey '43 contributed \$25,000 to establish a charitable gift annuity, which will ultimately provide support for The Mines Fund.

The Bill Barrett Corporation made a \$41,667 payment toward their \$125,000 commitment to the Marquez Hall building project.

Jerome T. '64 and Rebecca Broussard contributed \$25,000 in continuing support for the Broussard Family Engineering and Technology Management Scholarship Fund.

Chesapeake Energy Corporation contributed \$25,000 in support of undergraduate scholarships.

Halliburton made a \$30,000 contribution to the Minority Engineering Program and undergraduate scholarships.

Marathon Oil Corporation contributed \$55,000 for undergraduate scholarships and academic departments.

Newmont Mining Corporation contributed \$75,000 toward the Center for Innovation in Earth Resources Science and Engineering (CIERSE).

Peabody Holding Company contributed \$30,000 in support of the Department of Mining Engineering.

Geraldine Piper contributed \$25,000 to the Robert G. and Geraldine D. Piper Endowed Scholarship Fund, in memory of her husband, **Bob Piper '49**.

Charles A. '61 and Louanne Shultz contributed \$49,230 in continued support for the Shultz Athletic Scholarship Endowment Fund.

Thomas C. '38 and Mary Snedeker contributed \$50,000 to a charitable remainder trust that provides income to them now and will support Mines in the future.

Ward Petroleum Corporation made a \$25,000 payment on their \$100,000 pledge to the Marquez Hall building project.

Men's Soccer Ranked #1 in Nation



Joel M. Bach

The men's soccer team achieved a #1 national ranking this fall, marking the first time that a Mines team has been ranked at the top of a national Top-25 poll.

Head Coach Frank Kohlenstein's squad began the year at #18. In their 2010 season opener, the Orediggers recorded a 1-0 shutout victory over defending national champion Fort Lewis College. The Orediggers proceeded to amass a 13-0-1 record during their first eight matches and climbed to the top of the National Soccer Coaches Association of America's weekly Top-25 poll in late September. In mid-October, Mines learned that it would host the 2010 RMAC Men's Soccer Tournament.

Last season, Mines went 15-3-4 overall and qualified for the NCAA Tournament for the second time in program history. Kohlenstein, who was selected as the NSCAA/Mondo Central Region Coach of the Year, guided the team to a #18 ranking in the final 2009 NSCAA Top-25 poll. Kohlenstein, now in his 13th season at Mines, was also selected as the RMAC Men's Soccer Coach of the Year for the fourth time in 2009.



Courtesy of CSM Athletics

Junior Chike Sullivan, a native of Trinidad and Tobago, finished 5th in the RMAC in 2009 with 11 goals.



Courtesy of CSM Athletics

Men's Cross Country #2

The men's cross country team achieved a #2 national ranking in the U.S. Track & Field and Cross Country Coaches Association Top-25 poll in early October. The Orediggers were ranked third in the pre-season poll.

The Mines men placed third in the nation in 2009, marking the highest-ever finish for a Mines cross country team (men or women) at the NCAA championships.

In other cross country news, Ben Zywicki and Marie Patton earned RMAC Runner of the Week recognition during the 2010 season. Zywicki is a six-time All-American for the cross country and track & field programs, while Patton is a three-time All-American. The Mines men and women both earned All-Academic Team honors from the U.S. Track & Field and Cross Country Coaches Association for 2010.



Marie Patton

Courtesy of CSM Athletics

Mines Ranked #6 in NCSA's 2010 Collegiate Power Rankings

Mines Athletics was ranked #6 in the National Collegiate Scouting Association's 2010 NCAA Division II Collegiate Power Rankings, which assesses the academic and athletic standards of most college athletic programs across the country.

Mines was the only Rocky Mountain Athletic Conference institution listed in the top 75 NCSA rankings for 2010. The NCSA's Collegiate Power Rankings are calculated for each college and university by averaging student-athlete graduation rates, academic rankings provided by *U.S. News & World Report* and the Learfield Sports Directors' Cup rankings. Mines earned its highest-ever finish in the 2009-10 Learfield Sports Directors' Cup standings at #15.

Oredigger News & Notes...

• Kristie Hawkins has been named interim head softball coach. Hawkins served as an assistant coach for the Orediggers during the 2009 and 2010 seasons.



Courtesy of CSM Athletics



Joel M. Bach



Courtesy of CSM Athletics

• Hannah Davey-Briggs '06 (cross country, track & field), Chad Frieauf '05 (football) and the 2004 football team were inducted

into the Athletics Hall of Fame in October. Davey-Briggs was the 2004 national champion in the 3,000-meter steeplechase and Frieauf won the Harlon Hill Trophy in 2004, which goes to the best player in NCAA Division II football. The 2004 football team achieved a 12-1 record, winning the RMAC Championship and becoming the first-ever Mines football team to qualify for NCAA playoffs.



Joel M. Bach

• Mines quarterback Clay Garcia was named RMAC Offensive Player of the Week on two occasions in September. Garcia, who has qualified for the dean's list during every semester of his collegiate career, is a Boettcher Scholar.



Courtesy of CSM Athletics

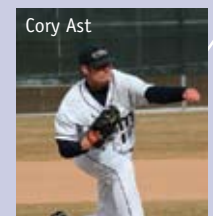
• Kevin Fickes was hired as the new women's soccer coach in July. Fickes served as an assistant to men's soccer coach Frank Kohlenstein from 1998-2006. The Oredigger women concluded the 2009 season ranked #7 in the NCAA Division II.

• Volleyball's Elizabeth Serra-Hsu, a pre-season All-RMAC selection in 2010, was named to the Oredigger Volleyball Classic, and Angelo State Invitational all-tournament teams in September. Jackie Stabell also earned recognition on the Angelo State Invitational all-tournament team. The Orediggers landed back-to-back-to-back RMAC Players of the Week (Holly Hutchison, Hannah Margheim and Amanda Massey) midway through the 2010 season.

• Former Mines baseball player Marshall Schuler '10 was drafted by the Philadelphia Phillies in June of 2010. In addition, the Orediggers' Cory Ast signed a free-agent contract with the Baltimore Orioles last summer.



Marshall Schuler



Cory Ast

Courtesy of CSM Athletics



Angel Forsling

Courtesy of CSM Athletics

• The men's and women's swimming & diving teams both earned Scholar All-American recognition for the 2009-10 school year. Individually, Jesse Dennis, Angel Forsling and Sarah Moore garnered Scholar All-American accolades while Brian Coates and Aaron Miller were selected as Honorable Mention Scholar All-Americans.

For complete schedules, rosters, results and statistics, please visit the Colorado School of Mines Athletics website: www.csmorediggers.com.

“The Magazine is to be a monthly paper devoted to technical articles, an abstract of new books and current articles, school affairs, athletics and alumni notes ... It is expected that the Magazine will be the means of bringing the members of the Association closer together.”

*Colorado School of Mines Magazine Editor, Jay Lonergan 1905
October 1910, inaugural issue*

100 Years



Celebrating a Century of Mines Magazine

Part I: 1910 – 1960

By Bill Eckley
and
Nick Sutcliffe

An independent publication of the Colorado School of Mines Alumni Association, *The Colorado School of Mines Magazine* cost 25 cents per copy or \$1.50 per year in 1910—a price that held steady for more than 20 years. It measured 9 3/4 x 6 inches and was illustrated on the cover with a rose entwined with an oak leaf. There was only one photograph in the 18-page first edition: a stern image of the football coaching staff, athletic director and team captain.

For the ensuing 60 years, *The Colorado School of Mines Magazine* served the dual purposes of keeping alumni in touch with each other and the school, while also disseminating research and practical information among a highly specialized group of geotechnical professionals. Part industry journal, part community journal, the publication drew strength from Mines' focused mission. While most college alumni magazines have historically aimed to engage alumni with news from campus, sports, class notes and a handful of general-interest feature articles, *Colorado School of Mines Magazine* was able to do this and more, delivering practical and often highly technical articles that could have an impact on its readers' professional success. Starting in the '30s, special issues began focusing on specific disciplines such as petroleum, mining and metallurgy. While issues typically numbered about 48 pages, the annual petroleum editions of the '50s and '60s frequently exceeded 150 pages, densely packed with long and detailed papers.

Launched as strictly a publication of the Colorado School of Mines Alumni Association, the magazine's relationship to the school has gone through a number of changes over the years. Published with frequent messages from the school president and run from offices on campus, *The Colorado School of Mines Magazine* started out with close ties to the school. However, in 1920, a conflict between the administration and the magazine resulted in temporary eviction from campus and the resignation of then editor C. Erb Wuensch '14. In 1928, deteriorating relations precipitated a move to Denver, and it would be 30 years before the alumni association and the magazine (renamed *The Mines Magazine* in 1932) would come back to Golden. The 1958 return to campus marked a turning point in the relationship, which while turbulent at times, remained fundamentally cooperative through the present time. In fact in 2000, with the signing of a memorandum of understanding between the Colorado School of Mines Alumni Association and the school, *Mines Magazine*, as it had been titled since 1976, became a jointly sponsored publication under the still more abbreviated title, *Mines*.

To mark the magazine's 100th anniversary, we offer an abbreviated history in two parts. With about 40,000 pages published, our story of *Mines* magazine will be gleaned from samplings taken at 10-year intervals: 1910, 1920, 1930 and so on. Part I covers the years 1910 – 1960, Part II, slated for the spring issue, will cover the remaining years. To augment this retrospective, and to enable readers to take their own journey through the last century of *Mines* magazine, more than 100 issues have been scanned and made available on the newly updated *Mines* magazine website (magazine.mines.edu) as searchable PDF documents.



GETTING OFF THE GROUND: 1910-1930

The opening pages of Volume 1, Number 1 include a detailed technical discussion about the workings of the new Ore Dressing and Metallurgical Experimental Plant on campus. The alumni pages that follow contain news of campus and alumni. The football coach, Ted Stuart, writes about recent revisions to the rules of football: "To a player of the 'old guard' the game will now present many queer features, combining some elements of basketball, soccer and English rugby, to the exclusion of nearly every semblance of the game he knew." College Notes records that freshmen and sophomores recently met on the lawn outside Stratton Hall for the Barbecue—an annual tradition that reads more like a pitched battle between the years and includes no mention of a meal. In other news, 10 Chinese students are reported to have registered for classes, eliciting this insightful commentary: "The Chinese Empire has taken a step along progressive lines, which, if followed, will cause her to be recognized as one of the great powers of the future."

Club Notes describes a meeting of the Integral Club in the gymnasium at which Coach Stuart exhorted all those who were physically able to try out for the football team. The reporter writes, "He stated emphatically that he did not want 'quitters,' but wanted men with the 'Mines Spirit.'" The first dance of the season had taken place on September 24, 1910, in Guggenheim Hall—music furnished by the C.S.M. orchestra. Club Notes also points out that the beginning of the school year saw 130 members of the Christian Association and about 100 men were expected to attend Bible Study that year.



The second issue opens on a sober note with a meticulous account by W. W. Evans '08 of the October 8, 1910, Starkville Mine explosion in which 56 miners died. Located near Trinidad, Colorado, the mine was one of the leading producers of coking bituminous coal. With the awareness of one who knows that careful documentation might help prevent future accidents, or inform rescue attempts, Evans describes every step of the rescue, including such technical details as getting fresh air into the mine using a fan "driven by a 20-horsepower, direct-current motor, revolving at a speed of 300 revolutions per minute ... able to move 50,000 cubic feet of air per minute." He

also conveys the human tragedy: how the bodies were brought out and carefully wrapped in canvas and sprinkled with embalming fluid before the foreign laborers would approach the remains of their co-workers. It is a sad irony that Evans died exactly one month after the Starkville tragedy in an explosion at Delagua, Colorado on November 8, 1910, while involved in another rescue operation. He was 24 years old.

Yefah Chen '14 submitted an interesting essay found on page 4 of Volume 1, Number 5 in which he predicts that human conflict, broadly defined, will culminate in a struggle between China and the U.S.: "By reason of the population of the two races, the intricacy of the different governments concerned in and its far reaching consequences, this will be the greatest and the last disturbance among the family of nations and will foreshadow [he likely means "overshadow"] all others of the past history."

It's not the only time that, flipping through early editions of the

THE MINES MEN

magazine, one comes across subjects that seem relevant to modern times. A purely technical paper in the September 1920 issue titled "Investigation of the Fundamentals of Oil-Shale Retorting" elicits an enthusiastic response from a reader in the following December issue, whose endorsement of the potential of oil shale relies on the same arguments used today.

One thing that has changed since the '20s is the relationship between the school and the alumni association. Editions from 1920 describe how Mines came under investigation by the American Association of University Professors for various internal academic problems, which resulted in the school being put on a censure list. Responding to this embarrassing turn of events, C. Erb Wuensch '14, the firebrand editor of the magazine at the time, criticized the school's board of trustees and administration, going so far as to propose that all public Colorado universities be supervised by a single board of regents.

Indignant, the board of trustees retaliated, advising Wuensch that the school would withhold financial support and facilities for the magazine "until such time as the Magazine shall loyally support the school and fulfill its obligations to the institution and to its alumni." Locks were changed at the campus magazine office and Wuensch was forced to move to facilities in Denver. A short while later, admitting that he had violated his own editorial policy, he submitted his resignation. However, it was no coincidence that on March 21, 1921, the school launched its own publication: *The Oredigger*.

As Colorado School of Mines grew, so did the magazine. By 1930, the 875-member-strong alumni association was publishing a 48-page magazine that measured a more substantial 9 x 12 inches and featured many more photographs. Perhaps in light of the Depression, the cost remained level.

That year the magazine reported revenue of \$8,188 in subscriptions and advertisements, and expenses of \$7,724. Advertising may have been the largest source of revenue; almost a third of the January 1930 issue is taken up with ads, with full pages devoted to companies such as General Electric, Ingersol-Rand and The Colorado Fuel and Iron Company.

With the larger format, there was plenty of room left for news and technical content. The February, 1930, issue includes a long and detailed paper titled, "Geophysical Investigation at Caribou, Colorado—Relationship of Topography, Geology, and Magnetic Disturbance." In the news section, several pages are devoted to accounts of the Jan. 23 Engineers' Day, including the speech by Henry

Three Co-Eds AT "MINES"

By FREDERICK C. STERNHAUER, '19
Denver, Colo.

"Mines" is the only one that has been considered a man's magazine. No thought had ever been given to co-edition. Why should there be, for no woman would ever have the industry to read upon a study set. Strange, indeed, because women and men are both interested in the same things. An hour's conversation with a woman geologist will convince you of this. As a matter of fact, the geologist is a woman. She is a woman of science, and she is a woman of letters. She is a woman of the world, and she is a woman of the future. She is a woman of the present, and she is a woman of the past. She is a woman of the earth, and she is a woman of the sky. She is a woman of the sea, and she is a woman of the land. She is a woman of the air, and she is a woman of the water. She is a woman of the fire, and she is a woman of the ice. She is a woman of the sun, and she is a woman of the moon. She is a woman of the stars, and she is a woman of the planets. She is a woman of the universe, and she is a woman of the earth.



GEOPHYSICS GROWS AT "MINES"

By JOHN C. HOLLISTER, '33
Professor of Geophysics

Twenty-five years ago the petroleum industry was discovering about 700 million barrels of new oil each year. In the five '40's the annual discovery rate had increased to more than 3 times this figure despite the fact that the obvious oil structures had long since been discovered and tested. What is responsible for this increase? Scientific exploration—largely geophysics. Geophysics Defined Geophysics might be defined as that



Geophysics Wing, Barlow Hall.

geophysics. As knowledge of its potential benefits spreads and as its considered application produces successful results, so will the use of engineering geophysics increase. Success Starts With Petroleum Industry

It is almost entirely because of this and continued success in tracing of petro-geo-physical structures that geophysical exploration for oil has reached a reasonable degree of development and is regarded as an integral activity in any oil development program. Mining applications, on the contrary, have reached no such degree of development largely because the complexity of the geology surrounding ore deposits and partly because of the relatively little development money spent by the mining industry compared with its petroleum counterpart.

lates through use and success, methods and applications of applied geophysics. Knowledge of Geology Essential Since knowledge of the earth is geology, then the problems with which geophysicists is concerned are geologic.



Geophysics Laboratory, 1932.

The geophysicist must therefore have such a broad acquaintance with geol-



COLORADO SCHOOL OF MINES NEW GEOLOGICAL MUSEUM

By J. HARLAN JOHNSON, '23
Associate Professor of Geology and
"Curator of the Museum"
Colorado School of Mines

ing and mining with equipment was \$45,000. The Museum Wing was not started until the school left the site of Jerome, 1910, while the Geology Department did not open its doors until 1911.

McAllister, a prominent Denver lawyer, who was welcomed to campus by President Melville F. Coolbaugh. The reporter describes how McAllister's humorous accounts of "mining litigation in the early '90's provoked much amusement and applause from the students and engineers who attended the program."

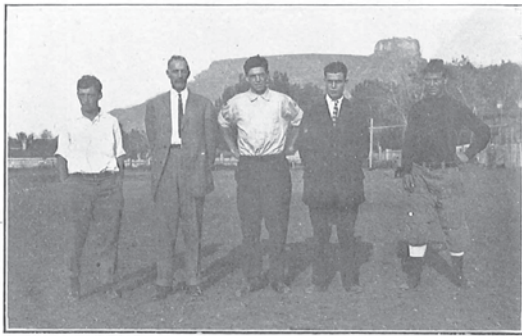
RIDING HIGH: 1940-1960

The year before the magazine celebrated its 30th year of publication, Frank C. Bowman '01 began his 19-year tenure as editor and publication director—the longest service of any editor of the magazine to date. In April 1940, he writes that 30 years of service may not be long compared with the life of many publications, but it was "long enough to show whether your existence is justified by the service rendered." He goes on to dedicate the 30th anniversary issue to the alumni association, writing, "It is only through the hearty cooperation of our many loyal friends that this number has been made possible. To these we extend our sincere appreciation for the support and courage they have supplied."

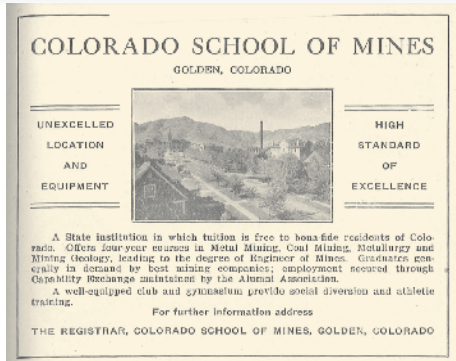
Nineteen years later, having seen the magazine through some extremely successful and busy years for which he was awarded a Distinguished Achievement Medal by the school—the approximately 80-year-old Bowman articulates very similar thoughts in his last issue as editor: "Much of the success of The Magazine can be credited to the fine cooperation I have received from the Staff and from my many friends in the editorial, business, and professional fields, as well as the many MINES MEN throughout the world. It is with the deepest appreciation that I extend my heartiest thanks to each of you."

World War II had a profound impact on Colorado School of Mines. The school's collective contribution to the war effort was substantial, particularly in engineering expertise, and many alumni and others associated with the school made enormous individual sacrifices, including over 100 who lost their lives. In light of this, it's interesting to note that mention of the war in Europe is conspicuously

The COLORADO SCHOOL OF MINES MAGAZINE



From left to right: E. G. Stuart, Assistant Coach; Captain W. C. Bryan, Athletic Director; Tol Stuart, Coach; E. J. Dittus, Manager; Wm. Douglas, Captain.



GENERAL ELECTRIC

- “On the Use of Geophysical Tools” by L. L. Nettleton
- “Summary of the Gas and Oil Possibilities of Utah” by Dorsey Hagaer and Mendell M. Bell
- “Recent Oil and Gas Developments in Alberta, Canada” by Theo A. Link
- “The Developments of Directional Drilling” by J. B. Murdoch, Jr.
- “Metallurgy in Petroleum Refining” by Donald A. Craig, '48
- “Geophysics Grows at Mines” by John C. Hollister '33

To compile this impressive issue, Bowman was supported by an assistant editor, two staff members responsible for production and circulation, 15 associate editors and 24 section editors.

The November 1950 issue includes a full-page obituary for President Emeritus Melville F. Coolbaugh, who led the school from 1925 until 1946.

absent from most of the issues of 1940. Reflecting the isolationist mood of the nation during this time, the first substantial article on the subject doesn't appear until the October issue, which includes the article “Geology and Strategy in the Present War,” by Douglas Johnson, a geology professor at Columbia University. Interestingly, the apparent silence was broken in October with one of the longest articles published in the magazine all year long, and the November issue features a tank on the cover and includes an article titled “Petroleum for War,” by John N. Shuffler.

The magazine tackles another subject in 1940 that had been rarely addressed: women at Mines. In the April issue, Frederick C. Steinhauer '99 traces the history of the school's first three women to earn degrees from the school. While Mines was never legally an all-male institution, by 1940 only a handful of women had ever attended, and even fewer graduated. According to Steinhauer, Florence Caldwell '98 attended Ohio Wesleyan prior to coming to Mines and completing the Civil Engineering degree. She was followed by Grace McDermet '03, who earned the more difficult Engineer of Mines degree; however, she was unable to find a job in the mining industry after her family's mine was sold, so she pursued a successful career with the National Bureau of Standards. The third woman was Ninetta Davis '20, whose degree was also in mining engineering. Following her graduation, Davis worked for the Midwest Refining Company in Wyoming, the Union Oil Company of California, and the Geological Survey. The subject of women at Mines received national attention 12 years later when freshman Nancy Easley, the only female student on campus at the time, appeared on the cover of *Life* magazine with 900 male students in front of Guggenheim Hall.

Among the 12 magazines published during 1950, the October issue stands out—by a mile. While other issues from the year are all around 48 pages, the October issue clocks in at 146. It was the “Fifteenth Annual Petroleum Number,” and along with regular advertisers, the issue includes a host of companies targeting the booming petroleum industry. Most impressive of all, over 100 pages are devoted to 22 technical articles, which include titles such as


The memorial includes details of his childhood, his distinguished academic career, his service during World War I in the chemical warfare division, and his 26-year term as president of the school—the longest term served by any Mines president to date.

The October 1960 publication was the official 50th Anniversary Issue of *Mines* magazine. The cover is gold and appears to depict a copy of the first issue of the magazine, but it is inaccurate. An original first edition may not have been available to the editors, because the October 1960 cover features an October 1910 cover with the school's spherical triangles on the cover—a design that was adopted shortly after launching the magazine, but was not used on the first edition. Thankfully both Harvard and the University of California at Berkeley have first editions in their library that were scanned as part of the Google Books program and can now be viewed online.

This minor detail aside, it's a great issue. To alert readers of the approaching anniversary, a gold cover had been used for each monthly issue since April, but the October issue takes the theme a step further by including a wide variety of articles relating to gold, including “Gold Forms in Ores” by Arthur Weinig '08, “The Role of Gold in International Liquidity” by Oscar Altman, an article about gold mining in the Cripple Creek valley by Max Bowen '24, and a historical review of gold mining in Colorado by Arthur Mayham.

Another article found in the anniversary issue, “*The Mines Magazine—Reminiscing*,” covers the same period we've attempted to span in this article. Written in a very different style, and including a long passage quoted directly from the 25-year retrospective printed in 1935, it would serve as an interesting follow-up to this article. The conclusion used in the 1960 article also provides an appropriate stopping-off point for this article:

The MINES Magazine has recorded the activities of these men for a half century, and we look forward to the next half century in which The MINES Magazine will continue to play an important part in recording the events of an astounding era.

Part II of this *Mines* magazine retrospective will be published in the spring 2011 issue. In the meantime, visit the newly-designed magazine website at magazine.mines.edu to view complete searchable electronic copies of more than 110 issues from throughout the century, including all the articles referenced above. 

An aerial photograph of the Hoover Dam and a new bridge under construction in a canyon. The Hoover Dam is a large concrete structure in the background, with a reservoir behind it. The new bridge is a long, curved concrete structure with multiple arches, spanning across the canyon. The surrounding landscape is rugged and rocky, with some vegetation. The sky is clear and blue.

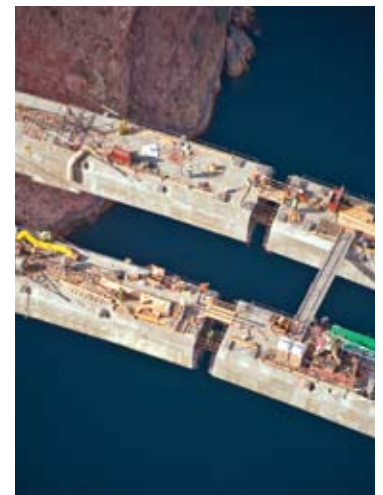
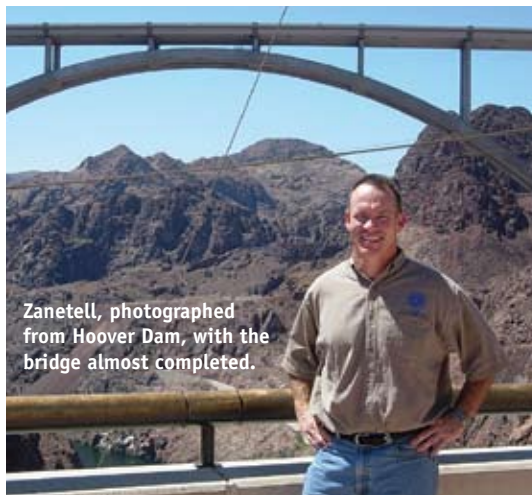
CONSTRUCTING a Landmark

Dave Zanetell '87
leads the construction
and design of a
historic bridge
in the shadow of
Hoover Dam

In five seasons as a middle linebacker for the Colorado School of Mines football team, Dave Zanetell learned a lot about teamwork. That education turned out to be every bit as useful as his Mines engineering degree—maybe even more so—when it came to building the Hoover Dam Bypass Bridge.

Officially opened in October, it's the longest concrete-arch bridge in North America. The towering 300-foot precast/post-tensioned concrete columns supporting the roadway at either side of the arch are the tallest in the world, it's the second-tallest bridge in North America and it's one of the most technically challenging bridges ever constructed.

The director of engineering for the Central Federal Lands Highway Division (a unit of the Federal Highway Administration that encompasses all but five states west of the Mississippi), Zanetell personally led the Bypass Bridge project management team since his appointment in 2001.



Zanetell had no shortage of talented people and firms to pick from—the opportunity to build an iconic and technically challenging structure in the shadow of one of history's greatest engineering achievements doesn't come along very often. "It was one of the biggest jobs you can imagine; one that had the world's attention. The best people in every discipline wanted to be involved, and given the job we had before us, it was a good thing," he says. But, he adds, great people come with strong opinions.

Zanetell had to knit two state governments, four federal agencies, five general contractors, and dozens of consultants into an effective unit. It might easily have devolved into a chaotic tangle of turf wars, conflicting agendas, and clashing egos, but pulling from his old football playbook, Zanetell united these disparate players into a formidable team. "It took work to mold all of that talent into a cohesive group with a singular vision," says Zanetell, who celebrated the completion of the \$240-million span, on budget, this fall after almost six years of construction.

Strung nearly 1,000 feet above the Colorado River, the 1,900-

foot arch-bridge solves problems that stymied engineers for more than three decades. Some of these were difficulties intrinsic to the physical site—high winds, challenging terrain, steep walls, and the canyon's sheer depth and breadth—and some concerned the aesthetics. A steel-truss arch would have been the most straightforward solution, but for the structure to blend with the Hoover Dam, the new bridge would also have to be concrete, and it was agreed that a sweeping arch would best complement the signature concave form of Hoover Dam.

While none of the engineers questioned whether a concrete-arch bridge would perform well once constructed, they all recognized that it made a difficult job much harder. Concrete is heavier than steel, and its structural integrity can be compromised if allowed to set up too fast—a big concern in the hot, dry conditions of the Southwest. For these reasons, several previous plans to build a concrete bridge next to the dam had died during evaluation; as recently as the early nineties, a study declared a concrete bridge in this location to be marginally viable, at best.

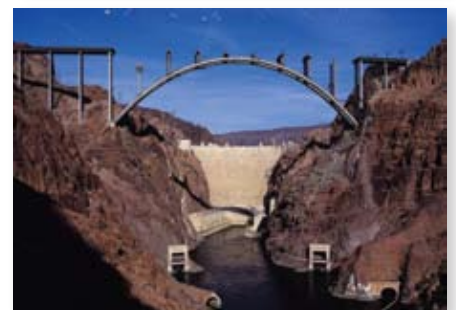
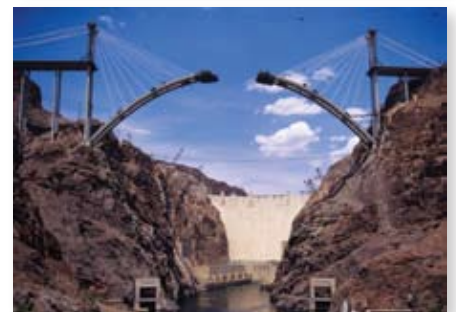
“Almost every one of my trusted mentors and advisors told me not to take this job,” Zanetell laughs. “They said the engineering problems couldn’t be solved, the funds would never come, the agencies would never work together, the project would stall out and it would ruin my career. I saw it the opposite way—great things aren’t supposed to come easy.”

His friend and former football coach Marv Kay ‘63 isn’t surprised to hear this from the former linebacker. “Dave was always at his best when the odds were in question,” says Kay, who recently attended the bridge opening as a personal guest of Zanetell’s. “The success he had was due to a great deal of effort and plain old hard work.”

Craig Schurig ‘87 who played alongside Zanetell for Mines from 1982 until 1986 echoes Kay’s remarks. “Dave was an outstanding leader,” Schurig says. “Sometimes we were on the wrong side of the score, but Dave always played like we were about to win and demanded that everyone else do the same. He’s a winner, and he motivates those who work with him to be winners,” adds Schurig, who is now head football coach at Washburn University in Topeka, Kansas.

After receiving the assignment in 2001, his first act was to reorganize the team of primary stakeholders: the Federal Highway Administration; the U.S. Bureau of Reclamation, which operates Hoover Dam; the National Park Service, which administers the recreational lands directly behind the dam as well as Lake Mead; the Western Area Power Administration; and the transportation departments of the two states that the new bridge would connect—Nevada and Arizona.

“One of the first things we did when we brought the multiagency team together was to draw up a game plan that defined roles and responsibilities. That was not easy work. We were dealing with the most





senior leaders of those organizations, and everybody wasn't necessarily in the role they wanted to play," says Zanetell. "But it was the role and leadership structure the project needed. We got everybody's signature on an operating agreement. Everybody bought in. And that was the beginning of creating a team with a unified vision."

It also established the principle of team accountability. "If there's one thing I learned playing football, it is accountability. You have to be accountable to your teammates and your assignment—every player, every position. A coach's decisions may often be based on the input of others, but it is not subject to debate," says Zanetell. "There comes a point when the team has to believe the coach will make the right call."

After seeing posturing and bias pull too many projects off course, Zanetell attributes the successful management of the Bypass Bridge project to this centralized approach. "It was amazing to see how this brought forth the best in people," he says. "When we brought new contractors and staff on board, we didn't just hand them the ball. We brought them into our team."

The results speak for themselves. Since assembling pre-fabricated sections wasn't feasible due to their weight, the entire arch was cast in place, one 25-foot section at a time.

With each section formed using concrete pumped from the canyon rim, the ribs of the arch grew closer—also heavier. Until the 530-foot ribs came together, they had to be supported by elaborate arrays of steel cables strung from temporary towers constructed on either side of the canyon. "We effectively built a temporary cable-stay bridge to support the

ribs during construction," explains Zanetell.

Given the extreme temperatures experienced at the site, thermal control of the concrete curing process sometimes required elaborate measures, including cooling materials before mixing, pouring at night and, during the hottest months, even using liquid nitrogen to cool the mixed concrete before it was placed.

In August 2009, the last sections of the arch were poured, and alignment was found to be only three-eighths of an inch off center—well within the one-inch tolerance. For centuries, the completion of an arch bridge—marked by placement of the final keystones or, in the case of modern concrete bridges, a closure pour—has been a time for celebration. In the case of the Bypass Bridge, the closure-pour put the most critical and dangerous phase of the project behind them, and it was celebrated by just about everyone involved in its construction—but not Zanetell.

"I dearly wanted to be there," he admits, "but it was a time for the crews to celebrate. For the management team, we had a year of difficult and dangerous work left. I had to make it clear to everyone that we couldn't afford to lose focus." David Goodyear, the design engineer for the project, who according to Zanetell is one of the world's best long-span engineers, remarked that it was the most intensely managed project he could recall.

Now that the Bypass Bridge is open, it offers visitors a more spectacular view of Hoover Dam than ever before—so long as they take the time to walk out on the bridge. For safety reasons, the view is blocked for those driving over the bridge. And for visitors wanting to retrace the old path of Route 19, one-way traffic across the top of the dam is still permitted from the Nevada side.

As any football player can tell you, winning and losing can be contagious. Zanetell, whose 2007 promotion expanded his responsibilities to encompass administration of approximately 50 projects annually across 14 western states, hopes his team's work on the Bypass Bridge can serve as a national model.

"The professionals who have worked on this job have been amazing in their commitment to it and their embrace of a team concept. That's a hard thing to do, and it's really special when you find a group of people who come together to make it happen. In civil engineering, Hoover Dam is your gold standard. But the leaders who were responsible for building it didn't quit on that success. They built on that confidence and energy to put up Shasta Dam and other major structures. They used that momentum for the benefit of our country and our industry," says Zanetell.

"That's my goal—to take this success and create a sense of confidence and a sense of will so that there can be support for even greater endeavors." **M**



Leadership Perspective



Clockwise from top left: Rendering of Harvard RoboBees Project's robotic bee (courtesy: Harvard University); mapping of Oceans Observatory Initiative sensors, which gather data on ocean currents (courtesy: University of Washington); Dr. Arden Bement (courtesy: Sam Kittner/kittner.com); as part of NSF's CAVE project, scientists explore molecular structures inside a 3D visualization facility (courtesy: Wolfgang Bluhm); NSF's Alaska Region Research Vessel (courtesy: Glosthen Associates); ALMA antenna on its way up to 5000 m in Chile (courtesy: ALMA)

Q & A with NSF director, Arden Bement '54

Interview by Nick Sutcliffe

Arden Bement '54 stepped down as director of the National Science Foundation at the end of May 2010. Appointed by President George W. Bush in 2004, he was the 12th director of the 60-year-old agency and only the second engineer to fill the post.

Shortly before his NSF departure, Bement welcomed me into his spacious office atop the agency's Arlington, Virginia, headquarters, where our conversation covered both the personal and the professional: he spoke on topics of national concern that he's addressed during his term at the NSF; he spoke about his own career and identified some of the strategies that have contributed to his success; and he described some of the global changes he sees on the horizon for us all.

Prior to joining the NSF, Bement served as director of the National Institute of Standards and Technology for three years. During his career, he led research and engineering organizations for the Department of Defense; held distinguished academic and administrative appointments at Massachusetts Institute of Technology and Purdue University; administered and spearheaded research for TRW; and served as a senior scientist for General Electric. From 1954 until 1992, he served as a commissioned officer in the U.S. Army Reserves. And for many of these years, he was also busy on the home front, helping his first wife raise their eight children.

While every one of these jobs clearly came with great demands and responsibilities, Bement, 78, says that administering the NSF's multibillion-dollar budget (\$7.3 billion in 2010) was one of the most challenging.

One would think that leading the world's largest sponsor of fundamental science and engineering research for six years would provide a fitting capstone to his distinguished career, and make retirement an appealing prospect. But Bement had no such plans.

Rather, he was eagerly looking forward to returning to Purdue University, where he's been on a leave of absence since becoming director of NIST in 2001. He spoke about the Global Policy Research Institute that he's helping to establish on campus, and the institute's mission to elevate the role of science in policymaking.

The conversation lasted almost two hours; what follows are edited highlights of the exchange.

The pace of scientific and engineering research is faster today than ever. What do you see as some key implications of this for society?

It's not only that the rate of change has increased, but the time from concept to application has compressed. We used to think in terms of two or three decades to take a new idea and reduce it to practice. Now it can sometimes occur within a handful of years, or even a few months. This is partly because there are so many more people thinking along the same lines and pursuing the same research—they beat their ideas against each other so somehow one has a faster convergence model than just one person thinking off on their own. Some problems are at the level of complexity that one person can't have the breadth of insight necessary to see all the nuances and all the variables, so they are dealt with at the systems level, requiring teamwork and the sharing of insights among scientists in an interdisciplinary and a free-inquiry way. There are no set formulas for this. It's free-flow. Ideas are exchanged until suddenly something clicks, and then you can converge on a solution very quickly. That's going on around the world. You might come up with a new idea, but that doesn't necessarily mean you are going to be the one who is going to capitalize on it. Someone else is probably thinking about it and maybe has a better approach for reducing it to a practice of earning wealth out of it.

What accomplishment are you most proud of from your time at the NSF?

Establishment of the Office of Cyberinfrastructure is probably one of the greatest achievements and one of the most important. It clearly puts the U.S. in an undisputed leadership position when it comes to computation. Cyberinfrastructure is an integrating force that can take research and education to an entirely new plane of discovery, and OCI has enhanced the capability of building networking and high-end computational capacity at U.S. universities, including a network that spans the country and is connected with the world. It has already altered our familiar research, education and innovation landscapes; we have one petaflop-scale computer at the University of Illinois coming online in the next year or two. We have a Kraken computer at Oakridge National Laboratory that is right at a petaflop. So that's at least two that are ranked among the fastest computers in the world. And they are all interconnected on a network with a capacity of about five and a half petaflops. So that gives the U.S. more computing power for universities than any other nation in the world, and we can expect much more to come.

NSF's many international collaborations involve sharing valuable information with international competitors. How does this improve the United States' ability to compete with these same countries?

At the frontiers of science and engineering, competition is more blurred. It's important to know how to collaborate in order to know

how to compete. A case in point is our aerospace industry. For every major award for which they compete, they have to cooperate. They know more about each other than most industries know about their competitors. It's through that collaboration that they are able to compete at such a high level. I see it the same way in world markets. Scientists have always been fairly open in sharing their ideas and data. I think that openness is something we can continue to capitalize on.

What will be the determining factors for U.S. prosperity in the future?

Knowledge and the application of knowledge drive the economy. That's been true since the dawn of history, but the use of knowledge today has a much greater multiplying effect than ever before. The economy of the future will be driven by investments in education, research and infrastructure, especially cyberinfrastructure. The United States is still the dominant investor in these areas, but the rest of the world is increasing its investments at an extremely rapid rate, so the U.S. fraction is going down. In particular, we are being outgunned quantitatively by China and India in engineering training. If we fall behind, it would be very difficult to regain our position in markets. But we are a very adaptive society. Our corporations are totally integrated throughout the world, and I have great faith in the innovative character of American scientists and businessmen.

You've made STEM education a priority during your time at the NSF.

What should be our top priorities in this area?

To instill an understanding of science and technology, it's important to start teaching basic principles at a fairly early age, rather than wait until secondary education to take an inquiry-based approach to teaching how the world works. I think schools often underestimate what young people are capable of understanding and what will fascinate them. It's the difference between treating children like you can somehow cut their heads open and pour in knowledge, versus learning through their own inquiry, through projects, through self-based learning, through peer-learning. Many young people today are experts at social networking using PDAs, cell phones and electronics of various forms, but we have not yet learned how to turn that into an advantage when it comes to peer education and peer learning. We need to somehow develop learning networks where education becomes a 24/7 activity: continuous education giving continuous satisfaction to students through exploring the unknown and finding their own solutions.

Are there other ways you feel U.S. K-12 education can be strengthened?

We have ceased in some respects to honor the teachers and recognize the importance of their role in our society. I think education is daunting enough and challenging enough that it deserves much more attention as far as quality, as far as recruitment of top talent, and as far as freedom of inquiry and practice. So much is talked about in terms of teachers' salaries as a key determinant for attracting and retaining good teachers, and it is an important factor, especially for those who want to get married and raise a family. On the other hand, a lot of it has to do with respect, professional treatment, and again, the freedom to develop their own approach to education and try new things.

Mines celebrated its 136th Commencement last week. What advice would you give to this year's graduates as they launch their careers?

Manage your own career. Nobody is going to manage it for you. Have a clear sense of what you are good at and what you enjoy doing. Find something that will challenge you to continually learn. Be a work in progress. Don't paint yourself into a corner. Recognize when you get to the flat end of a learning curve, and when you do, go look for another learning curve—continually challenge yourself.

Build a network. Recognize that often success comes from those whom you learn from and impress in terms of your industry, your integrity, your openness and your adaptability. Most leaders are looking for adaptive people because change occurs so rapidly. Be willing to go to new parts of the world, adapt to new learning styles, to new organizational structures, to new ways of teaching, new modalities. If you start turning people down on the basis that it's outside your comfort zone, you get labeled in the network as unmovable. On the other hand, if you are excited about new possibilities and new opportunities and new challenges, then when opportunities arise, they will seek you out.

If you try to climb a ladder, you've got only one direction to go, so I encourage people to consider a spiral rather than a ladder. Move from one situation to another. You can be in the same universe, the same company, but seek out different challenges, different assignments. Maintain your flexibility. There are a variety of ways of seeing and defining a problem. Broaden your outlook through new knowledge. Explore new subjects: music, great books, political science, history.

Seek out managers who challenge you. The key to my satisfaction has been to always pick a person I could learn from and admire and feel good about working with; someone who can be a mentor, and who has an interest in my future. I can go through my entire career and look at how each step along the way was influenced by someone who was part of my network—someone I had worked with or worked for over time.

I was very fortunate. I had a wife and family who were willing to support me. But that was in the days when you didn't have more than one wage earner in the family. Now it's a many-bodied problem. We think we live in an age of mobility, but it's really almost an age of immobility, because often it's hard to displace two people at one time. And it may not be possible for everyone. In my case I'm beyond raising my own family. I'm raising the third generation, great-grandchildren, so I have some flexibility.

Are you optimistic about the future and the world your great-grandchildren's generation will inherit?

Obviously there are going to be major challenges. The future will be different. There will be fewer resources, which means that we will have to be very innovative in how we use them. I think that energy sustainability will change, and how we justify investments will change. It's really a question of how quickly our society will adapt to making investments now for returns in the future, rather than for immediate returns. That's a social conditioning, a behavior, which is

Clockwise from top left: Bement is welcomed to the South Pole, Jan. 2007 (courtesy: Peter Rejcek, NSF); Bement is nominated as director of the NSF by President G.W. Bush (Getty Images); Bement and the chairman of the Korean Science and Engineering Foundation sign a memorandum of understanding to promote cooperation, Aug. 2006 (courtesy: Jim Crawford, NSF).



compared with the other books. So I'd be reading Nietzsche during the break in the midnight shift, and he was reading another of Nietzsche's books, and we started talking. It was he who encouraged me to go to Mines. In fact, he helped me fill out the admission form, and then made a life-changing covenant with me. He agreed to put up the first semester's tuition. If I made it beyond the first semester, I wouldn't owe him a dime. If I didn't make it, I could pay him back out of my wages. As an in-state student, I didn't have to pass the entrance exam. They allowed me to attend for one semester to see if I could make it. If I didn't, I was out. So I had those two challenges in front of me. That first semester was a killer. If Colorado School of Mines taught me anything, it was how to succeed in spite of indomitable challenge. Once I got through the first semester, I wasn't going to leave.

The school has changed a great deal since then. How do you feel about the Mines of today, versus the institution you knew in the early fifties?

The school has done remarkably well. Mines has kept faithful to its niche, in terms of the natural sciences, mineral science and earth science, while other schools were moving away from these fields. Right now, we've gained perhaps the highest level of recognition for excellence among top-tier universities that wouldn't have accepted the school as a peer a few years ago. As an undergraduate university, it stands alone, and the graduate research program is very much stronger than it was in the past. Mines turns out a very special product.

When the interview ended—much too soon for me—I shook Bement's hand and took a last look around. A recently completed portrait sat on an easel in the corner—a stately full-body rendering of the director standing in his office. It was skillfully painted and likely composed to complement other portraits of his predecessors, but something didn't fit. It wasn't until later that I put my finger on it—he was standing still. Based on all that I had learned about the man, his life has been spent in motion. You can't achieve all that he's achieved standing still. And he still isn't. [M](#)

still in an emergent state. And it's still not clear whether our society is willing to adapt to take a longer view, but I think we can be happy with a lot less; I could be happy with a lot less.

We are educating people better, which means that young people have more opportunity, more choice. There's less hunger in the world today. There are more opportunities for women in the world, even though there are still areas where they are highly oppressed. Many argue that if you educate women and give them opportunities, it adds more to the stability of the world than anything else because of their social outlook.

But I'm optimistic about the younger generation. Children now are more excited about the future. They are less risk-averse. They are more willing to accept the future on its own terms. I think they take less for granted.

Why did you decide to come to Mines?

During my senior year in high school in Pennsylvania, my father was recruited to be the chief electrical/mechanical engineer at Climax Molybdenum Mine. After I graduated, I went to work at the mine as well. My supervisor, Prentice Gain, was a [1920] graduate of Mines, and we got to know each other because we were both reading Nietzsche. Someone had donated a set of German philosophy books to the reading room: As you can imagine, this was an unusual addition

Thomas Cooper, lightboximages.com

Tim Marquez's
journey from
credit card
debt to the
philanthropic
elite

By Ben Gose



Tim and Bernie Marquez during the groundbreaking for Marquez Hall in October

A Rough Road to Riches

"I made it out, but I hated it," says Tim Marquez '80, referring to the four years he spent earning his degree at Colorado School of Mines.

It was 1976 when he transitioned from Denver's predominantly Latino Lincoln High School in south Denver to the Colorado School of Mines campus, where fellow students walked around with calculators on their belts and hard hats on their heads. "It was pretty geeky," he says now.

Then the work started—not just the intense studying required to complete a petroleum engineering degree at Mines, but also the 30 hours a week he put in at the Coors plant to help pay his tuition.

"There was a lot of pressure and it never seemed like it ever let up," Marquez says.

As it turns out, pressure is something that Marquez (pronounced "Marcus") handles pretty well.

After making it through Mines, he quickly landed a job at Unocal in Southern California. Thirteen years later, chafing under the bureaucracy of a large company, he and a partner formed their own firm, Venoco Inc. Thanks to Marquez's keen eye for extracting new life from aging oil fields, as well as some shrewd deal-making, it's turned out to be a great decision, but there have been some bumps along the way, including an ill-fated partnership with Enron; being fired by his own board of directors; a struggle for control of the company; and a class-action lawsuit brought against Venoco and led by Erin Brockovich, the environmental attorney depicted in the 2000 movie starring Julia Roberts.

Despite it all, Marquez emerged intact and is happy to report that his life is much less dramatic these days. He's back in charge at Venoco, the company is doing well and, having amassed a sizeable fortune, he's devoting a lot of time and energy to giving it away—some to Mines.

Thanks in part to a \$10-million matching gift from the Timothy and Bernadette Marquez Foundation, Mines broke ground on a new building for the Petroleum Engineering Department in October. It will be named Marquez Hall.

Like many who succeed in business, Tim doesn't lack energy. "He has always been a very energetic, aggressive, go-get-'em type of guy," says Mark DePuy '78, who rented a room to Marquez just after he graduated from college, and who subsequently served as chief operating officer at Venoco. "There's no slowdown in Tim."

Marquez's frenetic pace isn't limited to his business life. When he took up snowboarding a few years back, friends estimate that he logged more than 40 days that season alone. He rises early each morning to swim, and sharply

cuts off late-morning meetings for his second workout of the day—a lunch-time run.

"If you want to go out for a casual run, Tim is the wrong guy to go with," says Bill Schneider '83, a former chief financial officer at Venoco. "He always wants to push it. He is enthusiastic on a lot of fronts."

But he's also clear about his priorities. Speaking to an audience of mostly Mines students in 2007, Marquez said, "When I was put out on the street by my own board, my family and friends all rallied around me. That's when I really realized what is most important in my life. I'm not a workaholic. I'm home every day at six o'clock. I help my kids with homework. In the end, who cares how much money you make or what station you rise to in life? Friends and family are what count."

Now that their youngest daughter is college, Tim and his wife, Bernadette, will likely be spending more time with friends, especially once they've completed a move from their home in a historic Denver neighborhood to a luxurious downtown apartment. Among the many advantages of their new location, Tim may be most excited about the prospect of being able to walk to Colorado Rockies games.

Tim Marquez is clearly committed to Mines these days, but that hasn't always been the case. Prior to announcing the \$10-million gift, he hadn't stepped foot on campus for twenty years—and he hadn't given the school a dime.

"It just dawned on me finally that I owe a lot of my success to the school," he says. "I've gone from no affinity for the school to having a real affinity for the school."

As anyone who keeps up with Denver news will know, the Marquezes' generosity isn't limited to Mines. In 2006,

working closely with Denver Mayor John Hickenlooper, he and his wife, Bernie, made a matching gift of \$50 million to create the Denver Scholarship Foundation. The five-year-old foundation has since provided college scholarships to students from Denver Public Schools totaling \$5.2 million, and the college counselors it places in every public high school in the city have helped students win additional awards worth another \$62 million.

Both Tim and Bernie are deeply committed to education and have strong ties to DPS. Tim's parents, Thomas and Beverly Marquez, both taught in the system, and all three of the Marquezes' daughters have gone through Denver Public Schools. Bernie chairs the State Board for Community Colleges and Occupational Education, as well as the board of the Denver Scholarship Foundation.

Tom Boasberg, superintendent of Denver Public Schools, says the Denver Scholarship Foundation deserves a good bit of the credit for recent improvements in the district: enrollments hit a high last year, and the proportion of graduates who are college-bound rose 20 percent, to nearly half of the graduating class.

"Tim and Bernadette don't believe in incremental changes," says Boasberg. "They believe in really major leaps forward. Anyone can say we need a huge increase in college matriculation, but they are also putting up an unheard-of amount of money to make that vision a reality."

The Marquezes' rise from the middle class to a spot among Denver's philanthropic elite began back in 1992 when they borrowed \$3,000 on a

Visa card to help launch the company. Their first acquisition—an oil field in Whittier, California, considered to be tapped out—cost only \$150,000, says Marquez. A year later, after installing more powerful pumps, the company was logging a profit of more than \$200,000 each month.

In 1998, when they permitted the energy giant Enron to buy a 26 percent stake in Venoco for \$60 million, it seemed like an excellent decision, adding value and liquidity to their growing company. But three years later, when the cash-strapped Enron asked Venoco to buy them out, a firestorm of complications ensued. As Venoco's largest shareholder and CEO, Marquez took one look at Enron's proposal and flatly refused. He didn't want to operate the company under such a burden of debt. However, his partners proved more pliable, siding with Enron, and their combined voting power was sufficient to force Marquez from his position as CEO.

Hurt and a little baffled by how fast things had come unraveled, Tim Marquez returned to Denver with his family, where he soon launched another venture. But he was not about to give up on Venoco, and a bitter struggle for control of the company ensued.

Ultimately Tim Marquez won. Threatened by a lawsuit brought by the former CEO, and with the company weakened from Enron's collapse and the Brockovitch case unresolved, his disgruntled partners finally agreed to sell him the 60 percent share of the common stock in Venoco that he didn't own—the price was \$14 million.

It is the best investment he's ever made. Just two years later, the price of oil had doubled, the Brockovitch case had been dismissed, and Venoco was well on its way toward its peak value in 2008 of more than \$1 billion. Even today, after being hit hard by the economic collapse in late 2008, the 60 percent share of the company he bought from his partners is worth about \$500 million.

"It's a great story," says Schneider, who helped Marquez arrange financing for the 2004 buyout. "If you believe in what



Thomas Cooper, lightboximages.com

Tim and Bernie Marquez (R) were joined by his parents, Thomas and Beverly, for the groundbreaking in October. Marquez Hall, depicted below, will be completed in summer 2012.





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Tim Marquez talks with operations supervisor Jeff MacDonald on Venoco's Platform Holly in the Santa Barbara Channel, approximately two miles offshore from Coal Oil Point, California.

you're doing, stick with it. Tim ended up getting 100 percent of his company back."

Despite the wild swings of the oil business, Bernadette's confidence in Tim has remained unshaken. She recalls with some pride that during the financial crisis of late 2008, when Venoco's value plummeted to around \$100 million, Tim's response was to buy three million shares.

Today his optimism is as strong as ever. With the world economy still in the doldrums, Venoco is moving ahead with a major undertaking in the Monterey shale. "It's a huge project by any company's standards," says Marquez, who estimates that there are more than 37 billion barrels of recoverable oil in the formation.

Tim admits it's somewhat risky, but risk hasn't stopped Marquez yet. Craig W. Van Kirk, a petroleum engineering professor at Mines and former head of the department, remembers having Marquez as a student 30 years ago. "Petroleum engineering students are generally hardworking, and willing to take risks," says Van Kirk. "But Tim was willing to work even harder and to take even more risk."

The Marquezes' \$10-million pledge in 2005 for a new building for the Petroleum Engineering Department was a valuable springboard for raising the additional \$15 million needed to complete the building. President Bill Scoggins remarked that the Marquezes' bold commitment inspired others to get involved. "We had really strong support from folks who went to school here in petroleum engineering and other geosciences," says Scoggins. "Just as importantly, the corporations that hire our students stepped up too." The project was further expanded in 2007 when the student body voted to allow a portion of their fees to be used to pay for a 25,000-square-foot, general-purpose wing.

The Marquezes say more education-related gifts are likely over time. Tim and Bernie applaud the recent push by Warren Buffett and Bill Gates to get billionaires to pledge half of their worth to charity, but they say the two richest Americans could have asked for even more. "Even if you want to lead a fabulous lifestyle, how much

money do you need?" says Tim Marquez. "Can you really use more than \$100 million? It just seems dumb to sit on it."

It's equally dumb, he believes, to pass such wealth on to children. While working in Santa Barbara earlier in his career, Tim Marquez says he observed a lot of "trustafarians"—young people coasting through life on trust funds. "That put the fear of God in me," he says. "That's not where I want our kids to end up."

Tim and Bernie have told their three daughters, who range in age from 19 to 24, that they will receive enough to cover the cost of college and a down payment on a house, but not much more. The majority of their fortune—as much as 95 percent—the Marquezes intend to give away.

All that said, Tim Marquez has nothing against a little extravagance. He doesn't own a private jet, but he likes to entertain, sometimes flying in employees and their partners to luxurious hotels near their operations in California for Christmas extravaganzas. He enjoys fine wine, and the couple owns homes in Beaver Creek, Colorado, and Santa Barbara, California, where Tim travels frequently for work. However, by far the largest outlet for their wealth is philanthropy.

In 2008, they pledged \$7 million for a nursing addition to a life sciences building at Michigan State University, where Bernadette earned her nursing degree in 1980. Tim, whose father is Hispanic, is eyeing what could be done throughout DPS to lift high school graduation rates among Hispanic boys. And in addition to the money they've placed in the Denver Scholarship Foundation, they've also placed another \$50 million in the Timothy and Bernadette Marquez Foundation.

They don't yet have plans for this money and, apart from the gift to Mines, have made only a few small grants to date. Eventually, however, they plan to give away most of their net worth through the family foundation. For now they are keeping their eyes open for the right investments.

"We want to make an impact. We want to find the next Denver Scholarship Foundation," says Bernadette.

Not surprisingly, the Marquezes' enthusiasm for philanthropy has permeated Venoco's culture. Bernadette oversees their corporate philanthropy program, which is directed toward the communities in which Venoco operates. A committee made up of employees from both California offices and their headquarters in Denver decide where the company's money is donated.

"The thing that I was impressed by is that it's not just the senior managers huddling up and figuring out where to give the money," says DePuy, who is now president of Great Western Oil and Gas Company. "It's the guys in the field, the clerks. Everybody has an equal say in the process."

Although they are now well-known in Denver for their philanthropy, the Marquezes don't seek attention for their gifts—initially they tried to make the \$50-million matching gift to start the Denver Scholarship Foundation anonymously. In the end, they were persuaded that their public involvement would help the foundation raise money.

Tim is also a little uncomfortable at the thought of seeing his name on Marquez Hall; but on the other hand, he's pleased that the building bearing his family name will pay tribute to the values of discipline and hard work that Mines helped to instill, difficult and painful though that process may have been. **M**

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The Network

Your 115-Year-Old Alumni Association

A message from Julia Hoagland, CSM Alumni Association President



The Colorado School of Mines Alumni Association was 15 when it launched *The Colorado School of Mines Magazine*, the forebear of *Mines* magazine. It was 1895, and much has changed since then, but I believe the association's values have remained constant: integrity, tradition, education, service, support, involvement and excellence.

This update, sent at a time when we are asking for you to renew your paid membership to the alumni association, is offered to help clarify the role and purpose of the organization, and its place within the larger Colorado School of Mines community.

One area of frequent confusion is the distinction between the alumni association and the Colorado School of Mines Foundation. This is not surprising—while both organizations are separate from one another, the lines can appear blurred.

The foundation raises money for the school with a net that reaches far and wide, providing scholarships and aid to numerous programs. The alumni association is concerned with fostering and strengthening a worldwide Colorado School of Mines alumni community that is responsive to its members and supportive of the school. Along with publishing this magazine, the alumni association staff achieves this by providing logistical support for a wide variety of events and programs on campus and around the world, most initiated and run by volunteers and section coordinators. To pay the bills, the alumni association mounts an annual membership campaign,

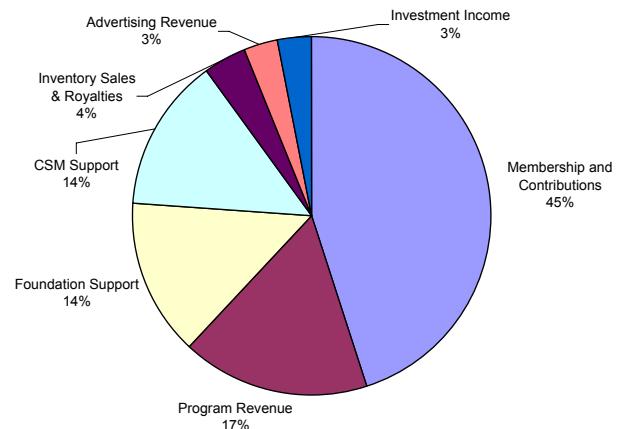
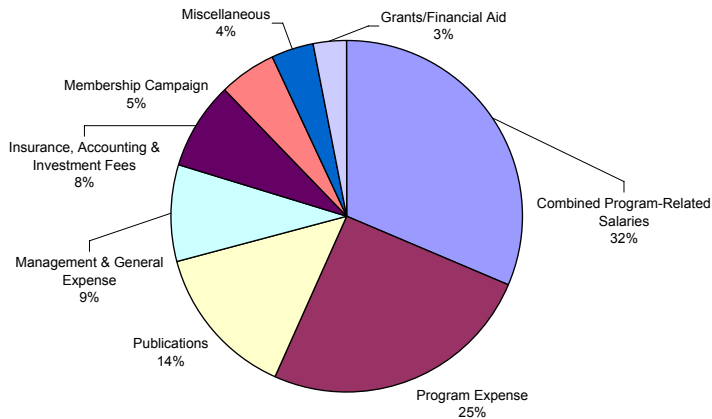
which means that, like the foundation, the association asks for your support, primarily in the form of annual \$55 memberships.

At the 2010 Leadership Conference at Mines, sponsored in part by the alumni association, keynote speaker Craig Valentine said, "People buy into what they create." I believe this is particularly true for the alumni association; with each investment we make, I believe the association gets a little stronger. Many times each year the association makes it possible for alumni to hire one another; to refer prospective students; to gather, learn, network and socialize together; to mentor current students, or volunteer in other ways in support of the school or the alumni community; to locate fellow alumni with whom to consult professionally; to invest in the future by supporting the CSMAA Legacy Grant program, endowment funds, or by sponsoring students at events; and to show their Mines pride through CSMAA membership.

The association recognizes dues-paying members in an online annual report and by providing a package of special services and benefits; at the same time, the Colorado School of Mines Alumni Association has always considered every graduate a member. As such, all 24,000 Mines graduates around the world are represented by the association's 18-member board of directors, which includes one school trustee, a faculty member and two student representatives (see page 37 for a list of current board members). Many of us travel from afar to attend board meetings, serve as the alumni's voice in the affairs of the school, and provide fiduciary oversight and direction for the association.

Membership dues and donations from senior members constitute the largest source of annual revenue for the association. Support is also generated through license plate sales and two affinity programs—Bank of America credit cards and Liberty Mutual Insurance. Since the association also provides services to the school and the foundation, both provide the association with supplemental financial support. An independent organization, CSMAA files its own

Alumni Association Expenses and Revenues for Tax Year 2009



tax return, is audited annually, and is led by an executive director who reports to both the alumni board and the school president.

As someone personally acquainted with most of the alumni association's staff, I know first-hand how hard they work to respond thoughtfully to alumni input. In 2009, based on survey results, the staff incorporated an academic department reunion into the annual reunion, inviting all Petroleum Engineering Department alumni back to campus. In 2010 it was the turn of Mining, Geology and Geophysics; and in 2011, alumni from Economics and Business will gather. When the magazine inquired about content preferences, alumni asked for more people profiles—just take a moment to read those featured in this issue. In response to requests to combine social and networking events with substantive learning opportunities, the staff is preparing for a special series on nuclear energy for alumni and friends to be held in Denver, Houston and Washington, D.C. in 2011. And in the current campus climate that encourages exchange between the school and alumni, the association is building various collaborations with academic departments, the administration and students—our future fellow alumni.

We hope this update is informative and helps to explain how the alumni association operates to support the school and alumni community. If you would like to share your ideas about programming, please get in touch with the association (303.273.3295 / CSMAA@mines.edu / CSMAA, P.O. Box 1410, Golden, CO 80402). And if you want to put a little muscle behind your ideas, even better—we always value and encourage the work of volunteers. That is, after all, our job: to encourage all alumni to keep in touch, stay connected, get involved and give back.

CSM Alumni Association

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John Howe '83
President-elect

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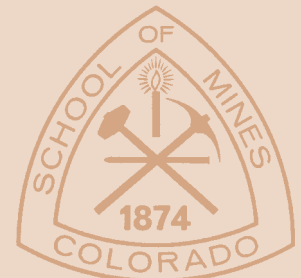
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Honoring Our Own

It is once again that reflective time of year when we ask you to help us identify outstanding alumni for their service to the alumni association and the school—special individuals who have served the broader Mines community through work they have done, or young professionals who have demonstrated a commitment to do so in the future.

Professor Emeritus Robert (Bob) Weimer is one such individual who was honored with the Melville F. Coolbaugh Memorial Award in 1995. We share with you here his observations on receiving the award.



What did being awarded the CSMAA Coolbaugh Memorial Award mean to you?

Mines awards have always had a deep meaning to me because I was judged and selected by those who knew me best. I was especially grateful to receive the Coolbaugh Memorial Award because it recognizes individuals who have contributed to improving the image and enhancing the reputation of Mines, an institution for which I have great respect and admiration. Mines' reputation is primarily due to the performance of its graduates throughout the world in natural resource fields, but I am proud to have been recognized for my small contribution as a professor to those graduates and the school.

What words of wisdom would you have for alumni, especially those who admire the school from a distance but for one reason or another don't get involved?

Much has been written about the benefits and rewards of volunteering for organizations with whose missions you agree. My volunteer work for Mines and other organizations has been personally gratifying. I am confident any alumnus or alumna would likely have similar feelings. Involvement could include nominating a fellow Mines graduate for an award, attending or helping to organize local section meetings, serving on committees, financially supporting the school and departments, or encouraging prospective students to attend Mines.

What drives your passion to remain involved with faculty, students and alumni?

My career as an educator was extremely satisfying because of contact with these many stakeholders and their activities. It has

provided a lasting learning experience. A wise man once said, "Every day you don't learn something new, you die a little faster." I believe that sentiment to be true.

To help us honor alumni or other special members of the Mines community, please visit the Hall of Fame section of minesonline.net, where you can fill out a short nomination form for the awards listed below. Your help in identifying candidates for further consideration is greatly appreciated. If you wish to nominate a candidate by mail, simply write a letter to CSMAA Award Nominations, P.O. Box 1410,

Golden, CO 80402. Include the nominee's name and briefly explain why you would like to honor the individual. Be sure to include your name and contact information.

Alumni Association Awards

Outstanding Alumnus Award

Awarded to an alumnus/a who is a member of the alumni association and has contributed meritorious service on behalf of CSMAA.

Young Alumnus Award

Conferred within 15 years of earning a degree from Mines, this award recognizes individuals who have demonstrated their loyalty to the school and a commitment to serving Mines and the alumni association in the future. Nominees must be no more than 40 years old.

Melville F. Coolbaugh Award

This award recognizes individuals who have made an outstanding contribution toward improving the image and enhancing the reputation of the Colorado School of Mines. It is not given posthumously.

Nominate someone you know and respect by going to minesonline.net and clicking on "Hall of Fame."

Congratulations to CSM Magazine on 100 years!



Bruce Kugler
Patent Attorney, Principal
B.S., Petroleum Engineering,
1981



Doug Swartz
Patent Attorney, Principal
B.S., Mining Engineering,
Minor in Metallurgical
Engineering, 1982



Brad Knepper
Patent Attorney, Principal
B.S., Electrical Engineering,
1998



Matthew Ellsworth
Patent Agent/Technical Specialist
B.S., Engineering, with honors, 2003
M.S., Engineering Technology
Management, 2005
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"CSM Career Services and department faculty consistently perform a fantastic job in helping students and employers connect for internships and new graduate positions." Freeport-McMoRan

"The School of Mines is awesome! Career Events at this school are so well organized, professional. Thank you for all you do!" Aera Energy

"Friendly, helpful staff. Students are first-tier. Stellar turnout of quality grads at Career Day." Schlumberger

"The Mines' career fair has been the best organized/run fair that I have attended." Mortenson Construction

"Our recruiting efforts are centered on the Career Fair and we continue to find excellent candidates at the event." Shell

Fast Forward

Class Notes
Weddings
Alumni Profiles
Births
Passings

1950

Walter M. Halper 

1953

Harry O. McLeod Jr. 

1956

Nathan M. Avery is a managing member for GH Services LLC and lives in Houston, TX.

1958

James J. Laidler is a distinguished fellow for Argonne Nation Laboratory and lives in Lockport, IL.

1960

Jon R. Kirkpatrick 

1962

Charles R. Vestal is a lecturer for Colorado School of Mines and lives in Denver, CO.

1963

J. Warren Andrews is a part-time technician for the City of Golden and lives in Golden, CO.

Robert D. Coale is the president of Patriot Gold Corp., in Las Vegas, NV.

1964

John C. Schmidt 

1965

Keith S. Olson 

William R. Wilson is an executive vice president and CFO for ARNEVUT Resources Inc. and lives in Arvada, CO.

1966

Robert W. Murray is a vice president for Webb, Murray and Associates, Inc. and lives in Seabrook, TX.

1967

Steven Tipton 

1968

Robert C. Pahl is the president of Metalink LLC and lives in West Lafayette, IN.

Bruce R. Palmer is interim associate dean for research and graduate studies/CHEN professor for Texas A&M University at Qatar.

1969

Roland E. Blauer is the president of Nautilus Resources, LLC, in Denver, CO.


Todd A. Brown 

James A. Krebs, Jr. is a director for Concord Energy LLC and lives in Golden, CO.

Jon C. Sprague is a teacher and lives in Fallon, NV.

1971

Stephen P. Antony is the president and chief executive officer of Energy Fuels in Lakewood, CO.

Nick J. Lavingia is a project management advisor for Chevron and lives in Danville, CA. 

Roger A. Newell is a member of the management team for Lake Victoria Mining Company Ltd. and lives in Golden, CO.

1972

Joseph D. Butkovich, Jr. is a project director for URS Corporation and lives in Parker, CO.

Dave Chapman is a Montana office manager for F and H Mines Supply and lives in Pony, MT.

Rick R. Schmid is the president, geophysics for Technology Plus and lives in Houston, TX.

Pamela R. Tittes is founder and president of Tittes Mining and Construction Consulting LLC and lives in Denver, CO.

1973

Lynn M. Dayton 

Richard M. LiConti is a vice president & general manager for Eickhoff Corporation and lives in Washington, PA.

Jefferson D. McKenzie is a coal mining engineer/economist for the Bureau of Land Management and lives in West Valley, UT.

1974


Donald T. Breffle is a senior environmental engineer for National Older Worker Career Center and lives in Morrison, CO.

Jack D. Cline is a project director for URS Corporation and lives in Mandeville, LA.

James A. Coates is the president of Wind River Mining & Engineering Co., in Casper, WY.

Michael A. Dover works in applications software for Critigen and lives in Parker, CO.

Frederick W. Obernolte, Jr. is a senior associate for Access Environmental, LLC and lives in Franktown, CO.

 denotes an individual who has posted photos on Minesonline.net between May 1 – Oct 31, 2010.

Weddings



Todd McGurk MS '06 and **Laura Addressio MS '07** were married August 28, 2010, in Florence, OR. Their reception, held at Heceta Head Lighthouse, was attended by several alumni and current Mines students.



Ryan Miles '07 and **Julianne Launi** were married on September 10, 2010, in Waynesboro, VA. A total of 19 Mines alumni were in attendance. The couple now live in Lakewood, CO.



Zachary Trenbeath '09 and **Elaisha Whetzel** were married July 26, 2009, in Colorado Springs, CO. Among the guests were several Mines students and alumni.



Geoffrey Sterling '09 and **Amelia Scott '09** were married in Elizabeth, CO, at the Rambler Ranch on July 10, 2010. Their ceremony was attended by several alumni, current Mines students and Bruce Geller, curator of the Mines Geology Museum.



Jon Jay Charzynski '10 and **Kasia Kuzniak '09** were married on a beach on Lake Huron in Port Sanilac, MI, on Friday, August 13, 2010. In attendance were several alumni and current Mines students.



Bryan K. White '07 and **Brittney L. Hladky '10** were married on June 19th, 2010, at Mc C Ranch in Masonville, CO. Twenty-five Mines alumni were in attendance, including Bryan's brother, **Timothy White '05, MS '06** who served as a groomsman.



Dan Stackhouse '07, MS '08 and **Jacquelyn (Jacqui) Schmalzer '07** were married on May 22, 2010, in Golden, CO. The wedding party included 10 Mines alumni.

To include your recent wedding in *Mines* magazine, email details to magazine@mines.edu, and include a selection of high-resolution digital images.

1975

Stewart Fieldman 📷

Steven A. Lambert is a senior advising petroleum engineer for Chevron and lives in Anchorage, AK.

Andrew H. Plummer is on the board of directors for Whitehaven Coal Limited, based in Sydney, Australia.

David R. Spedden is director, mine strategy and planning for Mosaic Company and lives in Fort Meade, FL.

1976

Randal L. Bruno is a senior project manager for Innovative Technical Solutions, Inc. and lives in Stockton, CA.

Kadri Dagdelen, a professor at Mines, was named head of the Department of Mining Engineering in August. He lives in Lakewood, CO.

Jerry Evans 📷

Mark K. Lunsford is working for Hampstead Management Group and lives in Lakewood, CO.

Clifford A. Maddocks is a senior mining engineer for Lehigh Hanson Company and lives in Orefield, PA.

1977

Robert L. Griffis is a system engineer for Los Alamos National Laboratory and lives in Los Alamos, NM.

Patricia I. Hagar is an advanced senior geophysicist for Marathon Oil Corporation and lives in Houston, TX.

Lawrence J. Holcombe 📷

Alumni

Fast Forward

1978

Tariq I. Ahmad 

Michael W. Calahan is owner of Integrated Packaging Solutions and lives in Arvada, CO.

Bradford F. Malin is working for Alabama Company and lives in Schererville, IN.

Kevin A. Small 

Bruce E. Weiler is a flow station 3 operations team leader for BP Exploration (Alaska) Inc. and lives in Anchorage, AK.

Frederick N. Williams is working for Zion Solutions and lives in Rowe, MA.

1979

Ronald M. Boyd is a business line manager for Atlas Copco Secoroc LLC and lives in Arvada, CO.

John W. Childers is a self-employed printed circuit board designer. He lives in Lone Tree, CO.

Richard J. Duszynski 

Alana Harness is a merchandising supervisor for Wal-Mart and lives in Fairbury, NE.

Mark M. McKinnon is an ALMA project manager for National Radio Astronomy Observatory and lives in Charlottesville, VA.

Peter B. Papazian is an electrical engineer for the U.S. Department of Commerce. He lives in Golden, CO.

Dennis A. Pieters 

William B. Schafer III is a senior VP/general manager for Bio Fuels Inc. and lives in Boulder, CO.

Andrew K. Todd is a project engineer for KBR and lives in Golden, CO.

Michael A. Walker is a manager - metallic materials and processes for Spirit AeroSystems and lives in Wichita, KS.

Martin D. Wittstrom, Jr. is general manager, South America for Niko Resources and is based in Calgary, Canada.

1980

Nanette A. Avril is an attorney in Littleton, NH.

Kevin H. Bjornen is a fluids specialist for ConocoPhillips and lives in Bartlesville, OK.

Alan R. Clemens is chief of geology and geophysics for Quantum Energy Partners. He lives in Montgomery, TX.

Jeffrey R. Corwith is a principal reservoir engineer for ConocoPhillips Alaska, Inc. and lives in Anchorage, AK.

Lester L. Crum is a pricing manager for Qwest and lives in Littleton, CO.

Dana A. Echter is a manager for Xcel Energy Inc. and lives in Arvada, CO.

Bruce D. Hansen is CEO for General Moly Inc. and lives in Golden, CO.

J. Michael Liittjohann is a turnarounds and reliability manager for Chevron Phillips Chemical Company LP. He lives in Spring, TX.

Terry L. Mead is a Europe/Africa real-time manager for Schlumberger, Ltd. He lives in Austin, TX.

Kenneth W. Snodgrass is a general manager - Northwest Region for Shell Oil Company. He lives in Kingwood, TX.

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Profile

The Rough and Tough of Diamond Mining

As he prepared to graduate from a private prep school in the tiny suburb of Milton, Mass. in 1982, Eric Friedland '86 was well aware of what was expected of its graduates: Ivy League colleges; careers in law, medicine or the like; and settling down somewhere in or close to New England. But Friedland had other plans.

He'd known he wanted a career in geologic exploration since age 17. "They were all going to Harvard or Yale, and no one knew what the School of Mines was all about. But I had the bug. I knew what I wanted."

Three decades later—a string of ventures behind him (some successful, some not), as well as a mining tragedy that prompted a two-year hiatus from exploration—Friedland's unconventional career choice is poised to pay off big, as his Vancouver-based Peregrine Diamonds Ltd. works to uncover what could be the most important diamond discovery in decades.

In just two years of exploration at its Chidliak site on Canada's frigid south Baffin Island (a desolate chunk of rock and ice straddling the Arctic Circle), the company has discovered 50 kimberlite pipes—columns of volcanic rock that often contain diamonds. Samples have already shown at least five to have "economic potential in arctic settings," says Friedland, and he suspects that many more are yet to be discovered. If all goes as expected, analysts predict that their joint venture with mining-giant BHP Billiton could rival Canada's colossal EKATI Diamond Mine, which has produced over \$5 billion worth of diamonds since opening in 1998 and is estimated to be worth roughly \$500 million annually for the next 25 years.

"Chidliak is the most-watched diamond project in the world right now," says John Kaiser, a California-based analyst who specializes in Canadian resource stocks. "He stands to make a fortune on this."

But Friedland is the first to admit, his career has had its ups and downs.

The younger brother of the controversial international mining financier Robert Friedland, he first got interested in the business at age 16, after spending the summer working on one of his brother's gold operations in Oregon.

By the fall, his mind was made up: "I was hooked," says Eric, who today remains as enthusiastic about this career choice as ever: "It's like being a kid. You are engaged in the ultimate Easter egg hunt."

After graduating from Mines in 1986 with a degree in geophysical engineering, he took a job at Summitville Mine in Colorado, which was owned by his brother's company, Galactic Resources. The highly publicized Environmental Protection Agency's closure of the mine due to acid runoff problems was still five years off (as was his brother's \$28-million settlement over the affair), and for Eric it was a great opportunity to learn the



ropes—which he did, doing everything from metallurgical testing to leading mine tours.

In 1987, still in his twenties, Eric ventured off to Alaska, where he was instrumental in discovering, developing and financing the colossal Fort Knox gold deposit, which to this day continues to yield about 300,000 ounces of gold per year for Kinross Gold Corp.

By 1997, Eric was on a roll, with his own company, DiamondWorks, opening mines in the politically fragile countries of Sierra Leone and Angola.

"It was the Wild Wild West in the darkest part of Africa. It was dangerous, but ignorance is bliss. I wanted to take a chance," he recalls. "Knowing what I know now, I wouldn't have done it."

When a military coup broke out in June 1997, in Sierra Leone, DiamondWorks chartered a helicopter to retrieve its employees and shut down operations.

Then, in November 1998, armed rebels stormed another of the company's mines in nearby Angola, opening fire on employees and kidnapping several. In the end, eight were murdered, including hostages.

"I was involved in hiring some of these people and was involved very intimately in trying to get them back, but the end result was devastating," recalls Eric. He stepped away from the mining business for two years after the tragedy, starting a tree-trimming business in Vancouver. "It set me back quite a bit emotionally."

But he couldn't stay away for long. Since founding Peregrine from his home office in Vancouver in 2002, Eric has built the company into a formidable enterprise, with two diamond districts under exploration, a secondary interest in metals and a climbing stock price.

As Kaiser puts it, he is viewed in the industry as the kinder, gentler kid brother of the uber-successful, but "somewhat ruthless," Robert Friedland.

When asked who he credits most for his success, Eric doesn't hesitate: his parents. His father survived three years in Auschwitz, while his mother worked as a forced laborer throughout the Holocaust.

"One thing I learned from them is you never give up," says Eric. "You just never know what the next day will bring."

—Lisa Marshall

Editor's Note: Alumni from classes 1981 to 2010 who have recent updates online or have uploaded photos to minesonline.net over the last six months are listed below. In addition, all class notes published in *Mines* magazine in the last four years are available on the site. When you visit, take a few moments to enter your latest information and upload some photos—we'll then list you here in the next issue of *Mines* magazine.

Instructions for viewing class notes and photos online

If you have never logged in to minesonline.net:

1. Go to minesonline.net and click the red "First Time Login" link at the top right of the homepage.
2. Enter your name and select your green circle next to your record (if your name appears twice, select the record that lists your degree).
3. Enter your authenticator ID. (Printed above your name on the back cover. Can't find it? Email CSMAA@mines.edu.)
4. Create your username and password, then confirm/correct contact information on the subsequent pages.
5. Click "My Stuff" tab and select "Class Notes," and begin your search.
6. To view photos, you may need to click on the individual's hyper-linked last name when you arrive at the class notes results page.

If you have previously completed first time login:

1. Click the red "Login" link at the top right of the home page.
2. Enter the username and password you created for yourself.
3. Update information if necessary. Go to #5 above.

📷 denotes an individual who has posted photos on Minesonline.net between May 1 – Oct 31, 2010.

1981

Nicholas W. Atencio
Stuart A. Dirks
Louise Koss
Mark J. Ludwig 📷
Frank J. Marrone 📷
Richard P. Smith
Floyd D. Varley
Joseph J. Voelker
Charles R. Wagner
Mark T. Winter

1982

Brent L. Carpenter
Diana T. Cheatum
Matthew R. Earlam
David H. Jerome 📷
George W. Moseley 📷
Michael P. Nemeth
Thomas A. Neville 📷
Thomas O. Rice
Jon G. Walker

1983

Jeffery H. Altman
Stephen W. Cook
David L. Cox 📷
Lance R. Hardesty
Thomas D.
Lookabaugh 📷
Ellen Morris
Norma I. Mozee
William S. Schneider
Paul A. Sease
Wayne W. Watson

1984

Bobby D. Brady, Jr.
Barton R. Brookman, Jr.
Douglas O. Buckland
Joseph M. Culkin
Craig A. Fulton
Arvind K. Garg
John R. Guffey
Rick T. Hildebrand
Matthew C. Holdeman
Julie A. Kupecz
Stan Lee
Linda G. Martin
Christopher G. Olson
Colleen T. Porro
Ronald J. Roberts
Jerome D. Strahan
Stephen G. Swinney
Mark I. Vlcek

1985

Kelly Sue Belanger
Jeffrey S. Castor
C. Mitchell Cox
Gonzalo Garcia-Huidobro
Carla A. Grano
James L. Harris 📷
Craig M. Lis
Gordon W. Paterson
Stephen F. Voss

1986

Peggy J. Christie 📷
Eric D. Emerson

S. Scott Gutberlet
Michael J. Hawkins
Joseph C. Kay III
Mark G. Kittridge 📷
Susan E. McFaddin 📷
Kyle A. Moreau
Charles H. Murray
Julye A. Nugent
Mark L. Peak 📷
Nathaniel E. Putzig
Duncan W. Riley Jr.
Marcelo Solano
Jeremy Zimmerman

1987

Jeffrey L. Bibbey
Todd P. Courtney
Scott B. Daves
Richard A. Elder Jr.
Nicholas M.
Giallourakis 📷
Nicholas M.
Giallourakis 📷
Philip E. Hecker, Jr.
Steven B. Hinchman
Barbara C. and Robert
K. Kingery, Jr.
Matthew P. Reilly
Dominic Ricotta
Randy L. Smith
Paul J. Taylor 📷
Scott R. Thomas
Thomas W. Wells

1988

Chris E. Bement

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For additional information, please contact
Rosie McDermott Director of Annual Giving
303.273.3153 or rosie.mcdermott@is.mines.edu



Class of 2031



Kirk L. Johnson '97 and Regina M. (Cristofano) Johnson '97 announce the birth of their second daughter, Emma Grace, born April 21, 2010, in Durango, CO.



Jonathan '06 and Caitlin (Hogan) Wilson '06 announce the birth of their son, Josiah Mark, on June 14, 2010.



Clay '07 and Leah Rosson have a charming new daughter, Aubrey Nicole, born on May 5, 2010, at Community Hospital of the Monterey Peninsula in Monterey, CA.



Jessica (Sorensen) Dixon '99 and her husband Bob are excited to announce the birth of their third son, Archer Theodore, on May 15, 2010. He joins big brother Ireland Gordon. Older brothers, Esten (7) and Ryan (4), just love him!



Rachael Selby '02 and Joseph William Selby '02 welcomed their second son, Archer Theodore, on May 15, 2010. He joins big brother Ireland Gordon.



M. MacLean Price '95 and Amber (Storch) Price '97, MS '99, along with big sister Ashlyn and big brother Alex, welcome the arrival of Jessica Lynn on May 17, 2010.



Kelly '97 and Matthew McAughan announce the birth of their son, Jake Thomas, on June 10, 2009, in Houston, TX.



Travis and **Brynn (Vasboe) Boyd '05** announce the birth of their daughter, Jacquelyn, on March 18, 2010.



Clive Captain Binkley was born on January 30, 2010, to **Ryan '00 and Sabrina (English) Binkley '00**. He joins big brother Simon (4 1/2) and already sports a lil' Mines hoodie all around town.



Levi '02 and Erin Campbell celebrated the birth of their son, Brady, on November 18, 2009.

Curtis H. Farmer
Gregory L. Griffitt
Justine E. Johannes
Thomas D. McDonald
Michael R. Montano
James L. Mueller
Randal D. Strauss P.E.
Eric W. Vestal
Dennis M. Vidmar
Matthew M. Weaver

1989
Andrew L. Baker
Donald W. Baker
Robert L. Elliott
Matthew W. Erker
Eric M. Gopsill

Andrew C. Head
Laura A. Laffoon
Michael C. Pierce
Steven D. Sparkowich
Timothy G. Thompson
L. Andrew Torres

1990
Brett D. Ashford
Jamie J. Boening
Luigi A. Greco
Douglas R. Howard
Tim Howard
Harald G. Jordan
Weston M. Mikulich
Stephen W. Miller
Marcos L. Schroeder

Wendi F. Smith
Michael C. Vincent
Michael P. Whelan
Salah A. Zugail

1991
Larry Adamson
Colin J. Basye
Derende M. Coover
Michael R. Demong
Richard C. Ginder
Esa I. Kivineva
David H. Prey
James H. Ruble III, P.E.

1992
William T. Beltz, Jr.
John B. Fairbanks
Scott A. Fournier
Hans C. Hoppe
Elviera T. Putri
Alisa L. Ramey
Teresa A. Ross
Blaine K. Spies

1993
Dean R.K. Bell
Douglas K. Kent
Robert C. Klug
Peter Long
Torsten M. Lyon
Amanda M. O'Connor

Gregory E.E. Smith
Russell E. Stands-Over-Bull
Ronald P. Stoltz
Khanh Q. Vu
Wesley J. Weber
Runing Zhang

1994
Brian A. Briggs
Robin S. Buchan
Darren A. Buck
James H. Covington
Hector L. Cruz
W. John DeCooman, Jr.
Daniel Jones
Mark S. Paschall

Profile

Prospering by Degrees

“How is this going to be useful for the village?” Durga Prasad Kar’s father would ask as his son continued to add to a portfolio of academic qualifications. Kar MS ’02, PhD ’10 holds an engineering degree and an MBA from universities in India, a post-graduate diploma in electric power earned in Norway, and a master’s and PhD in economics from Mines.

It wasn’t until he got to Golden that Kar figured out the answer to his father’s question. He was studying the economics of the electric grid, the efficiency of free markets and emerging solar technologies, when he finally realized how his academic work could be applied to village life in rural India where he grew up.

“I thought, the problems of rural India—where villages have no reliable source of electric power—can be reversed by using renewables and market competition,” says Kar.

In 2003, just two years after beginning his doctoral program, Kar and his wife, Shreemayee, founded Alternative Development Initiative for Rural Engagement (ADIRE), a nonprofit aimed at improving the lives of the rural poor in India through appropriate technology, renewable energy and local capacity building. Around the same time he also changed his PhD thesis to a comparison of the costs of the government-subsidized rural electric grid in India with off-grid solar photovoltaic generation.

“India has over 600,000 villages with 700 million people, two-thirds of whom lack access to electricity and clean cooking fuel,” says Kar. “Many of them lack basic necessities, such as roads, access to clean water, even mosquito nets. These people are so poor, and the electricity they can access is so unreliable, there are no income-generating activities available to them. This leads them to leave the village and migrate to the cities, where they live in slums and consume more fossil fuel.”

Kar believes that rural access to small-scale, reliable and renewable energy is one key to slowing rural to urban migration. The per-person demand for electricity is much lower in rural areas than in urban ones, and can be met locally from renewable sources at a lower cost than expanding the grid, Kar adds. Not only does this enable more people to remain in their villages, carbon footprints are also reduced.

ADIRE began its work in a small village in Orissa, a poor



Clockwise from top left: Kar speaks about microfinance opportunities; without a reliable electrical grid, technology use depends on photovoltaics; Kar discusses alternative water supplies with his uncle, Madhab Dash

state in eastern India, but has since expanded to other villages, with initiatives in health and hygiene, education, skills training, microfinancing and renewable energy generation. In an impoverished area of one village, they built a brand new solar-powered school that is also used as a skills-training center for adults. Villagers staff the school and maintain the solar technology, as well as the laptops, DVD players and LED projectors.

ADIRE has become a family business: Kar and Shreemayee travel to the area annually, where even their daughters get involved by teaching literacy, English language and dance. During the rest of the year, Shreemayee manages school, microfinance and production activities from their home in Green Bay, Wisconsin. Kar’s mother helps out with various projects from her community in India. Kar’s father died in 2006 aged 83, but until shortly before the end of his life, he was going house-to-house collecting data for Kar’s thesis.

Just before this issue of *Mines* magazine went to press, Kar was awarded his PhD. While it is the greatest achievement of his academic career, attaining it has been much more than an academic exercise. “I used to tell my father, ‘No one person can make a change,’” says Kar, recalling how he’d sometimes respond when his father questioned him about his protracted education. But Kar is proving himself wrong, which is a good thing for more than one thousand families that ADIRE has touched so far in rural India.

—Anne Button

Robert W. Patlovaný ☐
Harry J. Sorensen
Craig R. Walters

1995

Mohamed A. Alshami
Rick E. Ayer
Chad W. Fisher
William M. Moss
Justin W. Oleson
Scott J. Verhasselt ☐

1996

Susan F. Aberle ☐
Jonathan M. Bloomfield
Anh-Khoa N. Bui
David W. Creager
Daniel J. Cutting
Ryan S. Dickinson
Jason W. Goodall
James J. Heaps-Nelson
Megan L. Hessee
Jason S. Johnson II
Matthew K. Johnson
Darvin H. Jones
Christopher

G. Locallo ☐
Dawn A. Marlow
Hannah J. Moore
Matthew B. Moore
Jeffrey A. Renz ☐
Steven R. Schiesswohl
Roger N. Thompson
Wendy M. Weiman

1997

Donna S. Anderson
Jeffrey Scott Brown
Misty Coburn
David D. Crichton IV
Scott J. Dennis
Richard A. Ernst ☐
Ami N. Gignac
A. Scott Goldberg
Jamie J. Happ
Tiffany A. Horn
Regina Johnson
Troy T. Laman
Miguel A. Marquina
Antonio J. Miller
Ronald T. Naldoza
Paul B. Panozzo
Matthew T. Sarles
Terry L. Stahr
Lihua Yang

1998

Gloria E. Aranda
Virginia D. Carroll
Donald W. Conley
Heather M. Holland

Ronald R. LePlatt, Jr.
Richard A. Putnam
Patrick D. Sandoval
Keith D. Siggins
Amber T. Vail
Frederick S. Wegert
Cyndi M. Wheeler ☐

1999

Joseph P. Anaya
K. Matthew Arnold
Joseph D. Beach, Jr.
Donald W. Bucholz
Michelle Busse
Jessica Dixon
Heather D. Estabrook
Garrett C. Haag
Chris M. Hughes
Michael Andrew Jones
Richard L. Parkes
Dedi Sadagori
Franck Sery
Jackson A. Unrau
Alexis K. and Jim Wooll
Owen D. Young III

2000

Shayma A. Ahmad ☐
Pedro L.
Alonso Lopez ☐
Leslie A. Baca
Bryan C. Borum
Austin A. Crane
Michelle R. Davis ☐
Michael C. Driscoll
David A. Estabrook ☐
Philip D. Flammer
Josephine R. Hernandez
Steve E. Jeltema
David A. Kuntz
Kane K.T. Lee
Matthew D. Lengerich
David E. Stillman
David E. Stockton
Michael S. Watkins

2001

Chad D. Canfield
Shannon B. Canfield
Brian F. David
Mark W. Elliott
Robin C. Fox
Andrea Resch Gardiner
Devon A. Harman
Misty G. Jackson
Nathan M. Mascarenas
Christopher T. Mills ☐
Damdinjav (Mike)
Munkhbold
Paula A. Oransky
Derek L. Richard

Judy L. Rincon
Scott A. Strong
Whitney J. Trainor-
Guitton
Joshua J. Viets
Binxian Wei
Alex N. Yancey ☐
Michael B. Zoll

2002

Erin R. Arndt
Tara R. Bump ☐
Levi R. Campbell ☐
Kester D. Clarke
Eli A. Deutscher
Nathan R. Dutzmann
Sandy Fecko
Bryan T. Finn
Jim Huang
Shaun C. Jensen
Amanda K. Kimball
Christian L. Marsh-
Frydenlund
Zachary T. Miller ☐
Leslie Piggott
Anders D.C. Rasmussen ☐
Neal A. Retzer
Michelle L. (Anderson)
Rodriguez ☐
Jason A. Rurup
Lora B. Saeler ☐
Michael J. Sittner
Jennifer G. Smith

2003

Matthew J. Alms ☐
Stephanie L. and Dustin
E. Bennetts
Matthew J. Berg
Kim N. Bogue
Birgit Braun
Michael S. Cerbo
Troy A.H. Delaplain
Matthew R. Ellsworth
Chip D. Karo
Drew-Daniel T. Keefe
Alyssa M. Kohlman
Bryan N. Lawson
Steven Maxson
Brian L. McCauley
Kathleen S. McKinley
Kristie L. Mendes
Ismael Mendoza
Ramon Mendoza
Joanna Poeck
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Dominic R. Spencer
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 Justin D. Buck
 Kevin M. Clerkin
 Victor J. Eifealdt
 Timothy J. Fry
 Nancy L. Heflin
 Cristian H. Malaver
 Catherine J. McMIndes
 Megan Meier
 Jaime Eduardo Moreno
 Tony Nguyen
 H. Shawn Smith
 Ryan E. Smith
 Paul J. van Susante

2005

Daniel E. Adams
 Emily C. Allen
 Rees G. Arnim
 Vikram V. Balasubramanian
 DeaZhan K. Begaye
 Jennifer R. Ogawa Berig
 Murray W. Hitzman
 Albert C. Brown
 Dene M. Clair
 Ingrid D. Fedde
 Jeffrey J. Field
 Matthew M. Gallagher
 John A. Harvey
 James R. Hutchison III
 Robert Allen Larson
 Christopher Moerbe
 Eric M. Myrup
 Saxon Paiz
 Lindsay M. Patton
 Nathan J. Pauls
 Philip D. Richard II
 Eugenia M. Rojas
 Jedidiah D. Rust
 Gabriel C. Schwend
 Rajinder Pal Singh
 John William Thompson
 James S. Traub
 Robert T. Wagner
 Laura A. Waldrop
 Christine E. White

2006

Adam J. Acree
 John M. Agee
 Robert S. Bergren
 Andrew M. Brayton
 Daniel L. Cortez
 David M. Dwyer
 Nathan G. Garvey
 Matthew R. Gimlin
 David P. Greaves

Keith E. Hellman
 Kerry O. Jones
 Zachary J. Kimball
 Shawndra M. Lopez
 Anthony J. Makowski IV
 Luis Z. Martinez
 Melanie A. Monarco
 James L. Oehrle
 Terra A. Plute III
 Daniel J. Rabiolo
 Roger F. Reynolds
 Jacob W. Richardson
 Brady M. Romberg
 Stephanie A. Savage
 Chrisman G. Scherf III
 Yvonne E. Schimmel
 Wade W. Simmons
 Megan M. Starr
 Andrew R. Stolzmann
 Pongpob Tantrakul
 Andrew M. Todd
 Dahren L. Wayman

2007

Tammy R. Albrecht
 Heather Ardeel
 Sheena M. Barnes
 Reynaldo W. Cardona
 Aaron N. Clubb
 Jennifer E. Crites
 Jonathan B. Davis
 Kevan C. Dee
 Jesse G. Dickes
 Derek L. Dykstra
 Matthew J. Eyser
 Aaron M. Forehand
 Aaron J. Girard
 Weston Hamilton
 Nicholas S. Henry
 Travis J. Hutchinson
 Alicia Y. Joe
 Kelly N. Kloosterman
 Derek W. Kuntz
 Phillip A. Lawlor
 Matthew D. Lehr
 Brett L. Lewis
 Ian P. Lewis
 Jianliang Lin
 Travis R. Little
 Lia M. Martinez
 Caleb M. Mattoon
 John J. McEncroe
 Alison J. Meininger
 Ryan Miles
 Lorelei E. Mote
 Benjamin A. Ramirez
 Jean M. Romersheuser
 Adam J. Shuler
 Laura J. Slattery
 Mark D. Vallee

Christopher M. Wilkins
 Christine M. Woods-McCormick
 Charles L. Yarbrough

2008

Sean Atkinson
 Bryan A. Babcock
 Michael E.E. Breece
 Brian W. Crawford
 Sean J. Cusick
 Alex Davidson
 Tara L. Davis
 Andrea L. Deiotte
 Gregory D. Foster
 Brian D. Gillingham
 Mitchell R. Harsch
 Dustin J. Haynie
 Jason Hobson
 Corey L. Huck
 Alexander V. Hughson
 Stephen M. Immel
 Nathan W. Kuehl
 Basak Kurtoglu
 Philip C. Loden
 George C. Luzniak Jr.
 Marco A. Murillo
 Erin N. Neil
 Neil T. Ogden
 Justin L. Panter
 Brian M. Petko
 David Z. Pilger
 Renee M. Rainguet
 Munenori Shimada
 Jacob Sievers
 Joseph C. Thornam
 Carly M. Wegher
 Eric S. Wenger
 Cory A. Whitton
 Rachel B. Yee
 Christopher P. Youngmeyer

2009

Julia K. Albertson
 Kenneth J. Anderson
 Luke B. Baron
 Terry F. Bisiar
 Matthew D. Bokan
 Peter N. Brinton
 H. Scott Bromley
 David A. Carey
 Rianna J. Chappell
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- Alan E. Rowe
- Bryce M. Runkel
- Eva I. Salas
- Adam W. Saur
- Anthony L. Siderius
- Natalie Smiley
- Matthew T. Sonnenberg
- Patrick J. Stoever
- Laura R. Tucker
- Richard F. Walker
- David C. Wilson

2010

- Karlyn A. Adams
- Josune M. Armas
- Taylor S. Day
- Jessica C. Grainger
- Gillian M. Hinchliff
- Katherine P. Jolly
- Christopher B. Lee
- Brandon D. Lewis
- Song Liu
- Sarah C. Look
- Blakelee J. Midyett
- Sara P. Post
- Jeffrey R. Reindl
- Pieter C. Rowlette
- Aaron D. Totsch

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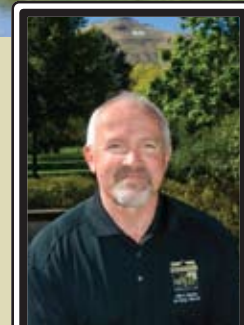
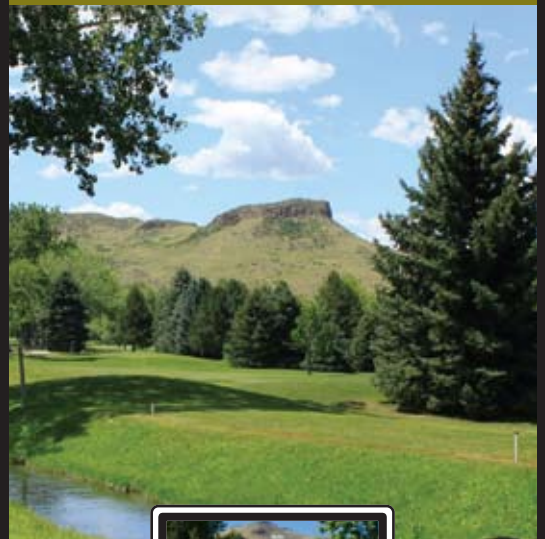


ATTENTION

The Department of Military Science is building a database of past ROTC students and would like to use this database to create a wall of alumni within the ROTC building. Please send a brief e-mail to faguilar@mines.edu with your name, the year you graduated, and/or commissioned, and what military branch you commissioned in. Include anything else you wish, such as how long you served in the military, what you are doing now, etc. And stop in if you are passing through—the ROTC Cadre Office is at 1232 W. Campus Rd., Bldg. 1, Golden.



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Passings

“Like a bird singing in the rain,
Let grateful memories survive in time of sorrow.”

—Robert Louis Stevenson



JOSE “JOE” F. AGAPITO '73 of Grand Junction, Colo., died on November 25, 2009. Born in 1937 in Fundao, Portugal, Joe began his career as a mining engineer in British tin mines. He received his degree in mining engineering from Camborne School of Mines in England, where he was awarded the prestigious associateship of the

Camborne School of Mines. After receiving his degree in 1963, he immigrated to the United States with his wife, Veronica, and family. In 1964, he received a master's degree from the University of Missouri–Rolla. He then enrolled at Mines and pursued a doctorate in mining engineering and rock mechanics. While earning his PhD, he taught undergraduate courses in senior-level ventilation and rock mechanics. Joe then settled in Colorado and worked for Atlantic Richfield Company and Golder Associates. He also served on the board of directors for the American Rock Mechanics Association. After moving with his family to Grand Junction in 1978, he founded an engineering consulting firm, Agapito and Associates, Inc., which is still in operation. Joe is survived by his wife and best friend, Veronica; daughter, Debra; son, David; granddaughter, Liane; and mother, Maria.



JOSEPH “JOE” K. BECKETT, JR. '58 died on May 16, 2010. He was born in Bakersfield, Calif., in 1932 and graduated from Mines with a degree in geological engineering. Joe and his wife, Jane, met in Washington, D.C., in 1959. A long-distance courtship ensued, and they were married on August 26, 1961, in Akron, Ohio. They

moved to San Francisco, where Joe attended Hastings College of the Law, graduating in 1964. He and Donald Roesch opened a law partnership in Redwood City, Calif. Joe later returned to Bakersfield where he spent almost 40 years in the district attorney's office serving as deputy to four successive district attorneys, where he enjoyed his role as courtroom prosecutor. Joe is survived by his wife, Jane; daughter, Linda Doyle; and two grandchildren.



DWIGHT H. BINGHAM, JR. '49 of San Angelo, Texas, died on May 28, 2009. Dwight was born in 1949 in Lake Charles, La. A member of Sigma Phi Epsilon, he graduated from Mines with a degree in geological engineering. On the day of his graduation, he married Louise Marie Berninghausen. Dwight worked as a geological

engineer with Conoco for 29 years, 25 of which were spent in

international petroleum exploration. He worked and lived with his family in Venezuela, Argentina, Qatar, Nigeria, Madagascar, Thailand and Tunisia. Following his international career, Dwight worked as an engineering consultant for LAW Engineering in Marietta, Ga. In 1986, he earned a master's degree in civil engineering from New Mexico State University. He and Louise moved to San Angelo in 1997. Dwight was predeceased by his wife, Louise, and his daughter, Deborah. He is survived by his daughter, Martha Pratt; and son, Jeffrey.

DUANE N. BLOOM '65 of Golden, Colo., died on December 7, 2009. He was born in 1933 in Shafer, Minn., and attended the University of Minnesota, where he earned a degree in geological engineering. In 1956, Duane married the love of his life, Betty. Duane served as a helicopter pilot in the Navy and attained the rank of lieutenant. After completing his tour of duty, Duane attended Mines and received a doctorate in geological engineering. As one of the founders of Earth Sciences Inc., he helped develop the Sherman Mine in Leadville, Colo., and the El Plomo Mine in Colorado's San Luis Valley, and pursued projects in Montana, Canada and California. He co-developed and implemented the Petrex system, a geochemical hydrocarbon prospecting technique. Duane was also active in the Golden community. For 37 years he was a member of Faith Lutheran Church, where he served as president and sang in the choir. He and Betty regularly attended the Central City Opera. Duane also maintained ties to Minnesota, where he developed dairy, soybean, hay and maple syrup operations at the Bloom family farm. He is survived by his wife, Betty; daughter, Beth Bugosh; sons, Daniel, David and Nelson; mother, Muriel; brothers, Byron and William; eight grandchildren; and three great-grandchildren.



WILLIAM “BILL” E. BREMKAMP '49 of Greenwood Village, Colo., died on December 8, 2009.

Bill was born in 1922 in Brighton, Colo. He married Josephine Rombeck on January 29, 1949, in Denver. He graduated from Mines with a degree in geological engineering, before beginning a lifelong career in the oil and gas business. However, his other career, that of raising his family, always remained his foremost priority. Bill is survived by his wife, Josephine; sons, Stephen '81 and James; daughters, Susan Lang, Carole Shank, Roxanne Sienkiewicz and Karen Carnahan; sister, Elizabeth Hattendorf; 13 grandchildren; and seven great-grandchildren.



FREDERICK “FRED” CARPENTER of Rockford, Ill., died on February 2, 2009. Fred was born in 1913. He married Velma Hicks on June 18, 1935. During his career, Fred was a professor of mathematics at Mines and Colorado State University. He was a member of the

Mathematical Association of America since 1944 and was an avid hunter. Fred was predeceased by his wife, Velma, and his son, Gary. He is survived by his son, Bill; sisters, Margaret Mortimer and Helen Rosenthal; two grandchildren; and three great-grandchildren.



A. BERNARD “BERNIE” COADY '54 died on August 29, 2010. Bernie was born in 1933 and raised in Cardston, Alberta. He joined the Sigma Nu fraternity at Mines and graduated with a degree in petroleum refining engineering. In 1957 he married Theresa Violini, with whom he shared 53 years. Bernie's career began in Calgary as a

process engineer with Shell Canada Ltd.; he later transferred to Petrofina Canada. In 1966, Bernie founded Delta Projects Ltd., the first Calgary-headquartered company to provide engineering, procurement and construction services to the hydrocarbon processing industry in western Canada. When his company expanded and was renamed Delta Catalytic Corporation, Bernie served as chairman and CEO for 10 years. He was recognized by the Association of Professional Engineers, Geologists, and Geophysicists of Alberta with the Centennial Award—the highest honor awarded by that group—and the Pinnacle Award, for outstanding business leadership in Calgary. Mines awarded him a Distinguished Achievement Medal in 1993. He was also a member of Mines Century Society and President's Council, and was the director of the Colorado School of Mines Alumni Association Board of Directors. He retired in 1997 after 43 years developing the natural gas, petrochemical and heavy oil recovery industries in Canada. In his retirement, he served on the board of a number of organizations and companies, offering his expertise and wisdom. In 2010, he received the Outstanding Achievement Award from the Gas Processing Association of Canada. Bernie is survived by his wife, Theresa; sons, Michael and Gregory; daughter, Danette Coady; sisters, Catherine Crighton, Doris Durrell and Joan Irwin; and 10 grandchildren.



ROBERT “BOB” ELLIOT '69 of Moon, Va., died on January 30, 2010. Born in 1946, Bob graduated from Mines with a degree in geophysical engineering. Bob completed naval officer training in Pensacola, Fla., and served as a naval aviator for 21 years. After retiring from the Navy as a lieutenant commander, Bob resided in Stafford,

Va., with his family while working as a senior engineer for 17 years in Navy contracting. An avid pilot, Bob continued to fly after his days in the Navy. He flew to work and back in his private plane and took occasional jaunts to visit friends. His love of the water brought him to Stutts Creek in Moon, Va., in April 2006, where he enjoyed sailing, windsurfing and just appreciating the beauty of the bay. Bob is survived by his wife of 30 years, Debbie; sons, Chris, Matt and Ryan; brother, Bill; sister, Pam; and one grandson.



GEORGE E. GEBHARDT '40 of Coos Bay, Ore., died on January 24, 2010. Born in 1915, George was raised in Coos Bay and attended North Bend High School, where he was class president, won the extemporaneous speaking contest and was selected outstanding senior boy. After graduating in 1933, George attended Mines, where he earned a

degree in geological engineering. On February 2, 1943, he married Kathleen Claire Crowley in Fort Belvoir, Va. George served in the Army during World War II; at the end of the war, he was serving as captain of an engineering battalion in France. After the war, he returned to work in the oil fields of Texas until 1947, when he was offered the chance to return to Coos Bay and operate a restaurant. By 1951, he was the sole owner of the Top Hat Drive-In. He and his wife ran this popular North Bend business for more than 17 years. From 1965 to 1980, he worked in real estate, and in 1985, he founded the successful Gebhardt Mining Company. For more than 45 years, George was an active member of the Coos Bay Lions Club and earned the highest awards from the organization. He was engaged in numerous community projects with local schools and governments. George is survived by his wife, Kay; daughter, Ann Leadon; sons, Charles and George, Jr.; six grandchildren; and two great-grandchildren.



PERRY K. “P.K.” HURLBUT '40 of Midland, Texas, died on February 7, 2010. P.K. was born in 1914 in Joplin, Mo. He graduated from Mines with a degree in geological engineering. He began his career working as a geologist in the mercury mines in Terlingua, Texas, and joined the Army after the attack on Pearl Harbor. He served five

years in France and Germany with the Army Corps of Engineers and attained the rank of captain. After the war, P.K. met Pauline Katherine Walz, and they married on November 17, 1946. The couple lived in Hanover, Ill., and later moved to Miami, Okla., where P.K. worked as a geologist in several mines. While employed at Cities Service Oil Co., P.K. worked at various sites in the United States and Canada. He was the oil and gas supervisor of the Navajo Tribe in Gallup, N.M., and worked in the mining, oil and gas division of Phelps Dodge in Silver City, N.M. When he retired in 1981, P.K. and Pauline returned to Midland, Texas. He was a member of the Society of Economic Geologists. He also enjoyed working with the Boy Scouts of America and made sure his three sons attained the rank of Eagle Scout. He was a volunteer and board director of Cal Farley's Boys Ranch. Pauline preceded him in death in 1991. He is survived by sons, Jack, Douglas and William; daughter, Alisa Bluth; and six grandchildren.



WILLIAM “BILL” N. LAWLESS '59 of Westerville, Ohio, died on December 25, 2009. Bill was born in Denver in 1936. He graduated from Mines with a degree in metallurgical engineering and was a member of the Alpha Tau Omega fraternity. In 1965, he received his PhD in physics from Rensselaer Polytechnic

Institute in Troy, N.Y. Throughout his career as a physicist, Bill received many patents and awards. He was a member of IEEE and the American Physical Society, and was co-owner of Ceramphysics with his good friend and partner, Dr. Fred Clark. Bill is survived by his loving wife of 31 years, Nancy; daughters, Laurie Lawless, Denise Lawless and Therese Cooke; stepchildren, Pamela Bury and Gregory Button; and 10 grandchildren.



DENT L. LAY '35 of Boulder City, Nev., died on February 16, 2010. Dent was born in Rocky Ford, Colo., in 1912. He graduated from Mines with a degree in metallurgical engineering. At Mines, Dent was active in sports, earning four letters in basketball and three in football. He was a member of the Sigma Phi Epsilon and Theta Tau fraternities, and the National Society of Scabbard & Blade. In 1935, he was honored by his classmates as that year's "Typical Miner." Dent was called into service in April 1941 as a first lieutenant with the Army Corp of Engineers. Later he was assigned to the 813th Engineer Aviation, where he attained the rank of lieutenant colonel. After the war, Dent was transferred to the Air Force and sent back to college at Ohio State University, where he obtained a master's degree in physics in 1951. After a short tour at Wright-Patterson Air Force Base and a year attending the Air War College, Dent was assigned to the Armed Forces Special Weapons Project in charge of nuclear weapon effects and received the Legion of Merit for his work. Dent was later chosen as one of two military officers to help start a Department of Defense research program designed in response to the USSR launch of Sputnik. In 1961, he retired from the Air Force with the rank of colonel. For the next 10 years, he worked primarily with Lockheed Aircraft Corp. Before he retired, Dent served as executive director of the San Fernando Valley Child Guidance Clinic, where he worked at the request of a friend to help with the clinic's financial problems. Dent is survived by his wife, Peggy.



ROBERT W. "BOB" MACCANNON '51 of Pueblo, Colo., died on August 17, 2010. Bob was born in 1929 in Denver and graduated from Mines with a degree in metallurgical engineering. He joined the Sigma Phi Epsilon fraternity and the ROTC program at Mines. In 1954, he received a second degree in mining engineering. During the Korean War, Bob served in the Army as a member of the 82nd Airborne Division. After his service, he worked in Colorado Fuel and Iron Corporation's mining department, primarily involved in iron ore production. He worked at the Sunrise, Wyo., and Cedar City, Utah, operations until his transfer to the main office in Pueblo in 1978. He retired in 1986. Bob was past president of the Wyoming Mining Association, a member of the American Institute of Mining Engineering, and authored the book, *Sunrise: A Chronology of a Wyoming Mine*. He was a Colorado School of Mines Alumni Association section coordinator, a lifetime member of the National Ski Patrol and a volunteer for the Bessemer Historical Society. Bob is survived by his wife of 55 years, Doris; daughter, Diane Joyce; son, William; and three grandchildren.



E. JAY MAYHEW '41 died on February 18, 2010. Jay was born in 1916 and grew up on his family's farm near Trusdale, Kan. On August 3, 1938, shortly after starting his career at Mines, he and Helen M. Moore eloped. After graduating from Mines with a degree in geological engineering, he immediately went to work as the chief geologist

for Great Lakes Carbon Company in Moab, Utah. After deciding he wanted to spend less time on the road and more time at home, Jay began working for himself. In total he launched five companies, which ranged from drilling mud services to clay mineral exploration, including Utah Mud Company in Albuquerque. He discovered the potash of the Paradox Basin, a number of uranium deposits, and several deposits of rare clays in Nevada. Jay and his family eventually moved back to Colorado, where he began working for the Colorado School of Mines Research Foundation. He received three patents for drilling fluids and was a member of several professional organizations, including the American Institute of Mining, Metallurgical, and Petroleum Engineers; and the American Association of Petroleum Geologists. An active community member, Jay served a term in the Utah Legislature, and volunteered frequently for various Cub Scouts, Boy Scouts and high school activities. He was also named an Honorary Member of the Colorado School of Mines Alumni Association in 2007 for his many years of support for the organization. Jay and his wife enjoyed travelling, and visited South America, Asia and Australia. Helen predeceased Jay after 65 years of marriage. He is survived by his sons, John '67, '69, Robert and Allen; eight grandchildren; and nine great-grandchildren.



JERRY R. MCLEOD '57 of Carmel, Calif., died on March 1, 2010. Jerry was born in 1935 and was raised in Shreveport, La., where he graduated from Byrd High School in 1953. While at Mines he was an all-conference guard on Mines' football team, the editor of *The Oredigger* in his senior year, and a member of the Alpha Tau Omega fraternity. He was selected to *Who's Who in American Universities and Colleges*, and graduated with a degree in petroleum engineering. In August 1957, he married Nancy Ackenhausen and began working for Cities Oil Service Company as a production engineer. Jerry later attended the Harvard School of Business Administration and received his MBA in 1965. He then returned to Cities Oil Service in Tulsa, Okla., and became vice president of production in the Western region. He was later a vice president of Tenneco in Houston and executive vice president of Pacific Gas and Electric in San Francisco. Jerry married Lynn Williams in 1975. He is survived by his wife, Lynn; sons, Mark and Steven; brother, Harry '53; sister, Dianne McLeod; and five grandchildren.



BOBBY G. NEWTON '52 of Hinsdale, Ill., died on May 16, 2010. He was born in 1928 in Newton County, Okla. His family later moved to Nickerson, Kan., where he graduated from Reno Community High School in 1946. Bobby was a member of Tau Beta Pi and graduated from Mines with a degree in geological engineering. On September 29, 1951, he married high school classmate Fern Arlene Moorman in Nickerson. Bobby went to work for Amoco, serving in the United States, Canada and Egypt. He retired in 1986 as vice president of Amoco Exploration International. During his career, he was involved in the discovery of the Sherwood Unit in the

Powder River Basin, led Amoco's entry into the deepwater Gulf of Mexico and offshore Nile Delta, and served as a director of the Earth Science Research Institute. Fern predeceased him in 2008. Bobby is survived by daughters, Kayla Rocereta and Tara Striemer; son, Robert; five grandchildren; and two great-grandchildren.



JAMES E. "JIM" QUINN '48 of Denver, Colo., died on March 4, 2010. Born in 1925, Jim graduated from Regis High School in 1943 and entered Mines three days later. A member of Sigma Alpha Epsilon and the varsity basketball team, Jim graduated from Mines with a degree in mining engineering. As a student he worked numerous

jobs, including several semesters with Climax Molybdenum Co., which helped to prepare him for his first job after graduation—selling a large amount of equipment to Climax Molybdenum. From 1948 to 1974, Jim worked for Denver Equipment Co. (DECO) selling mineral processing equipment and serving as vice president worldwide for DECO-Joy sales. In 1974, Jim joined Hazen Research as vice president of marketing. In 1977, Hazen-Quinn Process Equipment Co. was formed as a wholly owned subsidiary of HRI, and Jim became chairman of the board. In 1993, he purchased 100 percent of Hazen-Quinn and renamed it Quinn Processing Equipment Co. Jim enjoyed spending time at his property in Grand Lake, Colo., where he took many sunset cruises. He is survived by his wife of 61 years, Irene; sons, James, Edward, Richard and Robert; daughters, Melinda Blanchard, Deborah Pesusich, Rebecca Bolders and Marilyn Miller; 33 grandchildren; and seven great-grandchildren.



PAUL M. "MIKE" RIVERA '77 of Azusa, Calif., died on July 10, 2009. Mike was born in Denver, Colo., in 1954. He graduated from North High School in 1972 and later graduated from Mines with a degree in geological engineering. He loved his work and traveled to Mexico, Algeria and Venezuela. Mike's career in the oil and

gas industry began with Western Slope Gas Co. where he was a supervisor in reservoir engineering. Mike most recently worked for Canadian Triton International as a supervisor of production engineering in its Venezuela operations. He is survived by his mother, Sheila; sister, Cheri Bradell; and brother, Ray.



RICHARD LEE "DICK" SCHMITTEL '67 of Nevada City, Calif., died on July 30, 2009. He was born in 1943 in Salida, Colo. Dick received a five-year National Merit Educational Scholarship, which he used to attend Mines. He joined the Sigma Phi Epsilon fraternity and graduated with a degree in mining engineering. Dick was fluent in Greek

and Spanish. He was listed in *Who's Who in America*, and was a member of the Sigma Phi Epsilon Alumni Association and the Colorado School of Mines President's Council. Beyond family, his great joys were flying his Cessna, scuba diving, baseball, literature

and community service. He was also extremely passionate about his patent: a method and apparatus for separating fine grade particles. Dick is survived by his wife of 30 years, Kathleen; sons, Dane and Ryan; and sister, Kenny.



LAWRENCE C. "LARRY" TISDELL '54 of Port O'Conner, Texas, died on February 18, 2010. Born in 1932, Larry was raised in Brighton, Colo., where he attended public school and received a scholarship to Mines. He was a member of the Beta Theta Pi fraternity and earned a degree in petroleum refining engineering. Shortly after graduation, he was drafted and served in the Korean War. During his service, Larry worked on rocket development in Huntsville, Ala. He finished his tour of duty with a G-13 rating and was then employed by Shell Chemical Co. in Pittsburg, Calif. In 1959, while working on a master's degree at the University of California at Berkeley, Larry met and married Elizabeth Noble Cathcart. The couple returned to Colorado in 1962, where they resided for more than 40 years. During most of that time, Larry and his family lived in the foothills above Golden, while Larry worked at the Colorado School of Mines Research Institute until retiring in 1983. Larry shared his love of hiking, backpacking, motorcycling, kayaking and fly fishing with family and friends. He also became a partner of the Flying X Ranch in Wyoming and purchased a winter home in Port O'Conner, Texas. Larry is survived by his former wife, Elizabeth C. Tisdell, of Santa Barbara, Calif.; daughters, Anne Beecroft and Elizabeth Holmstead; son, Curtis; and eight grandchildren.



RICHARD M. T. YOUNG '38 of Palo Alto, Calif., died on October 26, 2009. Richard was born in Honolulu, Hawaii, in 1916. He won a scholarship to the Punahou School in Honolulu and later earned a degree in metallurgical engineering from Mines. His first job was the construction of a steel mill in Anning, Yunnan Province, China,

which is still in operation. Richard traveled through Japanese-occupied territory in China in the late 1930s, but he returned to the United States before the country entered World War II. He joined the Army and became Gen. Joseph Stilwell's aide-de-camp. He participated in the Allies' 300-mile march out of Burma in 1942 and their later recapture. After the war, Richard worked as an engineer and executive with the Department of Defense, Lockheed Martin Corporation and the U.S. Postal Service. He retired as a full colonel in the Army Reserve. He returned to China in the late 1970s and oversaw the construction of the Great Wall Hotel. Richard was a resident of Beijing through 1992, when he returned to Palo Alto. His first wife and the mother of his children, Vivien Woo Young, died in 1968. He is survived by his second wife, Helen Praeger Young; daughters, Vicki Young and Virginia Young; son, Peter; stepchildren, Elena Diana, Stephen Keller, Jennifer Keller Dandy and Christopher Keller; sisters, Bernice Chung and Dorothy Ako; three grandchildren; and five step grandchildren.

Also In Memoriam

John R. Blomberg '56.....August 12, 2008
Ralph L. Boyers '50.....December 28, 1996
Earl D. Bristow '37.....November 1968
Edgar H. Clayton '36.....May 18, 1992
Ralph G. Finlay '39.....October 10, 1989
Alan E. Hall '39.....June 1988
John S. Heggie III '67.....June 3, 2002


Robert G. Hill '39.....January 1, 1973
Joseph R. Hogan '67.....October 21, 1995
Thomas H. Hoover '59.....August 29, 2009
David A. Kellogg '49.....January 1989
Harold L. Kelley '36, '38.....May 7, 2010
I. Milton LeBaron '41.....June 25, 1997
Henry G. McCleary '48..November 29, 2008

William L. Payne, Jr. '50..December 13, 2009
Robert L. Rock '51.....October 1977
Joseph J. Sanna '41.....September 6, 1993
Donald E. Wilson '52.....July 19, 2009
Arthur N. Winsor '40.....December 1978
Robert E. Zimmer '49.....October 20, 2008
William Zohn '35.....September 4, 2009

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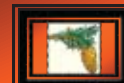


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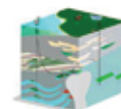
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