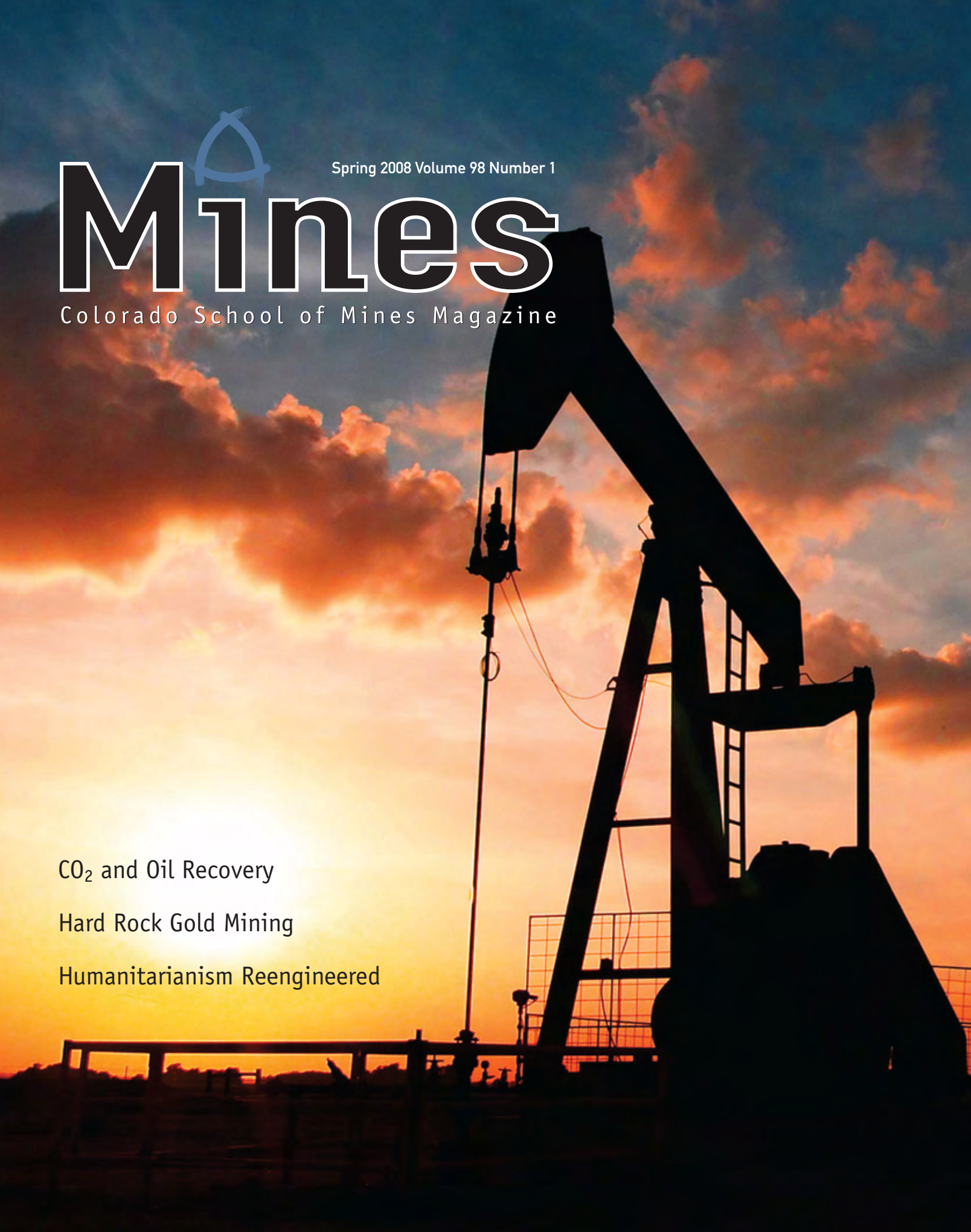
Spring 2008 Volume 98 Number 1

Mines

Colorado School of Mines Magazine



CO_2 and Oil Recovery

Hard Rock Gold Mining

Humanitarianism Reengineered

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Seven Mines alumni work Colorado's only active underground gold mine, which is situated only a stone's throw from one of the first Rocky Mountain gold strikes.

Cover photo: Shutterstock

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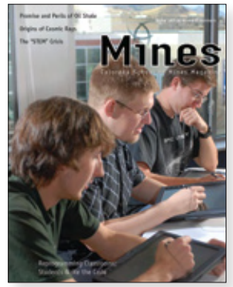
Readership Survey

An online readership survey was conducted prior to the distribution of the Winter 07/08 issue. It was sent by email to about 9,000 alumni, of whom 1,750 responded—an excellent response rate in the world of online surveys.

A hearty thank you goes out to all who participated. We received several comments along the lines of Warren Hildebrand's '59: "I felt that your Dec 2007 survey was well-designed and courteously brief." His second point was particularly good to hear, as we worked hard on brevity and will continue to do so with future surveys. Highlights of the results follow, although a more comprehensive report will be posted on the *Mines* magazine website http://www.mines.edu/magazine.

Results Summary

The magazine appears to be quite well-read. Over 73% of respondents report that they read "some of it," and 23% report they read "all of it." Not including feature stories, the most popular section of the magazine is Fast Forward/Class Notes (no surprise). Runners up (in order of popularity) were Inside Mines, The Last Word, New Frontiers and The Network. To the statement, "Feature stories are well-written," 47% of respondents said they "strongly agree" and 50% "somewhat agree." And to the statement, "Feature stories cover subjects that interest me," 24% "strongly agree" and 73% "somewhat agree." One of the most positive responses in the survey concerned the new look of the magazine—in all categories respondents were pleased with recent changes in design. In a question aimed at identifying which subjects were of the greatest interest to readers, the top three were, "Mines' accomplishments/ successes," "interesting or prominent alumni" and "alternative energy research." A total of 128 respondents submitted subjects they would like *Mines* to cover—a sampling is provided below. In addition to providing some valuable pointers for the future, the survey also raised awareness about the magazine website. The month following the survey was its busiest to date. On that subject, we are grateful to those who pointed out errors in the earliest version of the website. We apologize for the oversight, but thanks to your vigilance, corrections were made promptly.



Responses to: "Please detail anything else you would be interested in reading about."

- New buildings, architectural improvements around the campus. I liked the article on the new recreation center.
- Water (conservation, recovery, treatment, etc.) and nanotechnology
- Research that Mines graduates and alumni are currently working on
- History of the school: especially stories not well known. Stories of significant engineering and scientific breakthroughs that have come from CSM.
- Statistics on placement rates after graduation, average starting salaries
- Environmental issues
- Hydrogeological research
- Mines Geology Museum
- Articles written by alumni on subjects other than those taught at CSM... An intelligently selected and well-crafted story by an alumnus can be just as interesting as one about an alumnus
- Traditional, core strengths of the university in oil, gas and mining
- Alternative energy issues
- A "Where are they now?" section on past alumni who may have not remained in their CSM study field.
- Very interested in hearing about theories which might alleviate our country's dependence on foreign oil imports
- The current curriculum
- More articles on the economic benefits of mining (and related natural resources development in general) to underdeveloped and developing countries
- Stories about female students and their accomplishments
- Interesting career paths or hobbies of alumni
- Athletes who try to go pro
- Alumni working and/or living in different parts of the world
- Startup companies of alumni
- Petroleum engineering related stories
- Nanotechnology and fabrication of energy-related products
- Alumni who are no longer working in the minerals industry—some of us found great success in other career areas.
- Current academic news and info on the students, demographics, program info, etc.
- I would like to see a list of published papers from graduate students/profs
- I am very interested in sustainbility and want to see more of that. More on green building and the environment.
- I wish there were more articles about what alumni are doing to support the school. Also, more on career opportunities on and off campus.
- Current science topics such as the science behind global warming
- What my classmates are up to in addition their careers
- Stories about geoscience activities in countries receiving little coverage in mass media, such as Russia, India and China
- Professor profiles

Responses to: "Please list any stories that particularly interested you."

- Messengers from Distant Galaxies, Oil from Stone
- Mines students inventing how to use tablet laptops in teaching. I like to hear stories of how Mines students/graduates have applied their knowledge and in turn have innovated new products or technologies.
- Iraq's nuclear program
- Oil Shale
- Last Word is awesome! Please keep that! I love it!
- Article on nuclear energy
- Environmental protection activities
- I loved the one on the closing of Foss. I was so sad to hear about that and loved all the readers' memories.
- Fuel cell research
- Bioplastics, biofuels
- Dave Coolbaugh's article on Burma
- The Last Word article discussing cracking concrete on the TRex Project
- Renewable Energy, Energy Transmission, Oil Shale, Alternative Fuels, Biomass
- The story on the "EPICS" students in Hawaii... the Mines team probably had the better answer with lava tubes.
- The one on the brothers that wrote software for telescopes

Editor's Note: A handful of comments pointed out that we did not detail the affiliations of the author of the oil shale article in the Winter issue, "Oil From Stone." The author, Paul Roberts, is a freelance writer and researcher with no professional affiliations to the energy industry. Had he any, they would certainly have been mentioned.

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www.mines.edu
www.csmaa.mines.edu/alumni

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Mines is published quarterly by the Colorado School of Mines and the CSM Alumni Association for alumni and friends of the School. *Mines* magazine is a critical communication serving the Colorado School of Mines community. Its mission is to keep readers informed about the School, to further the goals of the School and the Alumni Association, and to foster connectedness.

Comments and suggestions are welcome. Contact us by writing to *Mines* Magazine, P.O. Box 1410, Golden, CO 80402; or call 303-273-3294 or 800-446-9488, ext. 3294 between 8 a.m. and 5 p.m. M-F, MST; or email magazine@mines.edu.

Dear Readers,

Warm weather has pushed winter aside for many of you around the country, but at Colorado School of Mines it is coming in fits and starts—one day it snows, the next it is in the 70s. Some things don't change.

The same cannot be said of *Mines* magazine. As you may have read in Inbox, we received lots of feedback from the readership survey, and this issue reflects our response to some of it. Several respondents said they wanted to read about outstanding students. As a result, two very active members of the student body—Emily Milian and Zach Aman—are profiled on page 14. Their stories are impressive and a source of inspiration and pride. Several respondents expressed an interest in reading about current faculty. We've provided three engaging profiles of faculty on pages 12-13 that are reprinted from the School's research publication, *Energy and the Earth*. Researchers profiled include Eilene Poetter, Tissa Illangasekare and David Matlock. And for the many who asked us to write about alumni in non-traditional careers, don't miss the profile of Jose Moreno '96, whose office window in the American Embassy Moscow looks out at the Russian White House.

The feature stories in this issue cover a broad spectrum. "Seismic Solutions," by Nicole Branan, reports on how the Reservoir Characterization Project tracks carbon dioxide as it migrates through deep underground oil reservoirs—work that is of interest to both energy companies wishing to enhance oil recovery operations, and environmental organizations interested in sequestering carbon dioxide. "Hard Rock Gold Mining," by Brendan Harrington and myself, tells the story of six alumni working in the only underground hard rock gold mine that remains active in Colorado. It's not just the "who," but the "how" and "where" that make this an engaging tale. And "Humanitarianism Reengineered," by Doug McPherson, details the work of a popular engineering program that is making a difference for students at Mines and for communities in developing countries around the world.

In Network, you can read about the Alumni Association's growing Mentoring Program, regional receptions and a little E-Days history. In place of Last Word, we have Parting Shots: two pictures of Golden, both taken from South Table Mountain, one around 1908, the other in 2008. We didn't receive a Last Word submission. If you have considered writing a Last Word essay, please get in touch. The survey feedback shows this is one of the most popular elements in the magazine, but it requires involvement by readers.

Lastly, everyone here at the Alumni Association is looking forward to Reunion 2008. You'll find some details on page 37, but a much more comprehensive program is found at www.minesonline.net. There you can complete your registration and sign up for special events. There's a lively weekend planned and we hope to see you there!

Best wishes,

Nick Sutcliffe
Editor and Director of Communications, CSMAA

Campus News

$2.5 Million Challenge Grant Kick-Starts K-5 Education Initiative

Terrie L. Zeller/Shutterstock

Mines is launching an exciting education outreach initiative with a $2.5 million challenge grant from Stephen D. Bechtel, Jr., retired chairman and director of the worldwide engineering and construction firm, Bechtel Group, Inc. The Bechtel K-5 Educational Excellence Initiative will address the problem of why large numbers of children lose interest in math and science during elementary school. By sponsoring programs that have been shown to promote interest and enhance teaching in these areas, the grant is expected to make a substantial impact in area schools. The Colorado School of Mines Foundation is working to raise $2.5 million in matching funds over the five-year grant period, which began in January.

"Our premise is that if K-12 students learn about exciting applications of science, mathematics and engineering, they are more likely to enter the related fields. They need to tackle real experiments and not just read about them in a book," said Barb Moskal, associate professor of mathematical and computer sciences at Mines and director of the Center for the Assessment of Science, Technology, Engineering and Mathematics.

Stephen D. Bechtel, Jr.

Through the Bechtel Initiative, Mines faculty are helping educators improve science and math instruction in kindergarten through fifth grade in Adams County District 50 and Aurora Public Schools. Moskal expects the program to have a real impact, particularly among females, minorities and other groups who have been underrepresented in these critical fields. And, the program will help inform similar initiatives at other institutions.

"Engaging elementary students in science and math is a growing component of Mines' outreach mission," said President Bill Scoggins. "This initiative will help spark student interest and help teachers create effective strategies for schools nationwide."

For Bechtel, an early focus on science and math education is critical to developing a strong, vital society. In an address at Mines in 2007, he discussed challenges to U.S. technical competitiveness, asking graduates to serve as role models for young people. "Our economic leadership, our standard of living, our way of life, our innovative edge depend upon your help in ensuring that there will be many more boys and girls following in your footsteps here at Mines and in other engineering and science programs across this country," he said.

For more information on the Bechtel Group, visit www.bechtel.com.

Emergency Alert System Launched

Campus officials recently implemented Mines Emergency Alerts—a new voice and text messaging system that will notify the campus community in the event of a declared emergency. The new alert will work in conjunction with Mines' current campus broadcast voicemail and e-mail systems.

When an emergency situation is identified, the text and cell phone voice messaging system can be accessed by authorized officials through a web-based launch site. While on the site, the user can quickly send an emergency notification to all campus subscribers. With the vast majority of people carrying cell phones, the system will quickly reach across campus in the event of an emergency.

Over the past year, Keith Turney, Mines chief of police, has been involved with reviewing procedures and plans for potential campus emergency situations. "Extensive work has been done on the School's Emergency Operations Plan, including campus emergency declaration, notifications and incident command setup," he wrote in a recent e-mail to the campus community.

When asked to pose for this photograph, these four students chosen at random were all able to produce cell phones capable of receiving a broadcast text message sent by the Emergency Alert System.

Currently the residence halls and housing system operate on 24-hour Blastercard access. Turney said this will remain in place indefinitely. Additionally, school officials are developing in-service training for faculty and staff on subjects such as classroom management and the identification of troubled students and staff.

For more information on Mines Emergency Alerts, go to http://www.mines.edu/mea/.

Campus Newspaper Extends Reach

Just as the newspaper industry as a whole is undergoing change, Mines' student publication, *The Oredigger*, has recently refocused its mission and initiated a redesign.

The current newspaper staff is taking news-gathering and publication in a new direction, and editor-in-chief, Zach Aman, recalled how "Square one of the shift concerned structure and responsibility."

"Our former system drew on the standard 'one-editor-per-section' approach that most major newspapers employ," said Aman. "We quickly realized that being students at an engineering institution called for a creative approach to news and, subsequently, a creative take on organizational structure."

Instead of having a hierarchical management structure, the team focused on creating concentric circles of responsibility. The paper's editorial board supervises the vision, direction, budget, personnel and content programming for the organization. In addition, content management groups focus on a team approach to story assignments and photography.

"Each team is designed to be cross-functional," said Sara Post, copy editor. "Each role facilitates a different function, but communication must flow between them at all times."

Aman and the staff's hard work is paying off. According to Aman, *The Oredigger*'s reach has increased by approximately 600 percent over the past year. And Hilary Brown, the newspaper's managing editor, said *The Oredigger* staff has doubled the production schedule, offering updated print and online editions on a weekly basis.

The campus community, along with the general public, has taken notice.

"We don't have a journalism school here at Mines, but we certainly have a committed group of students who are producing a quality publication—both in print and online. People look forward to each issue of *The Oredigger*, which they know will be full of great information and photos, thought-provoking and sometimes laugh-out-loud funny." Recently, the CSMAA has sent links to its online version to alumni and the feedback is positive.

Additionally, *The Oredigger* staff has developed and plans to maintain a five-year strategic plan. The goal is to centralize and direct the staff's focus and demonstrate commitment to its organizational partners.

The current plan runs through 2011 and outlines leadership models, methods to ensure continuity and quality feedback channels. For more details, visit *The Oredigger*'s updated website at www.oredigger.net.

New VP for Advancement Named

Molly Williams has been named Mines' vice president for university advancement. Williams comes to Mines from Northern Arizona University, where she served as vice president for university advancement and president of the NAU Foundation. She previously served as associate vice president for institutional advancement and campaign director at the University of Wyoming and held positions in development at the Denver Botanic Gardens and the University of Denver. Between 1986 and 1993, she served Mines as director of major gifts and associate director of corporate and foundation relations.

Peter Han, outgoing vice president for university advancement, will continue serving Mines as senior advisor to the president and chief of staff. Under his leadership in university advancement, the School completed its most ambitious fundraising campaign to date, which brought in a record $135 million.

Career Day Beats All Records

"You have taken all the fun out of going to other schools' career days! There is just no comparison," exclaims Gene Kaylan of Boecore. "We were totally impressed with the intellectual quality and professionalism of your students—you all should be very proud!"

Post-event feedback such as this poured into the Career Center after the staff wrapped up the record breaking Spring 2008 Career Day. It was the largest Spring Career Day in Mines history, with 176 companies bringing 540 recruiters to campus. One third of these recruiters were alumni, proud of the opportunity to recruit Mines students for their companies. And the Career Center had a waitlist of over 30 employers hoping for the same opportunity, despite holding the event in the spacious new Student Recreation Center.

The event elicited high praise from the National Renewable Energy Laboratory based in Golden: "This is the most well run and professional career day I have attended at any college. The staff is superb, and the quality of students very high." Similarly, the Northrop Grumman recruiting team wrote, "[Mines] has the best technical students in the region. Our managers are always impressed with the caliber of interns and college hires that we have on staff."

In addition to technical competence, several companies reported they found Mines students particularly well rounded. Olsson Associates wrote, "Not only are the students top-notch technically, but they are also well prepared in important business aspects such as communication, relationship-building and teamwork. We will continually recruit talented students from Colorado School of Mines."

And students seem to be aware that recruiters are looking for more than good grades. "I've heard many companies say they come to Mines because they are looking for people and not just engineers," states Carly Wegher, a senior majoring in civil engineering. "They really appreciate people skills and a positive personality. I talked with nine different companies and feel confident about hearing back from them."

Already the Career Center is preparing for the Fall 2008 Career Day, which is likely to be an encore performance. It is scheduled on Tuesday, September 9 at the Student Recreation Center.

MLK Events Draw Large Crowds

Patrick Beseda, *The Oredigger*

Members of the Mines community celebrate Martin Luther King Jr.'s birthday at the Student Center.

The 2008 Martin Luther King Jr. Day celebration at Mines broke records.

The events, sponsored by the President's Diversity Committee, included a faculty and staff breakfast featuring thoughts on the occasion by President Bill Scoggins and other members of the campus community.

"I am particularly struck by the relevance of Dr. King's message in today's increasingly globalized, international society and of the applicability of his message to us at Mines. It is fitting that we take this day to remember this great American and his fight for freedom, equality and dignity for all races and peoples," Scoggins said.

Three people were honored for their efforts to promote tolerance and diversity at Mines: Leslie Olsen, director of International Student & Scholar Services; Roz Yocom, Arthur Lakes Library technician; and Scott Cowley, associate chemistry professor.

The evening program included food, student poetry and music by Reverb and the Verse, a progressive hip-hop group that includes Jahi Simbai, director of graduate recruiting and admissions. The event was attended by approximately 400 people. Historically the event has attracted less than 100 attendees.

In Brief...

Physics Professor **Tom Furtak** has been appointed head of the Department of Physics. This appointment comes after Professor **Jim McNeil** stepped down from the position in late 2007. McNeil held the post since 2000, leading the department through a period of robust expansion and growth. Furtak and McNeil both joined the Mines faculty in 1986.

John Poate, vice president of research and technology transfer, has been selected for recognition by the Materials Research Society as an MRS fellow. The inaugural class of fellows were recognized in March at the 2008 MRS spring meeting in San Francisco. The title honors MRS members for distinguished research accomplishments and outstanding contributions to the advancement of materials research worldwide.

Tracy Camp, mathematical and computer sciences professor, has been awarded the prestigious Mines Board of Trustees Outstanding Faculty Award. Camp was chosen for her creative achievements; contributing to students' classroom learning; significant achievements outside the classroom, such as mentoring; actively fostering a learning community; and the development and implementation of practices that align with the current trends in higher education. Camp is internationally known for her efforts to support women in computer science, and her work has been reported in newspaper and magazine articles, including the *N.Y. Times*, the *Chicago Tribune, USA Today* and *Scientific American*.

Wendy Harrison, geology and geological engineering professor, has been named associate provost at Mines. Harrison's husband, Richard F. Wendlandt, is a professor in the Geology and Geological Engineering Department and her son, Piers Wendlandt, graduated from Mines with a degree in mining engineering in 2005. Her daughter, Alison Wendlandt, is a PhD candidate at Yale in organic chemistry. Harrison has a bachelor's and doctorate degree in geology from the University of Manchester.

Vicki J. Cowart of Denver and **James R. Spaanstra** of Lakewood have joined the Mines Board of Trustees and will serve terms effective from the beginning of this year through December 31, 2011. Cowart, who received a master's degree in geophysics from Mines in 1977, serves as president and chief executive officer of Planned Parenthood of the Rocky Mountains. Previously she was state geologist for Colorado and director of the Colorado Geological Survey for 10 years. Prior to that time, she spent 19 years working in the oil and gas industry. Spaanstra is a partner at the Denver law firm of Faegre & Benson, one of the largest and most diverse environmental practices in the Rocky Mountain region.

Eul-Soo Pang, professor in the Division of Liberal Arts and International Studies, has been appointed Visiting Professorial Fellow for 2008 at the Institute of Southeast Asian Studies, a government-funded think tank in Singapore. He will work on a book-length project titled "Embedding Security into Free Trade: The Case of the United States-Singapore Free Trade Agreement." Only 13 other scholars have held this position in the institute's 40-year history.

Tina Gianquitto, assistant professor in the Division of Liberal Arts and International Studies, has been awarded a one-year National Endowment for the Humanities (NEH) Fellowship. Gianquitto's fellowship—one of 94 granted out of 1,200 applications—will allow her to begin research for a new project, "Dear Mr. Darwin: Women and the Epistolary Tradition in the Nineteenth-Century Sciences."

A Cycle of Life—Wastewater Used to Make Fish Food

John Spear, assistant professor of environmental science and engineering, helped form a research group that includes Oberon and CU-Boulder researchers. Together they secured $1.1 million in funding from the NSF.

In an effort to turn an unused byproduct of the beverage industry into a sustainable, protein-rich feed ingredient for the aquaculture industry, two Mines environmental science and engineering alums, an assistant professor and a graduate student have formed an interesting collaboration.

After both graduating with doctorates in environmental science and engineering from Mines in 2002, Seth Terry and Andy Logan founded Oberon FMR, a company that focuses on turning food industry byproducts into protein for use in animal feed.

"We seek to develop and commercialize a sustainable high-protein feed ingredient for animals made from unutilized byproducts of food processing operations," Terry summed up. "Because the byproduct is often viewed as an environmental liability to food manufacturers, our process can provide significant benefits."

Jennifer Terry

Andy Logan, left, and Seth Terry in Terry's Denver garage-come-laboratory during the early days after earning PhDs from Mines. The operation has since moved from the garage.

Wastewater from food processing operations is frequently too nutrient-rich to discharge into municipal water treatment plants, where it would overwhelm the delicate balance of microbial life. Instead, industries must treat it themselves, employing the same principles, but engineering the environment to better handle the nutrient-rich wastewater. The real work of purifying the water is done by microbes, which metabolize the nutrients in which they are bathed. In the process, they multiply, creating a supply stream of biomass rich in protein. Currently, this biomass is composted or buried in landfills. The goal of Oberon is to cultivate the right combination of microbes in these specialized treatment plants so that, once the biomass is dried, they have useable fish food.

To this end, Terry, Logan and environmental science and engineering assistant professor, John Spear, teamed up with collaborators from the University of Colorado at Boulder to land a $1.1 million grant from the National Science Foundation to get the project rolling.

"[Terry and Logan's] side of the grant work is to scale up the technology," Spear explained. "Our side of the grant work is to have a doctoral student further the science aspects." Jackson Lee, a graduate student in environmental science and engineering, will be researching the microbial composition of the biomass.

"Having actually lived off farm-raised tilapia as a Peace Corps volunteer in the Philippines, I definitely see the possibility of food-waste-derived fish food serving a sustainable purpose in numerous countries, not just our own—particularly in societies where protein primarily comes from fish," Lee said.

Spear noted that common fish farming practices, including fish feeding on other fish, are environmentally problematic. "Fish farming is not sustainable. That is the main problem," said Spear. "If you feed fish dried microbial biomass, which most eat anyway as a significant source of their natural diet, they get protein to build their own biomass. It is way more sustainable, perfectly healthy and takes an existing waste stream and puts it to beneficial use. It is a great environmental engineering project."

The team is currently operating pilot facilities at New Belgium Brewery in Fort Collins, where it is using the beer manufacturer's wastewater to produce hundreds of pounds of protein-rich biomass material for feeding trials that will be conducted by feed manufacturers in the near future.

Spotlight

RESEARCHERS

Eileen Poeter

Research: **Water**

Eileen Poeter, director of the International Ground Water Modeling Center (IGWMC) and professor of geology and geological engineering, has earned the esteem of students and colleagues alike.

The National Ground Water Research and Educational Foundation (NGWREF) honored Poeter in 2006 when she was selected by a panel of scientists and engineers to be the 2006 Henry Darcy Distinguished Lecturer. Each year, an outstanding ground water professional is chosen to give the Darcy Lecture Series and share their research with peers and students. The series, established in 1986, now reaches more than 50,000 ground water students, faculty and professionals.

Thomas Cooper, lightboximages.com

Through the lecture series, Poeter presented her research on ground water modeling in 11 countries on five continents in a lecture titled "All Models are Wrong, How Do We Know Which are Useful?"

Poeter's research focuses on ground water modeling and resource evaluation. The models are used to predict ground water conditions under alternative management scenarios. Her research is unique in that rather than developing a single model for a given ground water system, she develops multiple conceptual models, effectively capturing more of the uncertainty in the system. Poeter then helps hydrologists evaluate the models to estimate the uncertainty of their predictions. This provides ground water decision-makers with more information and helps them to achieve a sustainable system.

According to her students, Poeter takes education very seriously. "As a teaching assistant for Eileen, I was amazed at how much time and effort she put into each of her classes," said graduate student Stephanie Schmidt.

"The material is challenging, so the class can be intimidating, but that is exactly what makes it fun—because she is encouraging and will answer any question," said Lacy Jones, one of Poeter's students. "I really respect Dr. Poeter and enjoy her class."

Master's degree student Clint Carney called Poeter one of the "most influential people in my life."

"She has challenged me to be a better hydrologist and to see problems from many different angles," Carney said.

—Reprinted from the School's research magazine, *Energy and the Earth*

David Matlock

Research: **Mechanical Properties**

A member of the National Acadamy of Engineering, David Matlock has built a world-class research center and a worldwide reputation for his vast contributions to mechanical properties research, as well as his outstanding teaching. Matlock is the director of the Advanced Steel Processing and Products Research Center (ASPPRC) and a professor of metallurgical and materials engineering.

Matlock joined the Mines faculty in 1972, and along with colleague George Krauss, founded ASPPRC in 1984. The center has since been recognized as one of the most successful centers of its kind and draws an annual budget of more than $1.5 million. The majority of the center's funding comes from industry support.

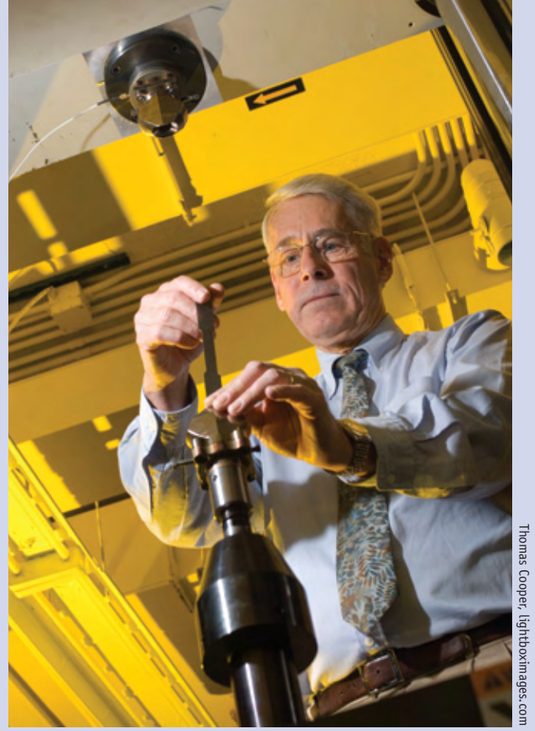
"Research in the center is unique because it brings together competing companies as well as suppliers and customers to work together on research projects that are mutually beneficial to a variety of companies that do not normally work together," Matlock said.

The center's research focuses on microstructural development and the effects of microstructure on the mechanical properties of steel.

One important area of research is the development of new advanced high strength sheet steels for use in affordable lightweight automobiles. The drive to reduce fuel usage and maintain safety propels this critical research.

Development of high-strength pipeline steels for the oil and gas industry is a second area of energy-related research, driven by the need to produce either oil in deep-sea locations or natural gas from remote locations.

New pipelines will require steels with significantly improved mechanical properties. Improvements based on ASPPRC research efforts will impact oil and gas production and "in some cases make previously unavailable energy sources viable," said Matlock.



Thomas Cooper, lightboximages.com

To support the extensive research conducted by members of ASPPRC, Matlock has developed first-rate mechanical testing laboratories, including a high strain rate mechanical system. Extremely rare in a university laboratory, this system has the capability to simulate material behaviors in a car crashing into a concrete wall at 35 miles per hour and then assess the damage and properties of automotive structural steels.

Matlock's laboratories are also available to students through many lab-based classes. Matlock says he likes having "the opportunity to continually learn and, where possible, pass on the information to students."

"Professor David Matlock is easily the best instructor I have ever had. He instills in his students the capacity to learn and understand difficult concepts and start thinking about the next step," said Mark Richards, a PhD candidate.

—Reprinted from the School's research magazine, *Energy and the Earth*

Tissa Illangasekare

Research: **Environment**

According to his students, Tissa Illangasekare is a demanding professor who sets high standards. Illangasekare is the AMAX Distinguished Chair and Professor of Civil Engineering at Mines.

"I felt challenged every day, but once I was done with my thesis, I felt very proud to have worked at Tissa's side and in his great research group," said Lisa Porta, MS student in Environmental Science.

Illangasekare's research is aimed at protecting water resources and the environment through the study of flow and transport in porous and fractured media. This translates to the development of models that simulate the flow of water (most specifically groundwater) and transport of chemicals to gain an improved understanding of the processes that control these phenomena. The applications for Illangasekare's research include management of surface and subsurface water, remediation of subsurface systems that are contaminated with petroleum and organic waste, effects of natural disasters on groundwater, arctic hydrology (as it applies to sea-level rise) and dam stability analysis.

Tim Ryan

In conjunction with his teaching and research, Illangasekare has published numerous book chapters and more than 200 technical articles in refereed journals and proceedings. Illangasekare is also the director of the Center for the Environmental Study of Subsurface Environmental Process (CESEP), a collaborative center between several universities, national laboratories and industry partners.

Illangasekare receives his funding from federal, state and industry sources and has collaborated with scientists and engineers from Denmark, the United Kingdom, Spain, Sri Lanka, Sweden, South Korea, Japan, the Czech Republic, Germany and Australia. He has also offered many workshops and seminars to students around the world.

In 2006, Illangasekare was elected a fellow of the American Association for Advancement of Science for his significant contributions to understanding flow and transport processes in soils and groundwater. In 2005, Illangasekare was elected a fellow of the American Geophysical Union in recognition of his contributions to understanding the behavior of organic chemicals in a heterogeneous subsurface. Illangasekare was also elected a fellow of the American Society of Civil Engineers in 2005. In addition to his honors, Illangasekare is registered as both a professional engineer and professional hydrologist, and is a diplomate of both the American Academy of Environmental Engineers and the American Academy of Water Resources Engineers. Illangasekare is also the current director of Hydrologic Sciences Program at the National Science Foundation.

—Reprinted from the School's research magazine, *Energy and the Earth*

Spotlight

STUDENTS

Emily Milian

Year: **Senior**
Major: **Mathematical and Computer Science**

Emily Milian's email signature features a quote by Mahatma Ghandi: "You must be the change you wish to see in the world." Upon graduation, she intends to be that change. She's joining the Teach for America program and moving to Arizona, where she plans to teach math to at-risk middle school students. "I believe math is so important for kids to understand," she says. "Many more doors are open for you if you are proficient in math. If not, many doors are closed."

Milian, who received the prestigious Florence Caldwell Achievement Scholarship each of the four years she has attended Mines, will also earn a master's degree in secondary education at Arizona State University while she teaches.

Emily's plans aren't the dreams of a wide-eyed idealist; joining Teach for America is the latest in a long string of charitable projects. She has served as vice president, district lieutenant governor and district conferences chair for Circle K International, a collegiate service organization which honored her for completing over 100 hours of volunteer work annually.

Additionally, Emily chaired the 2006 campus-wide community service day, "Into the Streets," which was named, "Best School-Wide Program." She also designed and implemented the Middle School Engineering Outreach Program for Mines' Society of Women Engineers.

"I really like explaining things and acting as a mentor," she says. "I also find that I learn so much from the people I'm supposed to be teaching."

Deb Lasich, executive director of the Women in Science, Engineering and Mathematics program, met Emily through the Florence Caldwell scholarship. "Students who get taught by her will be very fortunate," says Lasich. "Emily is very excited about what she's doing. She will be on the front lines, making it possible for young people to go on in math and science careers."

But Milian says she is simply doing what feels right: "I have faith in the world and a lot of people out there are doing something to improve it. I want to do my part."

Zach Aman

Year: **Junior**
Major: **Chemical Engineering**

You don't hear an engineering student say *this* too often: "Everyone should go to college and learn how to write a news story."

But that's exactly how Zach Aman, a junior studying chemical engineering feels. Aman is editor-in-chief of *The Oredigger*, Mines' 88-year-old newspaper. When Aman joined the weekly paper during his first year, it had a circulation of 1,500. Today, it boasts a circulation of 2,700 and is a hot commodity on campus.

Aman, who was born in Denver and grew up in Grand Rapids, MI, says his passion for journalism came out of the blue. "I was in the half-credit class you take as a freshman, CSM 101, which introduces you to a mentor," he recalls. "My mentor was the newspaper's opinion editor and he recruited me within a week. The funny thing is, the night I walked in was the night he quit." Undaunted, Aman dove in. "I've always been pretty darned opinionated," he jokes.

Two and a half years later, Zach is credited with leading a renaissance at *The Oredigger*. He says his motivation comes from an engineer's natural quest for improvement and from a passion to serve his community.

"The way my personality is, I have a problem looking at things and accepting them as they are," he explains. "The primary value we add to the entire Mines community is that we create a forum of communication that can integrate all constituents of this organization."

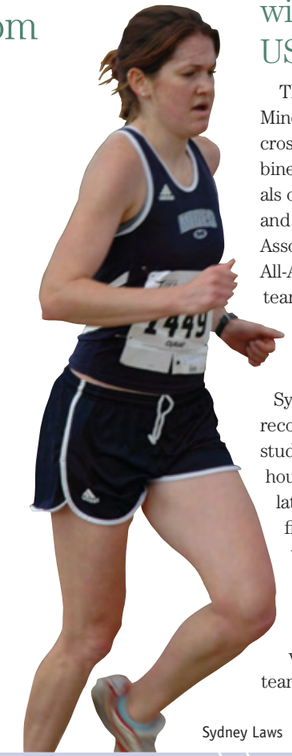
David Frossard, who works for Academic Computing and Networking, is the paper's faculty advisor and says Aman is a natural leader. "Zach has done all kinds of unglamorous but crucial grunt work that you never hear about," says Frossard. "And, of course, it doesn't hurt that Zach is such a charismatic figure. I've noticed many times how he asks staff to take on more work, more responsibility, and they are happy to do it.

"It's not that he's conning anyone. It's that everyone wants to follow him, to be part of his orbit. And he works hardest of all."

CSM Athletics Receives 2007 Civic Award from Golden Chamber of Commerce

In December of 2007, the Colorado School of Mines Department of Athletics was selected to receive the 2007 Civic Award from the Golden Chamber of Commerce. The award was presented by the Golden Chamber of Commerce Board of Directors at a luncheon on January 17th at Rolling Hills Country Club in Golden.

"It was an honor to receive the 2007 Civic Award from the Golden Chamber of Commerce," said Tom Spicer, director of athletics. "Our student-athletes and staff continuously strive to work for the betterment of the Golden community. We are very grateful to the Golden Chamber of Commerce Board of Directors for this recognition."



Sydney Laws

Cross Country Teams Run Away with Academic Honors from USTFCCCA

The Colorado School of Mines men's and women's cross country teams combined to place three individuals on the U.S. Track & Field and Cross Country Coaches Association's (USTFCCCA) All-Academic Cross Country teams in 2007.

Aaron Swift

Aaron Swift and Clifton Oertli were named to the men's team, while Sydney Laws garnered recognition for the Oredigger women. In order to qualify, a student-athlete must have completed at least 24 semester hours at their current institution and have amassed a cumulative GPA of 3.25 or higher. The student-athlete must also finish in the top 30 percent of individual participants at their respective regional cross country championships.

In addition, both the CSM men's and women's cross country squads earned USTFCCCA All-Academic Team awards in 2007. Teams must compete at the NCAA Division II regional championships and have a cumulative team GPA of 3.00 or higher to receive this honor.

CSM Athletics Home Schedules Remaining Games Spring 2008

BASEBALL

Apr. 18	Regis University	7:00 pm
Apr. 19	Regis University (DH)	1:00 pm
Apr. 20	Regis University	12:00 pm
Apr. 25	CSU - Pueblo	7:00 pm
Apr. 26	CSU - Pueblo (DH)	1:00 pm
Apr. 27	CSU - Pueblo	12:00 pm
May 2	Nebraska - Kearney	7:00 pm
May 3	Nebraska - Kearney (DH)	1:00 pm
May 4	Nebraska - Kearney	12:00 pm

SOFTBALL

Apr. 19	Chadron State (DH)	12:00 pm
Apr. 20	Chadron State (DH)	11:00 am

MEN'S GOLF

Apr. 21-22	NCAA II Northwest Regional (The Pinery C.C.)	Parker, CO

Thompson Selected 28th Overall by Houston Dynamo in 2008 MLS Supplemental Draft

Former Colorado School of Mines men's soccer player, Craig Thompson, was drafted by the Houston Dynamo in the 2008 Major League Soccer (MLS) Supplemental Draft on January 24, 2008.

A native of Littleton, CO, Thompson was selected 28th overall by Houston. Thompson, who garnered NSCAA / adidas First Team All-Midwest Region honors following his senior season in 2007, also earned First Team All-Rocky Mountain Athletic Conference (RMAC) and Daktronics First Team All-Midwest Region accolades last fall.

Selected as the RMAC Player of the Year and the RMAC Academic Player of the Year in 2007, Thompson established a new individual single-season school record with 18 goals in 2007. Thompson, who also led Mines in assists (tied – five) and game-winning goals (four) last fall, tied CSM's individual single-season program record for total points (41) during his final season in an Oredigger uniform.

A three-time Academic All-RMAC performer in the classroom (2005, 2006 and 2007), Thompson also garnered First Team All-RMAC, NSCAA / adidas Second Team All-Midwest Region and Daktronics All-Midwest Region laurels as a junior in 2006.

Seven Student-Athletes from CSM Basketball Teams Earn Academic All-RMAC Recognition in 2007-08

A combined total of seven student-athletes from the CSM men's and women's basketball squads have been recognized on the 2007-08 Academic All-RMAC teams.

Emily Przekwas

Ben Mohr

Earning recognition on the Academic All-RMAC Honor Roll for the Oredigger women were Elise Goggin, Liz Jeffries, Julie Marshall and Emily Przekwas. On the men's side, Ben Mohr earned First Team Academic All-RMAC accolades, while Levi Hamilton and Casey O'Hayre both garnered recognition on the Academic All-RMAC Honor Roll.

To qualify for Academic All-RMAC recognition, student-athletes must have a cumulative GPA of 3.20-or-better, be a starter or key reserve and have completed a minimum of two consecutive semesters (or three quarters) at their current institution.

Oredigger News & Notes...

• The CSM Department of Athletics has added three new coaches to its staff: Bob Benson is the Orediggers' new associate head football coach / defensive coordinator, Lori Scheider returns for her second stint as the assistant women's soccer coach and Heather Roberts will be the new assistant volleyball coach.

Derek Dykstra

• Six players from the Mines football team were named to the 2007 National Football Foundation (NFF) & College Hall of Fame - Colorado Chapter All-Colorado Team. Derek Dykstra and Stephen Immel were both First Team selections on offense, while Drew Ferren, Marc Schiechl and Marin Richardson garnered First Team accolades on defense. Kevin Folly-Kossi earned recognition on the Second Team defense.

For complete schedules, rosters, results and statistics, please visit the Colorado School of Mines Athletics website at http://athletics.mines.edu.

An investment in knowledge always pays the best interest.
—*Benjamin Franklin*

Marquez Hall fundraising hits $16.3 million

School looks to raise additional $4 million before groundbreaking

Groundbreaking for a new building to house Mines' petroleum engineering program has been slated for Spring 2009, pending an additional $4 million in contributions toward the project. Launched with Tim '80 and Bernie Marquez's landmark $10 million challenge gift in 2005, the fundraising campaign has now attracted $6.3 million in matching gifts and commitments from Mines' corporate partners, alumni and friends. Key features of the building will include

- 60,000 square feet of customized classrooms, and teaching/research laboratories
- smart classrooms equipped with wireless networking and interactive multimedia technology
- capacity for increased faculty research activities and expanded student enrollment
- multi-purpose visualization classroom to support cutting-edge instruction.

"Thanks to the generosity of some of Mines' most committed donors and corporate partners, we are well on our way to our goal of raising $25 million for Marquez Hall," said President Bill Scoggins. "We are particularly eager to raise the additional funds to match the $10 million Marquez gift by this summer. Once the building is complete, we will have the capacity to provide an even better education for the petroleum engineers who will help our global society meet energy demands for the future."

Leading contributors to Marquez Hall to date ($25,000 and above)

Timothy M. '80 and Bernadette Marquez	$10,000,000
EnCana Oil & Gas (USA)	$2,000,000
Harry D. Campbell '42	$700,000
Noble Energy	$500,000
Marshall C. III '67 and Jane Crouch	$250,000
St. Mary Land & Exploration	$125,000
Bonanza Creek Energy	$100,000
Whiting Petroleum	$100,000
Michael '83 and Patricia '83 Starzer	$50,000
Joe S. '42 and Mary G. Keating	$26,174
William J. Barrett	$25,698
Lawrence '49 and Rose Curtis	$25,000

Several other corporations and individuals have made generous commitments that we are unable to publish at this time.

Mike and Patty Starzer, Class of 1983

Generosity for the next generation

Since they walked across the stage at Colorado School of Mines commencement in 1983, Mike and Patty Starzer have maintained a strong connection with their alma mater.

Current co-chairs of The Parents Fund and members of the President's Council and the CSM Alumni Association, the Starzers have been giving to Mines for decades. This year, in honor of their 25th reunion, the couple made a generous major gift to help finance the construction of Marquez Hall.

"The education we received at Mines laid solid groundwork for our careers," say the Starzers. "What better way to celebrate our 25th reunion than to make a gift that will have a real impact on campus?" The Starzers' contribution to Marquez Hall will help enhance the Mines experience for future generations of students, enabling them to enter the workforce prepared. "We hope the new facility will continue to draw national recognition, top-quality professors and talented students to the School," they said, "and that it will serve as a dynamic center of teaching and learning."

Mike is president, CEO and co-founder of Bonanza Creek Energy Company in Bakersfield, CA, one of Mines' corporate partners that has pledged an additional $100,000 for the new, state-of-the-art petroleum engineering building. Though he was born in Tulsa, Mike grew up in Alaska and chose Mines for its reputation among oil industry insiders, and its proximity to the ski slopes. For Patty, a Colorado native, Mines was the ideal choice to study math and the applied sciences, enabling her to remain close to home. Mike and Patty met at Mines through mutual friends and married soon after graduation.

Today, the Starzer's daughter, Moriah (Class of '11), is following in their footsteps, pursuing a petroleum engineering degree at Mines. "Since she was four years old, we've dragged Moriah to campus to visit the Geology Museum, the Mines Bookstore and the Golden community; she already felt somewhat comfortable here and opted for the quality small school environment," said Patty. With only a few months behind her at Mines, Moriah already loves Colorado and is adjusting to the balance of academics and social independence, and looking ahead to future challenges.

The Starzers are proud that their daughter has chosen to attend Mines, and they are committed to making a meaningful difference for future students through continued philanthropic leadership. "Our professional successes and the ability to give in appreciation for the ways we've been blessed are what have inspired us to support Mines," the Starzers said. "We hope Moriah will find an exciting and fulfilling career after graduation, and that she too will have the ability to give to others."

The Adolph Coors Foundation Contributes $1,022,000 to Mines; Other Recent Gifts

Colorado School of Mines recently received nine large gifts:

The Adolph Coors Foundation contributed a total of $1,022,000 to support the Student Recreation Center, the William K. Coors Distinguished Chair in Chemical Engineering, and the Herman F. Coors Professorial Chair in Ceramics.

Steve '64 and **Dollie Chesebro**' made a $110,000 gift to support the Darden Baseball Field, and to establish a new endowment that will provide funding for recruitment of student athletes to Mines' football and baseball programs.

Chevron contributed $156,500 to support the Oil Shale Symposium and several departments, programs, scholarships and student organizations.

Helen Elizabeth Swank Cook gave $100,000 in memory of her late husband to establish the Dr. Charles Falk Cook Fund, which will provide fellowships for graduate students in the Department of Petroleum Engineering. Dr. Charles Cook served as the manager of Philips Petroleum's research and development department for much of his career; he was honored with a Mines Medal in 1991.

EnCana Oil & Gas (USA) Inc. contributed gifts totaling $413,356 toward their $2 million pledge for Marquez Hall and the Oil & Gas Exploration Workshop.

Noble Energy Inc. contributed $125,000 toward their $500,000 pledge to Marquez Hall.

Shell Oil Company contributed $115,000 for departmental support, the Career Center, the Minority Engineering Program, the McBride Honors Program, the Mobile Science Show, student groups, and graduate fellowships.

St. Mary Land & Exploration Company pledged $125,000 toward Marquez Hall and contributed $25,000 toward their endowed scholarship fund for petroleum engineering students.

Whiting Petroleum Corporation contributed gifts totaling $200,000 toward Marquez Hall and the Department of Geology and Geological Engineering.

Other recent gifts over $25,000 from individuals, corporations and foundations:

Anadarko Petroleum Corporation contributed $25,000 to support the Department of Petroleum Engineering.

Apache Corporation contributed $43,095 to support fellowships in the Department of Geology and Geological Engineering.

Aqua-Aerobics Systems, Inc. contributed $30,000 to support the Advanced Water Technology Center (AQWATEC).

The ARCS (Achievement Rewards for College Scientists) Foundation contributed $45,000 toward scholarships for nine students.

William J. Barrett, friend of the School, made gifts totaling $25,698 to support the Department of Geology and the construction of Marquez Hall.

Bonanza Creek Energy Company contributed $50,000 toward their $100,000 pledge for Marquez Hall.

BP contributed gifts totaling $46,100 for department and student group support, scholarships, and the Minority Engineering Program.

Marshall C. III '67 and **Jane Crouch** gave gifts totaling $63,000 to support the geology and geophysics departments, and to make a payment on their $250,000 commitment to Marquez Hall.

Jack D. Duren '48 gave a $38,000 unrestricted gift to The Mines Fund.

Henry H. Gruver '57 established a new endowment at Mines with an initial $77,630 gift.

The Halliburton Foundation contributed $30,000 to support scholarships and fellowships in the Department of Geology and Geological Engineering.

Ralph L. Hennebach '41 continued his support of the Hennebach Visiting Professorship and Program in the Humanities with a gift of $95,050.

Hess Corporation contributed a total of $55,000 to support the Department of Petroleum Engineering and a geophysics graduate fellowship.

Infiltrator Systems, Inc. continued their support of research and educational activities in the area of on-site and alternate wastewater technologies with recent gifts totaling $93,000.

Al Ireson '48 made gifts totaling $60,500 in continued support of both The Mines Fund and the Ireson and Family Endowed Scholarship Fund.

Howard E. '76 and **Cherine Janzen** made pledge payments totaling $88,343 in continued support of engineering education at Mines.

Bob Lame '59 gave $32,661 in contributions to The Mines Fund and the Lame Endowed Scholarship Fund.

Michael G. Long '72 made an additional $25,000 gift to the Nations Petroleum Endowed Scholarship Fund, an endowment he established to support students from Kazakhstan and the surrounding area.

Carolyn V. Mann made a $50,000 gift in continued support of the John and Carolyn Mann Graduate Fellowship in Geology Fund.

Laurence S. '39 and **Dorothy Melzer** contributed $20,000 to The Mines Fund and $10,000 in continued support of the William and Grace Waldschmidt Scholarship Fund.

F. H. Merelli '59 contributed $20,000 in unrestricted funding to The Mines Fund and $50,000 in continued support of the Department of Petroleum Engineering.

A bequest distribution of $35,000 was received from the estate of **Daniel Pavone** '48, MS '51 in support of The Mines Fund.

Peabody Energy gave $25,000 to the Department of Mining Engineering.

Robert Bosch LLC contributed $28,500 to support research in the Division of Engineering.

Tom '53 and **Mary Rollins** made gifts totaling $50,000 in support of the Darden Baseball Field Fund and the Rollins Endowed Scholarship Fund.

Charles E. '61 and **Louanne Shultz** continued their support of the Shultz Athletic Scholarship Endowment Fund with a $98,958 contribution.

Mike '83 and **Patty** '83 **Starzer**, current co-chairs of The Parents Fund, gave $50,000 to support the construction of Marquez Hall in honor of their 25th Reunion.

The United States Steel Foundation contributed $25,000 toward scholarships for twenty students in the Department of Metallurgical and Materials Engineering.

The Viola Vestal Coulter Foundation contributed $35,000 to support the Coulter Chair for Mineral Economics.

James R. Weber '71 contributed gifts totaling $38,000 to support the Department of Geology and Geological Engineering and the Jack R. and Mary D. Weber Endowed Fellowship Fund.

Olin D. '58 and **Jackie Whitescarver** established the Whitescarver Family Endowment for Colorado School of Mines with a $27,000 gift, and contributed $500 in support of the Jack Hancock Endowed Scholarship Fund.

SEISMIC Solutions

How Mines is gathering valuable data on carbon sequestration as it helps the energy industry recover oil from depleted reservoirs.

By Nicole Branan

The statuesque derricks that dot Postle Oil Field work relentlessly in the fierce winds that sweep across the farmlands of Oklahoma's panhandle. For half a century, the pump jacks have been plunging more than a mile deep into the ground to squeeze up the black gold that powers large parts of the mid-continent. But what they have brought up to the surface in recent years is only a shadow of what it used to be. When the wells first started operating they were producing nearly pure oil; today much of it contains water. "For every 100 barrels, you pump up 95 or more of water and only about 5 of oil," says Tom Davis, professor of geophysics at Mines, who earned his doctorate from the department in 1974.

The field isn't running out of oil; about two thirds of the reservoir's original 320 million barrels are still buried underneath the nearly 100-square-mile patch, but producing them at economic rates is a tough challenge. A few years ago, oil companies started to flood parts of Postle with liquefied carbon dioxide to reduce the oil's viscosity and make it easier to squeeze out of the sandstone, a technique called enhanced oil recovery, or EOR. But making such operations successful requires detailed knowledge of the subsurface, and that's where Davis and his team from Mines come in.

Stephen Coburn/Shutterstock

Davis leads the Reservoir Characterization Project, an industry-sponsored consortium that develops and applies seismic remote sensing to improve oil recovery in mature fields like Postle. Seismic sensing systems can peer underneath the surface and visualize the fractures and passages that vein the hundreds of layers of sediments that piled on top of oil reservoirs over millions of years. "It's like medical imaging," Davis says. "We look for cracks in the ground just like a doctor looks for the crack in a person's broken leg."

In particular, Davis' team can watch and sometimes predict the movement of injected carbon dioxide. That's essential for EOR, but it is also crucial for an entirely different endeavor: carbon sequestration. Because EOR operations consume megatons of the climate change culprit carbon dioxide, these projects have led to an unusual collaboration between oil behemoths and environmental groups. From the perspective of an oil company, depleted oil fields are worthless empty holes deep in the ground, but to scientists looking for a place to sequester greenhouse gases, these reservoirs may be the storage tanks they have been looking for. "We talk about trying to get rid of the stuff and this is the natural place to do it," Davis says.

Once injected into a reservoir, carbon dioxide acts like a scrubbing agent. It mixes with the oil, turning it into a slippery fluid that more readily flows through rock. At the wells, operators capture the blend and recycle the gas. However, only part of the carbon dioxide dissolves in oil and returns to the surface. As much as half of it remains underground, where it dissolves in water and over time becomes part of the reservoir rock. "These two processes of enhancing recovery and storing go hand in hand," Davis says. But they need to be optimized to be successful and seismic remote sensing technologies are the key for that.

To develop accurate three-dimensional reservoir models, Davis and his team "light up" the subsurface with different seismic waves. In the same way that our brains form visual images from light reflected by surrounding objects onto our optic nerve, Davis and his team image the underground by producing seismic waves at the surface and recording the resulting series of echoes with an array of sensors. While conventional seismic techniques often measure only sound or compression

waves, Davis and his team also use shear waves, which are more difficult to detect and analyze but much more useful for finding cracks and other formations that could channel fluids, he says.

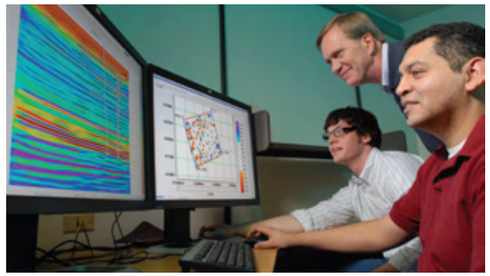
At Postle the team has wired up a six-square-mile patch that is scheduled for EOR in the coming months. A mile-long string of digital sensors reaches through a defunct well bore all the way down to the reservoir and nearly 2,000 others blanket the dirt surface like a gigantic spider web. These sensors are hooked up to million-dollar instruments that monitor the reservoir like a patient in intensive care. Trucks carrying hydraulic vibrators roam the field and stop every few feet to drop 60,000-pound weights that shake the ground like a miniature earthquake, sending seismic waves deep into the surrounding strata. Listening on the surface, Davis and his team record the seismic waves that echo back up after each 60,000-pound hammer blow.

At Mines, Davis and his students constantly develop new and better algorithms that can translate the enormous mountains of raw seismic data into three dimensional models. Many conventional seismic techniques leave it at that, but Davis adds a fourth dimension to the process: time. He plans to return to Postle to image the ground again several times in coming years to check up on the carbon dioxide flow after the EOR process has started.

The four-dimensional maps he can create through this process are invaluable for oil companies, such as Postle operator Whiting Petroleum Corporation, who would work completely in the dark without them. "Usually, operators are at the mercy of what the reservoir dictates in terms of what comes out of the producing well," says Scott Wehner, Operations and Engineering Manager at Whiting Petroleum and member of RCP's Advisory Board. "But the seismic sensing technology basically gives us an X-ray of the reservoir and we can see into it at different points in time." If the carbon dioxide is not moving the way they want, operators have the ability to be proactive and make changes to influence pressure and flow direction to help push the plume back on track. The maps also reveal blockages that can trap carbon dioxide, Davis says. "You need to see where such barriers are so that you can inject carbon dioxide in the most effective location." The ground underneath Postle consists of a channel system made of ancient riverbeds. Once operators have a model of this labyrinth, they can align wells to ensure that they actually inject into the channels. And there is always the exploration aspect, Davis says. "We may find another, deeper oil reservoir or outlying pockets of this reservoir that haven't been discovered yet."

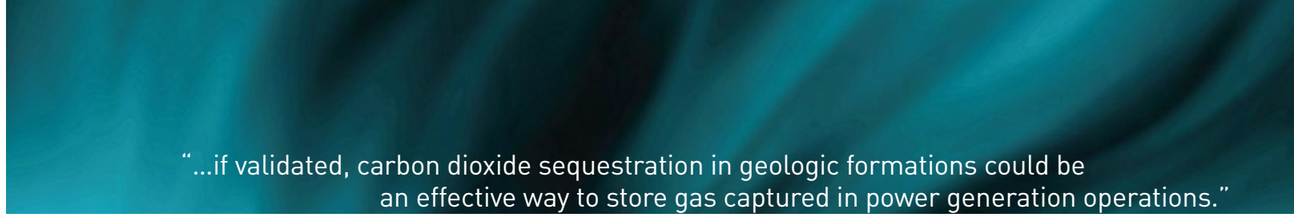
The remote sensing technology that Davis employs has enormous advantages over old-fashioned drilling and sampling operations used in the past. Not only do Davis and his team leave a minimal footprint on the field, consisting of no more than a few truck tracks, but their technique also minimizes safety concerns. And in fields where liquefied carbon dioxide is forced through rock at 2100 psi, things can and do go wrong. Some oil fields still contain defunct open well bores that no one knows about because operators cut the wellheads off years ago and covered them up, Davis says. It's important to find these zones by mapping the underground because if there is a leakage, tons of the asphyxiating gas can rapidly escape into the atmosphere.

Davis' team has used the technology in numerous oil fields, including the Weyburn field in Canada, where it played an integral part in the International Energy Agency (IEA) Greenhouse Gas Programme's Carbon Dioxide Monitoring & Storage Project. One of the project's objectives was to test various carbon dioxide tracking methods, including Davis' four-dimensional seismic remote sensing technology. "Four-D seismic is very good at measuring small changes in concentration,



Thomas Cooper, lightboximages.com

Geophysics Professor Tom Davis stands by a hydraulic vibrator truck (top left) that drops 60,000 pound weights onto the ground, creating seismic waves that "light up" the subsurface. They are imaging the migration of CO_2 through an oil reservoir 6,000 feet below the surface. The gas is injected through well heads (right) at 2,100 psi. Once the data is collected, it is interpreted back on campus (bottom left) by staff and students of the Reservoir Characterization Project



"...if validated, carbon dioxide sequestration in geologic formations could be an effective way to store gas captured in power generation operations."

which means that it's very good at following the front of the carbon dioxide plume," says Brendan Beck of the IEA. And because seismic sensing can be done remotely, it will likely become the predominant monitoring technology once a formation has been filled and closed.

Since Davis started the RCP some 23 years ago, he and hundreds of students worked in numerous locations in North America and Canada, including the Permian Basin—America's energy hotbed—that spreads from Texas into New Mexico. But when Whiting Petroleum requested assistance at Postle, RCP took on their greatest challenge to date—the reservoir is much thinner and lies at greater depth than anything the RCP has encountered so far. "We are trying to make this technology work for thinner and thinner bed forms to give it a much more widespread application," Davis says. "The Weyburn Field, with a thickness of about 100 feet, was a breakover point because we could see this thin reservoir and see the carbon dioxide move even at a depth of close to a mile." Postle is no more than 60 feet thick and lies even deeper, at more than 6,000 feet. And the carbon dioxide flooding projects that the RCP is investigating at Postle are located at the field's outer limits. That's a particularly important area for sequestration, Wehner says. "The question is 'Can we see the outer channels nice and crisp, and can we see whether the carbon dioxide will leak into the surrounding area?'"

Questions like these need to be answered before large-scale storage can become reality. But if validated, sequestration in geologic formations could be an effective way to store carbon dioxide captured in power generation operations. Even though sequestering carbon dioxide in depleted oil and gas fields is a finite solution—they would eventually all fill up—these formations could provide an excellent starting point. Wehner points out that the common understanding is we will eventually have to store it in saline aquifers as well. But sequestration in oil reservoirs in conjunction with EOR can help develop the network of pipelines that is needed to move large volumes of carbon dioxide around, because using the gas for EOR generates revenue. "That means that there is a way to pay for the required infrastructure," Wehner says. "Once you move to sequestration into a saline aquifer, there is no offset, it's just full cost unless a viable carbon credit market develops."

Ironically, as scientists and engineers around the world deliberate on how to get rid of carbon dioxide, the 74 EOR projects in the United States are using 33 megatons each year, most of it mined from natural underground reserves. And the price of carbon dioxide is going up all the time because natural sources can't satisfy demand from EOR operations. "There are existing [EOR] projects that cannot expand because the supply of natural carbon dioxide is limited or constrained," says Michelle Michot Foss MS '85, chief energy economist and head of the Center for Energy Economics at the University of Texas at Austin. Part of the problem is that pipelines built in the early 1980s are not large enough to handle the demand there is today. That's why many operators are looking at the economics of capturing carbon dioxide from industrial sources. But "this is extremely complex—a very large number of conditions have to be satisfied for captured carbon dioxide to work and for the captured carbon dioxide-EOR link to be commercially feasible," Foss says. Collecting the stream of gases that power plants spew into the atmosphere and separating carbon dioxide from it can drive up the price well above economic thresholds, Davis adds.

The carbon dioxide that is currently flowing through Postle comes from the Bravo Dome, a large natural reserve some 127 miles down the pipeline in northern New Mexico. However, a smattering of ethanol plants that are currently being built around the Postle area could, in principle, provide an industrial source in the future. But the process of capturing and liquefying the carbon dioxide exhaust from such ethanol plants is still cost-prohibitive, Wehner says. Technologies such as coal gasification utilized in a handful of power plants fare slightly better. These vent carbon dioxide at higher pressures, making it more attractive for EOR customers who need carbon dioxide in its liquid form. One of the first EOR users to tap into such man-made sources of the gas was Weyburn Field operator EnCana. "In this particular case, natural carbon dioxide sources were remote—as far away as Wyoming," Davis says. That made it economically attractive for EnCana to purchase from the Great Plains Synfuel Plant, a coal gasification facility near Beulah, ND.

The largest hindrance to large-scale adoption of such schemes is the lack of incentives, such as tax breaks to capture and store carbon dioxide, Beck says. "Reducing the costs, getting the incentives and working out a regulatory regime for storing carbon dioxide which governments are currently working on, are the biggest issues right now."

The potential could be enormous. Over the past five decades, Postle has undergone a sequence of recovery operations typical for North American oil fields. Operators first produced the wells naturally for a few years and once recovery declined they began to inject water, a process called secondary recovery, that pushed the oil to the wells. But because water doesn't mix with oil, it tends to bypass much of it. "Primary and secondary recovery operations typically only get a total of 25 to 30 percent of the oil out." The remainder sometimes called attic oil won't come out voluntarily and diluting it with carbon dioxide is sometimes the only way to mobilize it. As oil fields around the world are aging, even some of the world's largest producers, such as Saudi Arabia, have begun to talk about carbon dioxide injection. "We are definitely going to see more and more EOR projects in the future," Davis says, adding that the process can increase the recovery of unconventional oil and gas resources as well. Seismic remote sensing will play an important role in all of these projects. "I think we have a very bright future ahead of us by doing this kind of work and we are excited to be involved at the forefront." M

Mines has taken the lessons of history and designed a one-of-a-kind humanitarian engineering program.

Humanitarianism Reengineered

By Doug McPherson

Clockwise, beginning top left: The people of Colinas de Suiza, Honduras, bury 4-inch pipe for their town's new water system; senior Alison Bratrsovsky shows teachers at the Wanyange Girls School in Jinja, Uganda, how to operate a GPS; seniors Natalie Wagner, Michael Gulsvig, Shannon McNamara and Michael Hoban plan for the next day's work in Colinas de Suiza; Geophysics graduate student John Jackson prospects for water in Makondo, Uganda.

Twenty five years ago, the United Nations declared the 1980s to be the decade of water supply and sanitation and set out to install clean water systems in numerous poorer countries. It made sense. And the intentions appeared as pure as the water they hoped to deliver.

The U.S. Agency for International Development funded a prestigious U.S. engineering firm to set up the water and sanitation systems. And the firm delivered, installing systems that brought water to over 1.2 billion people and sanitation to nearly 770 million around the globe by 1990.

Back then it was easy to say the mission was accomplished.

Yet, by just about any measure, the effort failed. In less than 10 years, 88 percent of the systems were no longer operating. Why did this noble endeavor evaporate?

Several reasons, says Jon Leydens, writing program administrator in the Division of Liberal Arts and International Studies, who studied and taught on the United Nations effort.

First, he says the engineers didn't factor in the perspectives, needs, values and aspirations of the people in the communities they were trying help. "They just went in, installed the systems and left," Leydens says. "They were paid for how many systems they installed, not for how sustainable the systems were over the long term."

What's more, Leydens says the communities had no sense of ownership or investment in the projects, and no one shared how to operate or maintain the systems.

The United Nations came away from the project having learned a costly lesson: if humanitarian relief efforts are to be sustainable, the skills, knowledge and resources of the local community must be factored in.

"Technology and socio-cultural realities are intertwined in subtle and complex ways," Leydens says. "The world is changing profoundly, and engineers, when properly educated, have tremendous potential to contribute to sustainable, humanitarian projects."

At Mines, this potential is being realized through the Humanitarian Engineering Program. One of the first of its kind in the country, the program provides a minor that complements the technical curriculum with humanities and social science courses designed to cultivate ethical maturity, cultural awareness and a fundamental understanding of economics, says David Muñoz, associate professor in the Engineering Division and director of the program.

Assisted by a $1.17 million grant from the William and Flora Hewlett Foundation, Muñoz and a team of colleagues from the Division of Liberal Arts and International Studies, the Engineering Division and Engineering Physics launched the program five years ago. "The curriculum reflects the complexity of humanitarianism," says Muñoz. "We now know it's not as simple as going in and building systems; we have to build

relationships, seek indigenous knowledge, look for ways to build capacity and promote ownership."

Muñoz believes the program is not only about changing the way engineering is taught, but also about nudging "society to reconsider the type of student it encourages to enter the field of engineering."

Natalie Wagner, a civil engineering major who is earning a minor in humanitarian engineering, says the program actually motivates her to finish her degree. "Honestly, it's the only way I can see myself getting through engineering school. The academics are rigorous, so I need to see that there's potential for my work to make a positive impact on other people's lives when I graduate," she says. Wagner calls the program unique and adds that she feels "very blessed to have found it."

Some of the courses Wagner and other students in the program take include groundwater mapping, design of small renewable energy sources, ethics in engineering, political philosophy and engineering, engineering cultures in the developing world, and proposal writing. In the proposal writing course, taught by Leydens, students have written proposals to fund projects involving drinking water for Haitian villages, medical supplies in Darfur and schools in Nicaragua.

Muñoz says another popular course is senior design, in which students taking the minor design humanitarian engineering solutions for underserved communities. And these practical projects have yielded dramatic results.

Environmental science and engineering graduate student. Ana Ruiz, talks with Doña Reyna about her new passive gray water system in Colinas de Suiza.

In the five years since the humanitarian program was launched, over 200 students have worked on over 50 projects in 10 countries spread across four continents, ultimately helping tens of thousands of people enjoy more comfortable lives. They've helped with bridge building, water irrigation systems, hydro-electric projects, solar-powered electric programs, village lighting, easy-to-use water systems, and even durable and affordable wheelchairs.

One of the program's largest undertakings has been to install a complete potable water and sanitation system for a remote Honduran village.

The story begins when Hurricane Mitch left thousands homeless in 1998. As part of the relief efforts, the government made land on higher ground available to 10,000 of those displaced in the Sula Valley. However, their new town site did not have a water supply. In fact, the residents had to pay for water to be delivered from the valley below by water tanks mounted on trucks. Meanwhile, the pit latrines they were all using threatened to contaminate their down-slope water supply.

After learning of the problem, Muñoz led students to the new village of Colinas de Suiza, where they surveyed the needs, forged relationships and formulated preliminary plans for a 250,000 gallon water storage tank and a village-wide distribution system. Muñoz and the students found that the villagers were eager to help with the work and to help pay for it with contributions of $100 per household. "Ultimately, the community members will have to maintain the systems, so it is imperative that they own it."

Today, the locals are very thankful for the School's work. Don Francisco Mazariego, president of Colinas de Suiza's town council, says the community's vision is "to continue to improve so that children can have a better future." Adding, "This service is helping us meet the needs of the entire community."

Wagner, who's been working on the project since 2005, and who's currently part of a team developing composting toilets for the project, says the key lesson she has taken away is securing local involvement. "You have to get input from the community," she said.

Today, the project is nearing its end, and Muñoz expects water to flow this summer. Reflecting on the outcomes, he views the project as a win-win for all concerned. The village will have a potable water supply and sanitation system that they can maintain on their own. The 25 Mines students who have been involved in the project come away with an invaluable learning experience. And an important cross-cultural exchange of ideas and knowledge has taken place. M

Alumnus arranges donation of 27 miles of pipe 'Felt like the right thing to do'

When David Chasis, a 1961 Mines geological engineering graduate, heard about Mines' work on a water purification and sanitation system for a remote village in Honduras, he knew he had to help.

"It just felt like the right thing to do," says Chasis, president of Chasis Consulting Inc., a firm specializing in plastic fluid handling systems in Austin, TX.

After talking with David Muñoz, associate professor in Mines' Division of Engineering who heads up the effort, Chasis assisited in arranging for pipe, fittings, valves and cement worth over $125,000 to be donated by 11 companies, all members of the Plastic Pipe and Fittings Association.

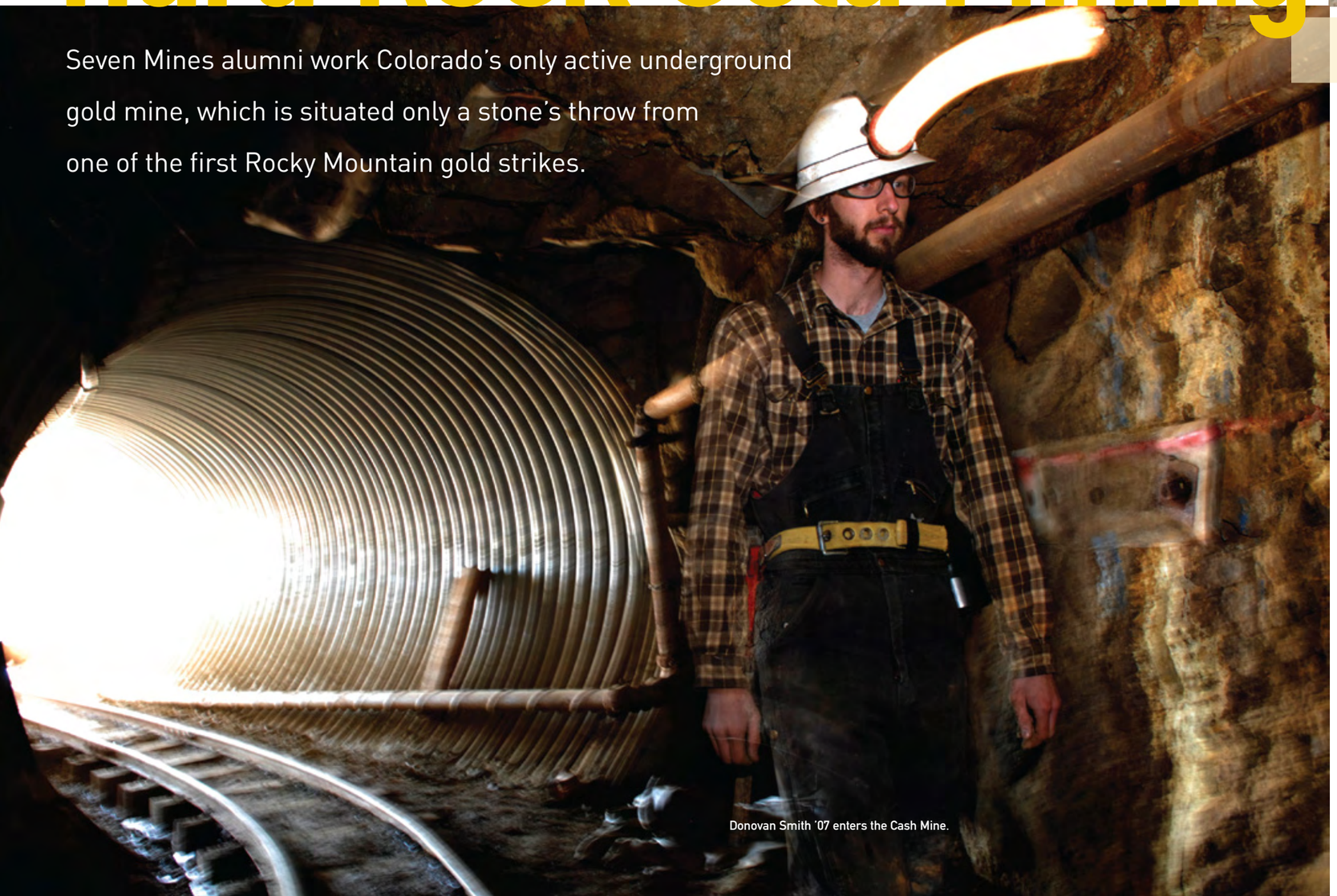
Chasis also helped arrange for a supervisor to visit the site and help install the pipe. "I feel opening students' minds to the basic needs of communities throughout the world is priceless and very worthwhile," Chasis says.

The Honduran project is part of Mines' humanitarian engineering minor—a program that was funded for its first five years by the William and Flora Hewlett Foundation. The Hewlett funding runs out this year, however, and additional funds are needed to complete the Colinas de Suiza project mentioned in the adjacent article. For more information on how you can support Mines' humanitarian engineering program or to request a compelling DVD about the program, please call 303.273.3658.

By Nick Sutcliffe and Brendan Harrington, Photography by Brendan Harrington

Hard Rock Gold Mining

Seven Mines alumni work Colorado's only active underground gold mine, which is situated only a stone's throw from one of the first Rocky Mountain gold strikes.



Donovan Smith '07 enters the Cash Mine.

Courtesy of Gold Hill Store & Cafe

The phone on the office wall is a dedicated line to the working mine hundreds of feet below our feet. When it jangled to life during our interview, Branden Burden '05 jumped for the receiver. It wasn't an emergency, and since he's been at the Cash Mine in Boulder County, they've never had an emergency, but the possibility weighs on him. "I hate it when that phone rings," he said, returning to his seat.

Burden is the mine engineer for this Mount Royale Ventures mining operation situated 10 miles west of Boulder. Of the 33 employees there, seven are Mines alumni. Matt Collins '04 is the mine manager; his wife, Lina Collins '07, is the environmental engineer; Chris Emanuel '05 is the mill engineer; Jim Paschis '73 is their geologist; Donovan Smith '07 is the associate mine engineer; and Murray Watts '68 is the engineer responsible for core drilling.

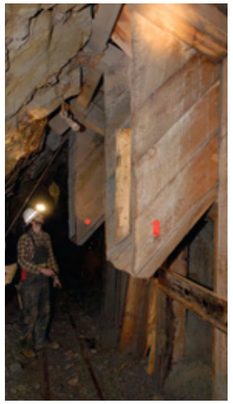
Cash Mine is currently Colorado's only active underground gold mine. Located at 8,500 feet on a hill overlooking the historic mining town of Gold Hill, it is also just a stone's throw from one of Colorado's earliest gold discoveries, the Gold Run strike of 1859. Since it was patented in 1872, the mine has remained operational much of the time, and consequently it is a treacherous labyrinth of vertical shafts and drifts (horizontal tunnels), many of which aren't mapped. "Small mining is very different," Burden says. "There's a lot of risk involved."

The company is close-knit with a sense of family that levels distinctions across the organization. Smith, who now oversees underground safety systems, jokes that perhaps his most important job of the day is showing up at 5:30 every morning to light the wood stove in the miners' dry room. And when there's a need, they all pitch in. "It's more than just a job for us. We all get down and dirty from time to time to help each other out," Burden says, describing how engineers sometimes fill in as miners or welders. New engineers joining the mine complete a rotation, working on every aspect of the operation before settling into their specific job.

The strong sense of community within the company is echoed in their relationship with the neighboring community of Gold Hill (pop. 220). Burden is a volunteer on the Gold Hill Fire Department, as are several other employees. They encourage locals to walk the trails on the mine's 455 acres of land at the edge of town. And the children at the Gold Hill Elementary School know Burden: once he led the 26 students on an afternoon walk to explain the dangers of playing around old mines (the hills are riddled with abandoned shafts); another time he went to the school to teach Civil War history dressed as a Confederate soldier.

Matt Collins also maintains ties to the Colorado School of Mines Mining Engineering Department. He encourages students from the department to visit and welcomes interns. Collins believes a small mine with a small

Left to right: Brandon Burden '05, Matt Collins '04, Lina Collins '07, Chris Emanuel '05, Jim Paschis '73



staff can offer a breadth of experience that students won't get in a larger operation. Smith, who first came to the Cash Mine to visit a friend interning there, found it so much to his liking that he left with a job: "Coming out of school, I wanted something smaller," he explains.

In the near future, Collins wants his team to break new ground on another front. Protective of their local environment, he wants the Cash Mine to reach a point of zero-waste. They already follow a rigorous set of environmental protection standards. For example, all excavated material that could leach harmful minerals into nearby waterways end up in their double-lined tailings pond. And starting this summer, he plans to begin putting tailings back underground and to use the remaining excavated materials to improve infrastructure. Collins is proud of these safeguards. "Our environmental controls are almost certainly more advanced than any small mining operation in Colorado," he says.

While striving to protect the environment around them, their main focus is on finding gold. To do this, they are digging new tunnels in the mountain, following what look to be promising veins. The original Cash Mine consists of nine levels and is approximately 750 feet deep. Mount Royale Ventures has entered from the side of the mountain, at level three, and is currently mining upward. Their strategy will be to clean out all of the higher levels before digging any deeper.

One of the biggest challenges they face is relearning the art of highly selective narrow vein mining. The technique involves mining vertically up through a vein, but it has been out of use for so long that one of their best sources of information is a manual written in 1918. "There are only a handful of people alive who know how to do this, and we're employing most of them," Burden says with a laugh, holding up the book.

After two years of development and preliminary work, the actual mining of gold ore began just last fall, and now the real challenge is underway. Digging new tunnels in an old mine is a risky business and, as they dig, the crew is finding old workings that aren't always mapped. Cautious of cracking a watercourse, which could flood the mine, they work carefully, placing new timber and track as they go and building their ore chutes where they find productive veins.

Currently, they pull 50 tons of ore from the mine each day—a very small operation in the world of mining. The material is processed onsite in the mill to concentrate the ore, after which it is placed in huge bags and trucked to central Mexico to be smelted. They are averaging about three quarters of an ounce of gold per ton of rock extracted, which is up from last fall when they were getting a tenth to half-an-ounce per ton.

Careful analysis and modeling is one way they are improving results. The richest ore is found in a one-foot-thick, almost vertical vein that runs through the mountain. Each time they blast inside the mine, they take samples, assay the rock and add the information to a growing database. The database plots results on a three-dimensional model of the mine, and Collins has written algorithms to interpret trends in the vein and project where they will achieve the best results. Just a few weeks ago, he zeroed in on a new area to mine and found it was directly beneath a stope that had been mined decades ago with considerable success. "That was an 'aha' moment," says Collins.

While they use plenty of state-of-the-art technology, they also have some antiques in operation. Their primary and secondary crushers were built in the 1920s (replacement parts are scavenged or custom-made); at the face they use jack leg drills introduced in the 1930s that run on compressed air; and explosives are still detonated with fuses that burn. "They are safer," Burden explains. "With all the lightening we get up here, you don't want to start wiring up electronic fuses."

Their old equipment and the history of the area reinforce a sense of connection Collins and Burden feel to the past. "I'd like to see how this place looked 100 years ago," Burden says. "To see what the town looked like and how they worked." And he wonders what kind of life his counterpart engineers at the Cash Mine led. What were their hopes and dreams? What did they achieve? Where did they come from? What would they think if they saw the mine today? And if they met, what would they talk about?

It would be a fascinating conversation to be sure. The differences would be many, but so would the similarities. In fact, there's a good possibility they would have graduated from the same university. M

The Network

Dear Alumni:

As president of the Colorado School of Mines Alumni Association Board of Directors, I consider it a privilege to be associated with the rich traditions of Mines and all that this special university represents. And I am especially proud to serve such a vibrant group of alumni.

The Alumni Association is a great source of strength for Mines. By strengthening relationships between graduates and the School, we support Mines' noble mission and promote excellence; and by building community among alumni, we foster a rich network of personal connections.

As we reflect on a particularly dynamic year at the Alumni Association, I wanted to share a few highlights:

1. **Reunion 2008:** This year we launch the Golden Miner Reunion, which welcomes all classes who have passed the 50-year mark to come back to campus and reconnect with friends on an annual basis. Reunion program highlights include a symposium entitled "Our Energy Future"; a luncheon featuring a speech by Tim Marquez '80, donor of Mines' largest-ever individual gift; a graduation and alumni banquet featuring Nobel Laureate in Physics James Cronin; an all-class BBQ; and the ever-popular class dinners.

2. **Student Support:** Through the generosity of Alumni Association members, 14 students were beneficiaries of Legacy Grants this year and several others received Field Session Grants. We also assisted the enthusiastic staff of *The Oredigger* with exposure to their online version (if you'd like to receive it, please give us your email). And our mentoring program continues to build momentum, as you can read on p. 34. Our next objective in this area is to launch a Student Alumni Association—more on that later.

3. **Personal and Professional Development:** We continue to offer opportunities on and off campus in this area. Notably, we recently drew a standing-room-only crowd of students and alumni to the event, "Lessons in Leadership: Advice You Can Use," which featured a panel of four highly successful alumni who answered questions about the values, strategies and personal characteristics that contributed to their accomplishments.

4. **Communications:** Several communications initiatives are underway. A new online community is in the works. Along with providing a more flexible alumni directory, it will also enable chat rooms/forums, blogs and much more. The Alumni Association website is going to be completely revamped; this will be done in concert with a completely revised School website. And lastly, *Mines* magazine was recently transformed and an online version launched.

As a distinct nonprofit organization, you might wonder how the Alumni Association funds these programs. Simply put, with your generous support. *Thank you.* Many have responded to our focus on membership growth: we now have 548 life members, double the number we had three years ago; and we had a strong response to annual membership this year, with many members choosing to include additional gifts with their dues. As of March 2008, we have 5,199 total members. Additional revenue has been harnessed in several other areas. For example, our new and traditional golf tournaments have enthusiastic support. And as you may have noted, *Mines* magazine has increased its number of advertisers considerably.

I'd like to close by once again saying thank you for your continued interest in, and support of, the Alumni Association and the School. Mines is a wellspring of talent and creativity in our increasingly technology-dependent world, and I am very proud of my association with the School. I hope you share these sentiments and will continue to support our mission with your membership. If you are not currently a member, I'd like to ask that you consider joining. A strong and dynamic Alumni Association provides opportunities for all of us to cultivate old and new relationships, connect with Mines in meaningful ways, and support our alma mater. We have created a great deal of positive momentum, but it must be fueled with our collective support.

We look forward to hearing from you. Go to http://www.alumnifriends.mines.edu/ for additional information or contact csmaa@mines.edu.

Sincerely yours,

Eric M. May '99
CSMAA President

Betas Getting New Digs

The Beta Phi Chapter of Beta Theta Pi celebrates 100 years at Colorado School of Mines this fall. To commemorate the occasion, the Betas are constructing a new state-of-the-art chapter house to be opened in September, and many alumni of the fraternity will be returning to campus to celebrate the occasion. The fraternity was initially begun as The Gastronomic Criterions in the early 1900s, and the Beta Phi's affiliation with Beta Theta Pi was officially recognized in 1908. Fundraising for the facility has been ongoing for the past seven years, and the hard work has now paid off, with construction at 1701 W. Campus Road well underway. The Centennial Celebration marking the historic 100-year milestone for the chapter and the opening of the new building will take place September 19–21, with a variety of activities planned (more information available at http://www.betaphialumni.org, or contact **John Green** '91 at jggreenjr@yahoo.com). All Beta alumni are invited to attend.

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Mentors Illuminate Life-Changing Decisions

Bill Wilson '65 and Felicia Blush, who is midway through her doctoral program in material science, have been with the Mentoring Program since it was launched.

With only a month to go before graduation, a handful of seniors are still wrestling with what they are going to do after graduation. A few months ago there were many more in this predicament. Decisions are hard, especially when they must be made with little information about what the consequences will be.

Thanks to dedicated alumni around the country, students enrolled in CSMAA's Mentoring Program received a little help with those tough choices this year. And by all accounts, it's a win-win deal for all concerned—mentors convey how gratifying it is for them to help current students, and the students report that the insights about their future professions are invaluable.

The CSM Alumni Association launched the program in 2005, with the aid of Brandon Segura and Joe Mahoney (both current members of the Alumni Association Board of Directors). Segura came forward with the idea while still a senior at Mines. He saw the opportunity to put students in touch with industry veterans, who were in a position to inform students' career choices. To this end, he worked with the Alumni Association staff and board members to create the Mentoring Program. Now in its third year, the program has paired almost 50 students with alumni-mentors, and its 2008 goal is to connect at least 50 more.

Felicia Blush, a doctoral candidate in material science, was paired with **Bill Wilson** '65, who has decades of experience in the materials industry. "Bill was a great conduit into private industry," she said. "He helped me make some professional contacts and gave me all kinds of good advice. And it wasn't just professional advice." Watching Bill and Felicia talk, it is clear that a meaningful relationship has evolved, and it's not one-way. "I like being back on campus," said Bill. "I have a lot of industry experience and knowledge to share, and I enjoy being with students because I learn from them as well."

Other mentors echoed these sentiments. "Becoming a mentor really allowed me to come full circle as a former student and Mines alum," said **Mahesh Vidyasagar** '00. "I was able to connect with a new generation of students who wanted the same things out of a Mines education that I did when I attended. During the process, I found that the relationship I had with my mentees was mutually beneficial. I appreciated learning from them while they learned from me."

Mentors frequently help students to get a head start on industry networking. Sometimes they also help students clarify their life goals and create structure for achieving them. **Craig VanHorn** '06 is a graduate student studying metallurgical and materials engineering. He meets regularly with his mentor and repored, "He has really helped me figure out what I love to do." **Stephanie Schmidt** '07 says her mentor "has really helped me…figure out what I want to do and where I want to go." One former student was even helped through the process of purchasing her first home by her former mentor!

The Mentoring Program is always looking for alumni who are willing to mentor a student, and students who are looking for a mentor. If you are interested in learning more about the program, please contact Serena.Stickney@is.mines.edu.

For more information:
http://www.alumnifriends.mines.edu/Alumni/csmaa_mentoring_program.htm

An E-Days Retrospective

While the fireworks went off in Golden on April 3, 2008, over 350 alumni around the world raised their glass to Mines in celebration of E-Days! It is truly one of the most fondly remembered Mines traditions, and E-Days 'Round the World drew Miners together in locations from Antarctica to Anchorage, and many places in between.

The first E-Days, or Engineers' Day, celebration at Mines was on January 29, 1927, when Mines was a very different place. Students could specialize in one of only four academic "options": metal mining, metallurgy, geology and petroleum engineering. And the School operated from four main buildings: Guggenheim Hall, Stratton Hall, Chauvenet Hall and the Hall of Engineering. In the spring of 1927, 65 seniors graduated from Mines.

The event was organized by the Colorado Engineering Council and was intended as a day of entertainment for engineers and engineering students across the state. A Mines committee, which included Melvin F. Coolbaugh, made the campus arrangements. Activities included talks given by council engineers in Guggenheim,

E-Days 'Round the World celebrations took place in the following locations:

Albuquerque, Atlanta, Anchorage, Bangkok, Bend, Boston, Brisbane, Burlington, Butte, Calgary, Casper, Colorado Springs, Dallas/ Ft. Worth, Denver/Golden, Ft. Collins, Glenwood Springs, Golden, Grand Junction, Honolulu, Houston, Kuala Lumpur, Lagos (Nigeria), London, Malaysia, Los Angeles, Minneapolis, Moscow, Oman, Palmer Station (Antarctica), Parker, Perth, Philadelphia, Raleigh, Reno, Salt Lake City, San Antonio, San Diego, San Francisco, Seattle, Singapore, Spokane, Tokyo, Tulsa and Washington, DC.

campus tours, a basketball game with the University of Wyoming, and a dance sponsored by the sophomore class.

Eighty one years later, E-Days has evolved into a weekend of merriment and traditional competitions, including the tricycle race, arm wrestling, beer Olympics and cold spiking competitions. One thing that has remained the same throughout all E-Days celebrations is that the weekend starts with a spectacular fireworks show—the best in the state.

CSMAA launched E-Days 'Round the World in 2006 as a way for alumni in various regions to gather, get to know each other and reminisce about their days at Mines. Credit for the success of this event goes largely to our group of energetic volunteers around the world who call and rally enthusiasm. To see photos of this year's gatherings, go to http://www.mines.edu/magazine. If you want to volunteer to organize a gathering next year, email Serena.Stickney@is.mines.edu.

Scoggins Attends Regional Receptions

President Bill Scoggins and his wife, Karen, greeted alumni and friends in Washington, DC, Oakland, Palo Alto and Grand Junction last fall and in Houston and San Diego in early 2008. At each event Scoggins took the opportunity to update alumni and friends on recent events at Mines.

He spoke of the recently formed Nuclear Engineering and Biochemical Engineering programs, and provided an update on capital needs and improvements. He also discussed our ongoing relationship with the Petroleum Institute in Abu Dhabi, pointing out that 17 percent of students at the PI are now women.

Scoggins outlined some administrative changes, including Nigel Middleton's recent appointment as provost and senior vice president for strategic enterprises. Middleton will be responsible for promoting international collaborations with governments and private industry, as well as developing strategic alliances with federal laboratories, corporations, and other federal and state agencies.

Changing student demographics were addressed. The president pointed out that enrollment this year is approximately 4,250, reflecting the increased interest in a Mines education. Increased enrollments are also putting pressure on classroom and lab space and increasing the need for additional student housing on campus—priorities that he believes will need to be addressed in the coming years.

For details about upcoming regional events in 2008, call Serena Stickney at 303-273-3290.

Approximately 160 alumni gathered at the Houstonian in downtown Houston on January 10. This photo includes (left to right) **Harry Briscoe** '71, MS '72, **Charles Russell** '54, **Dean Stoughton** '75, MS '78, Bill Scoggins and **Bob Manelis** '82.

Miners Attend Marine Ball in Oman

In Muscat, Oman, a group of alumni attended the 232nd US Marine Corps Birthday Ball on November 14, 2007. Pictured from left to right are **Glenn Vangolen** '81, **Tracey Vangolen** '83, **Tom Walker** '89, **Mark Reeves** '90, **Donnie Enns** '82 and **Ross Macfadyen** '89.

2008 Reunion | May 7-10, 2008

Honoring the following classes:

The Golden Miner Classes (Classes 1935-1957), 1958, 1963, 1968, 1973, 1978, 1983, 1988, 1993, 1998, 2003

And welcoming back their neighboring classes:

1962, 1964, 1967, 1969, 1972, 1974, 1977, 1979, 1982, 1984, 1987, 1989, 1992, 1994, 1997, 1999, 2002, 2004

Online registration is open for Reunion 2008! Visit www.MinesOnline.net where you will be able to

- View the events schedule for Reunion Weekend
- Register for events – and see who has signed up so far!
- Define what other alumni can view on your personal member page (post photos and text)
- Search for friends or fellow alumni by name, city, degree, occupation and more
- Reconnect with classmates through user-friendly message boards, chat, friends list, instant notes and who's online features
- Buy Mines apparel from the new merchandise store
- Order your class reunion photo
- And more!

We will be rolling these features out incrementally through the spring and summer, starting with Reunion 2008 registration. Check back soon to see our progress!

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Or contact

Marv Kay '63
National Reunion Giving Program Chair
303.273.3363
Marv.Kay@is.mines.edu

Alexis Bloomfield
Major Gifts Officer
303.273.3144
Alexis.Bloomfield@is.mines.edu

HOW HAS YOUR MINES EDUCATION SHAPED YOUR LIFE?

Maybe you benefited from Mines' personalized academic environment. Perhaps you gained relevant technical knowledge. In one way or another, your Mines education has enhanced your success and quality of life.

A reunion gift to The Mines Fund carries on the unique Mines experience for generations of future students. Let's join with our classmates to support the enduring value of a Colorado School of Mines education.

Marv Kay '63

Fast Forward

Class Notes
Weddings
Alumni Profiles
Births
Passings

1943

Richard W. Deneke is retired and lives in Stone Mountain, GA.

1947

David B. Mazer turned ninety in December 2007.

1950

Clyde W. Kerns is retired and lives in Lubbock, TX.

1951

E. Geoffrey Jeffreys is enjoying life. His health is good. He is staying busy and having a ball. He wishes everyone the same.

Robert B. Owen is president of RBO Inc. in Corpus Christi, TX.

1952

Michael Alexander is a consultant for IGC in Houston, TX.

Richard D. Wendeborn and his wife "D.A." celebrated their 50th wedding anniversary this summer. Their five children, their spouses, and their 16 grandchildren joined them for the celebration.

1953

Keith D. Jung is retired and living at Mammoth Lakes, CA. He is active with the town and serves on advisory committees and advocacy groups. He also keeps busy hiking, backpacking, fishing and stream surveying.

1954

Carl L. Blazel is a partner of Information Management Services in Honolulu, HI.

1955

Chester L. Love is an independent petroleum consultant in Bakersfield, CA.

1956

Ralph H. Dougherty is president of Dougherty & Associates in Charlotte, NC.

1958

Gregory C. Meyer is retired and lives in Wheat Ridge, CO.

1959

Gene A. Burrell is president of Burrell Engineering in Fruita, CO.

Lary G. Cahill is retired from ASARCO Incorporated and lives in Golden, CO.

Maurice A. Chaffee retired in 2000 from the U.S. Geological Survey but continues to work there as a scientist emeritus. He writes, "My current research involves applying trace-element geochemistry to environmental issues in the western U.S."

Peter A. Rutledge is retired and lives in Lakewood, CO.

Lowell I. Thomas is retired and lives in Coquille, OR.

1960

James F. Green, Jr. is president of Green Brothers, Inc. in Fort Morgan, CO.

William R. Sandifer II writes, "I am semi-retired after 30 years in the guest ranch business and 30-plus years in land development, creating residential developments in Jefferson, Clear Creek and Gilpin counties in Colorado. My wife, Marilyn, and I enjoy winter vacations at our home in Ft. Lauderdale and trips on our boat in South Florida. We recently celebrated our 42nd anniversary."

1962

Stephen J. Force teaches grade school math and English at the Our Merciful Savior after school program. He lives in Lakewood, CO.

Terry G. Lenz is a retired emeritis professor of chemical engineering at Colorado State University.

1963

Phillip M. Beatty is an executive coach for the Axiom Group in Bixby, OK.

Donald W. Bennett is an entreprenuer's coach for the Idaho Small Business Development Center. He lives in Couer d'Alene, ID.

1964

Terry L. Campbell is currently working with an oil company to put together a uranium exploration/mining company, after working for former U.S. Senator Jim Talent in Missouri for four years.

Harold C. Capshaw III is retired and living in Claremore, OK.

1965

C. Michael Oldenburg is an operations manager for Solana Petroleum in Bogota, Colombia. His home is in Golden, CO.

E. Avery Reed is owner of Griffith Company in Santa Fe Springs, CA.

1968

Donald L. Bryson retired from Pioneer Natural Resources on March 1, 2008. He lives in Denver, CO.

Edward O. Church is president of Church Onsite Wastewater Consultants in Wheat Ridge, CO.

Joe W. Gray is a biomedical scientist and division director for Lawrence Berkeley National Laboratory in Berkeley, CA.

1969

Dale R. St. Laurent is retired and lives in Rowlett, TX.

1971

W. Craig Blasingame is vice president of product development for Mergellina Designs Inc. in San Bruno, CA.

Wesley P. Nason is vice president of pipelines for CH2M Hill, Inc. in Anchorage, AK.

1973

Brian L. Evans is vice president of sales for JMV Services, Inc. in Dallas, TX.

Louis D. Jensen is retired and lives in Colorado Springs, CO.

Weddings

Brian Garrison '01 married Anne Herscher on Maui, HI, on January 8, 2008.

Martin P. Schmidt '07 and **Stephanie E. Ashley** '07 were married on August 12, 2006 at the Church of Jesus Christ of Latter-day Saints in San Diego, CA.

Jamie Frisch '98 and **Michael Stringfield** '98, ME '01 were married on September 1, 2007, in Kickapoo, IL. Mines alumni attending included **Krysta Coffey** ME '98, **John Johnson** '97, ME '99, **Morgan Sykes** '98 and **Kirk Roberts** ME '98.

John E. Lee III is attorney of counsel for Wright & Associates, PC in Edmond, OK.

Gregory K. Staff is senior project manager for Plains All American Pipeline, LP in Houston, TX.

1974

Michael J. Bertoldi is a mine engineer for Morton Salt in New Iberia, LA.

Kenji C. Farinelli is a project manager for Lockheed Martin in Colorado Springs, CO.

James L. Schlabaugh is retired and lives in Dolores, CO.

1975

Robert M. Baldwin is a professor and ARAMCO Chair in Chemical Engineering at the King Fahd University of Petroleum and Minerals in Dhahran, Saudi Arabia.

Thomas L. Breninger has been promoted to operations superintendent for Permian Basin Operations for Marathon Oil Company.

H. R. Klingensmith is founder, CEO and president of Stone Mountain Resources LTD, a private oil and gas company in Calgary, Alberta, Canada.

1976

Nancy S. Alexander has resumed her career and is a senior geophysicist for William M. Cobb and Associates, Inc. in Dallas, TX.

Steven R. Gasser writes that he has been with ASARCO, Inc. for 31 years. Currently, he is hot metals manager for the Hayden Smelter in Hayden, AZ.

W. Dennis Gibson is general manager for Mitsubishi Materials USA Corporation in Statesville, NC.

James C. Laughry has moved from Landmark Graphics and is now an exploration geophysicist for the Newfield Exploration Company in Tulsa, OK.

1977

James I. Breninger is a senior geophysicist for Venoco Inc. in Denver, CO.

James L. Cornellisson is senior loss control representative for Continental Western Group. He also is a certified safety professional and lives in Thornton, CO.

Kevin Wayne Patterson is advisor and subject matter expert—IPSO for Chevron International Exploration & Production in Duri, Riau, Indonesia.

Marcus P. Randolph is group executive and chief executive of ferrous and coal for BHP Billiton Ltd. in Melbourne, Victoria, Australia.

R. Gordon Schupmann is manager of process engineering for Uni-Cast in Londonberry, NH.

1978

John H. Benton is manager of the Western Business Unit for El Paso E&P in Denver, CO.

James J. Moore is techncial director of mining and processing engineering for General Moly, Inc.

1979

Joseph D. Achierno is project development director for North Africa for Dow Chemical Co. in Terneuzen, the Netherlands.

Alan J. Mencin is senior vice president for Catalyst Ventures. He lives in Golden, CO.

Anthony M. Meyers is director of engineering support for Luminant Mining in Dallas, TX.

Andrew J. O'Conor is vice president of Millennium Partners, LP in New York City, NY.

Douglas E. Thomas is an independent geophysical consultant in Montville, ME.

1980

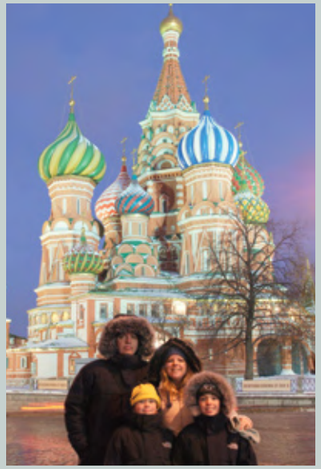
Terry L. Mead is a GRTI - support manager for Schlumberger, Ltd. in Denver, CO.

1981

Nicholas W. Atencio is chief operating officer for Remora Energy Management, LLC in Houston, TX.

Profile

Securing the Network, US Embassy Moscow



The Moreno Family at St. Basil's Cathedral, Red Square, Moscow. Left to Right: Jose, Daniel, Tracy, Alex

Jose Moreno '96 sometimes ends his day with a stroll through Moscow's Red Square, perhaps picking up cup of tea on the way. Although at six dollars a cup, he admits it's a fairly rare treat. Jose is now in his eighth month working at the U.S. Embassy Moscow as a security engineering officer. When Jose first applied to the State Department, he was looking for an exciting job that would enable him to travel. He's clearly fulfilled the travel objective. And with U.S.–Russian relations getting downright chilly, there's plenty of excitement too. "It's a tense place, especially during elections," Jose says. "Leadership approval ratings go up when a tough stance is taken toward the West, which makes the mission more challenging." From his office, Jose looks directly at the Russian White House where the new president, Dmitry Medvedev, has his office, and where Putin will soon move in (and where anti-Yeltsin protesters were shelled in 1993). "It's really quite captivating the way there's always a clear sense that the two governments are watchful of each other," Jose remarks. For an upcoming visit from both U.S. Secretary of State Condoleezza Rice and Secretary of Defense Robert Gates, Jose's department will be providing technical security and support for their hotel and the high profile meetings.

While Jose's professional life may seem a little outside the norm, his family life is quite down to earth. His wife, Tracy, is a teacher. His two boys, Alex (10) and Daniel (8), attend the Anglo American School. Their social life revolves around work and their children's school. "We take the kids ice skating at Red Square, swimming on the compound and for walks through this lively city of approximately 12 million. There is plenty to do," he says.

Moreno began his technical career soon after high school while he was in the U.S. Army. "I scored high in the electronics portion of a standardized test, so I was sent to technical school in Georgia to study avionics and then to Germany to work on Apache helicopters," he said. After his tour of duty, he came to Mines by way of Front Range Community College, graduating with a degree in electrical engineering in 1996. He worked in Arizona for Lucent Technologies and then General Dynamics before applying for the position with the State Department. His first posting took him to Washington, DC, to work on network security. When the opportunity to go to Moscow came up, he jumped at the chance. Ironically, Jose was in Germany when the Berlin Wall came down. "I literally helped chisel it down," he chuckles. "At the time, the idea of working in Moscow in an era of tremendous change and peace was only something to contemplate. Now we're living it and the challenge is to keep those walls down." Jose is keen to point out that the State Department has lots of opportunities for engineers. "They seem to be recruiting at Texas A & M for some reason and I'd like to change that," he jokes. Rotations take place every two to three years, so the job provides a truly global experience. For information visit www.state.gov.

Eric F. Hadsell is owner of P.O.E. Inc. in Lodi, CA. His recently opened oil and gas consulting firm serves clients in California and the Rockies.

Martin W. Sharps is a consulting geophysicist for Chevron Thailand, Ltd. in Bangkok, Thailand.

1982

Daniel W. Andrews is product manager of mining chemicals for Borregaard Ligno Tech in Littleton, CO.

John P. Ansted is principal of J.P. Ansted & Co., LLC, in Littleton, CO.

Felipe E. Audemard is advisor for Schlumberger, Ltd. in Villahermosa, Tabasco, Mexico.

Scott K. Burkholder is a senior geophysicist for Ascend Geo, LLC in Golden, CO.

Winthrop D. Childers is president of WDC Patents in San Diego, CA.

Roger M. Flahive is managing director for SB Energy Partners in Denver, CO.

Eric J. Lauber is manager of technical services for Western Refining in Bloomfield, NM.

Charles E. Lienert is retired and lives in La Junta, CO.

Thomas A. Neville is a partner for PetroCap in Dallas, TX. He lives in Menlo Park, CA.

Brian C. Savage is chairman and CEO of Frontier Mining Ltd. in Centennial, CO.

Kevin A. Sparks is a principal process engineer for Metabolix in Cambridge, MA.

Bruce A. Tunget is a drilling manager and consultant for Endeavor Energy. He lives in Westhill, Aberdeenshire, UK.

1983

Mark A. Balderston is completions supervisor for EnCana Oil & Gas, Inc. in Parachute, CO.

Margie (Spoo) Collins is a senior consultant and a CPA in forensic and litigation consulting specializing in construction and government contracts for FTI Consulting, Inc. / Rubino & McGeehin Consulting Group in Bethesda, MD.

C. Thomas Heinzler is general manager of midstream business for Anadarko Petroleum Corporation in The Woodlands, TX.

Neal P. Mares, Jr. is a senior operations engineer for Swift Energy Operating LLC in Houston, TX.

Steve E. Milligan is an independent consultant in Fayetteville, AR.

Thomas S. Turner is a a drilling manager for Occidental Oil and Gas Corp. in Bakersfield, CA.

Janine F. Weber is a senior engineering geologist for ENGEO Incorporated in San Ramon, CA.

1984

David M. Bagley was appointed department head, Department of Civil and Architectural Engineering, University of Wyoming in August 2007. This is a four-year appointment.

Todd R. Frauenhoff is software architect principle for Lockheed Martin Corporation in Denver, CO.

John R. Guffey spent three wonderful years in Morocco and has been in Vietnam one year. He is a drilling engineer specialist for Cuu-Long JOC in Ho Chi Minh City, Vietnam.

Howard L. Holden is manager of metallurgy for Quadra Mining Ltd. in Vancouver, BC. He lives in Moab, UT.

Michael J. Kendrick is vice president of technical services for Climax Molybdenum Co – Freeport McMoRan in Phoenix, AZ.

Jeffrey P. Lee is chief, consequence management, for the Defense Threat Reduction Agency in Fort Belvoir, VA.

Robert S. Michel is president and owner of Flying Toolshed in Asheville, NC. He specializes in using the power of ideas in groups to solve problems and develop strategic plans.

R. Scott Tracy is a director for Sun Microsystems, Inc. in Broomfield, CO.

Brenda J. Wolfe was promoted to North American sales manager, process equipment business line, for Metso Minerals Industries in Colorado Springs, CO.

1985

Thomas C. Anderson is a project engineer for Oxbow Mining, LLC in Somerset, CO.

Michelle A. Brown is a live sports operator for Comcast.

Brian E. Donovan is assistant general counsel for Venoco Inc. in Denver, CO.

Javier Luengo Delgado is a project manager for Hidroproyectos S.A. He lives in Guatemala City, Guatemala.

Steven D. Nash is reservoir engineering manager for Anadarko Petroleum Corp. in Denver, CO.

Nick T. Starika is vice president of Jacobs Technology in Dumfries, VA.

Patrick S. Troyer is director of Gulf Coast Supply for Valero in San Antonio, TX.

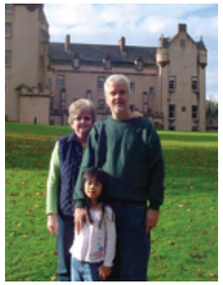
1986

Rachmat A. Abdoellah is vice president of planning, reserves, technology and operations support for Chevron Indonesia Co. in Jakarta, Indonesia.

Nathaniel E. Putzig is a research scientist for Southwest Research Institute in Boulder, CO.

Franciscus B. Sinartio is a geophysical consultant for EP Engineering in Kuala Lumpur, Malaysia. He lives in Tangerang, Banten, Indonesia.

Joseph F. Titzer is general manager of Natco Al Rushaid Middle East Ltd. in Al-Khobar, Saudi Arabia.



Jeremy Zimmerman has relocated with his family to Aberdeen, Scotland. This picture was taken outside Fyvie Castle in Aberdeen and includes Jeremy, his wife, Sharon, and their daughter, Anna. He continues to work for Chevron as a staff geophysicist.

1987

Julie L. Bader moved to Redding, CA in June 2007 with her husband and three daughters (4, 7, and 9). She works for the Mid-Pacific Region, Bureau of Reclamation, Department of Interior as an electrical engineer in Sacramento, CA.

Tina Faraca has recently been appointed president of Maritimes & Northeast Pipeline, a subsidiary of Spectra Energy based in Houston, TX.

Craig F. Horlacher is principal geologist for Pincock, Allen & Holt, Inc. in Lakewood, CO.

Ronald A. Smith is a senior control systems engineer for Tighe & Bond Inc. in Westerfield, MA.

1988

Juliene M. Benson is chief financial officer for ENERGYneering Solutions, Inc. in Bend, OR.

Gregory L. Griffitt is branch chief for AFRICOM in Stuttgart, Germany.

Richard C. Lansdowne is a senior mine engineer for Robinson Nevada Mining Company in Ruth, NV.

Brian C. Tripp is an associate professor in the Biological Sciences Department for Western Michigan University in Kalamazoo, MI.

1989

Ahmad Sapian Abdul Latif is a senior drilling engineer for Newfield Peninsula Inc. in Kuala Lumpur, Malaysia.

Thomas M. Haard is senior physicist for Johns Hopkins University Applied Physics Laboratory in Laurel, MD.

Mark J. Oberley recently took command of the *USS Winston S. Churchill* (DDG81).

Stephen J. Rule is technical director for M & J Drilling Services Limited in West Midlands, UK.

Gehrig S. Schultz is vice president, Eastern Hemisphere Operations, for PGS Onshore based in Walton-on-Thames, UK.

1990

Julia Hoagland is vice president of Corcoran Group, Modern Luxury Living Partnership, in New York City, NY.

1991

Michael J. Orobona writes: "After five years in the Northern Minnesota taconite (iron ore) industry and a short year at Cleveland-Cliffs' headquarters in Cleveland, Ohio, I am transferring to Cliffs' Australian asset, Portman Iron Ore Limited, for a two to four year

secondment. I'll be based in Perth, managing the generative and near mine exploration programs proximal to Portman's open pit operations at Mt. Jackson and Koolyanobbing in the Yilgarn of Western Australia. Relocating with me will be my wife Stacey, and our sons Thomas (8), Andrew (7) and Bennett (7 months). My home e-mail is mikeorobona@hotmail.com."

David G. Ray has just completed 15 months in Iraq as the operations officer for the 9th Engineer Battalion. He and the battalion have returned to Schweinfurt, Germany, to begin preparing for future combat operations.

Jeffrey S. Suiter is a subsurface project leader with Total SA in Beijing, China.

1992

Michael J. Carstens is plant manager for Archer Daniels Midland Company in Des Moines, IA.

Lorna A. Greening is market economist for Midwest ISO in Carmel, IN.

Thawin Kittikunsereekam is president of the Lee Mansion in Hatyai, Thailand.

Samuel A. Rasmussen is currently general manager working in the Democratic Republic of Congo on the Tenke Fungurume Mining Project.

Teresa A. Ross is vice president of finance for The Ross Group Construction Corporation in Tulsa, OK.

1993

Dean R.K. Bell is operations manager, Central Asia - Drilling & Measurements for Schlumberger, Ltd. in Atyrau, Kazakhstan.

Chadwin F. Cox is president of Western Engineering Consultants, Inc. in Brighton, CO.

Mary C. Griggs received her P.E. in 2003 and currently works for Science Applications International Corporation (SAIC) as a senior project manager/remediation engineer.

Christopher E. Price is a project manager for Castle Rock Development Co. in Denver, CO.

1994

Hisham A. Al-Siyabi is a senior exploration geologist with Shell Exploration and Production in Houston, TX.

Dean M. Armand is an account executive for Brocade Communications in San Jose, CA. He lives in Littleton, CO.

Hector L. Cruz is vice president of engineering for Westinghouse Plasma Corporation in Pittsburgh, PA.

D. Mike DeWig is a mechanical engineer for Henderson Engineers in Las Vegas, NV.

Andrew R. Freeman is regional sales manager for Calix in Petaluma, CA. He lives in Overland Park, KS.

Gillian L. Harrison is manager of marketing and support for BCR in Aurora, CO.

Kevin M. Moore is program manager for Jacobs Engineering in Golden, CO.

Eric Douglas Wilson is vice president of Integrated Companies, Inc. in Englewood, CO.

Profile

Grad Recognized with Two "Young Engineer" Awards

Travis Attanasio '02, who holds a bachelor's degree in civil engineering from Mines, has been named Young Engineer of the Year by the Fort Worth Branch of the Texas Society of Professional Engineers. He was also named the Fort Worth Branch of the American Society of Civil Engineers 2008 Edmund Friedman Young Engineer of the Year. Both awards recognize engineers under the age of 34 for contributions to public welfare and for advancing the profession of engineering. Travis is an active member of the Fort Worth Chapter of TSPE, where he currently holds the position of secretary of the board. He is also the finance chair for their MATHCOUNTS competition, which promotes interest in math among middle-schoolers. On behalf of his chapter, he visits area schools to speak about engineering: "Kids can really connect with the idea of building bridges for a living, so that's what I tend to talk about," says Travis. Community involvement has been a theme in Travis' life. At the age of 15 he joined his father as a volunteer firefighter for Inter Canyon Fire/Rescue. After getting state and National Forest Service firefighter certifications, he helped fight the Bear Track fire in 1998, and the Hi Meadow Fire in 2000, the latter of which burned 10,970 acres and destroyed 51 homes. He enjoyed the excitement of firefighting and at one point thought he'd make a career of it.

Working for A.N.A. Consultants in Fort Worth, Travis is focused on a different element—water. He's developed specialized expertise in water management and reuse—skills that have been in particularly high demand since last summer's floods. "Water fascinates me," he says. "We have equations that describe how it is supposed to behave, but it can be hard to really predict, particularly in drainage where there are often numerous variables. In that sense, it's a little like firefighting—trying to predict an outcome from a highly complex system." Travis has contributed to some high-profile projects in his region, including waterlines and sewer systems for the new Dallas Cowboys Stadium; detention ponds for Montserrat, a multi-million dollar residential subdivision in Fort Worth; and a $9 million Dallas Fort Worth Airport hangar drainage project that he personally secured.

Travis is married to Alison (Myers) '02, a software engineer working for Motorola, whom he met during his sophomore year. Without mountains to climb nearby, they enjoy exploring the lakes and estuaries of Texas in their canoe.

1995

Jeffery C. Dillon is a drilling engineer for Southwestern Energy Company in Fayetteville, AR.

Terry L. Nichols is a scientist for the Lockheed Martin Corporation. He lives in Golden, CO.

Edwin R. Peralta is a mining engineer for Mine Development Associates in Reno, NV.

Michael J. Vint is a senior consultant for Snowden in Vancouver, BC.

1996

Jason W. Goodall is programming lead and scrum master for Corporate Express in Broomfield, CO.

Nicholas F. Hernandez is senior directional drilling instructor for Halliburton in Houston, TX.

Vicki Alexander Hutson is senior CAE analyst for the The Shaw Group in Houston, TX.

Jose L. Moreno has been assigned as an engineering attache of the U.S. Department of State at the American Embassy in Moscow, Russia.

William H. Rowell III is an investigator for the U.S. Department of Justice in Detroit, MI.

1997

Scott S. Birkmire is a senior process engineer with BBI International in Denver, CO.

Michael M. Chen is president of Odon Construction Inc. in Kaneohe, HI.

Shawn E. Cheney is vice president and branch manager for Volvo Construction Equipment & Services in Elkridge, MD.

Susan E. Evers is a senior site manager for Genentech in San Francisco, CA.

Tyler K. Faulk is a major in the U.S. Army and lives in Seaside, CA.

Emily A. Gibson is an engineer for Psomas in Carlsbad, CA.

Valarie L. Salaz Hamilton is marketing manager Canada for CGGVeritas in Calgary, Alberta, Canada.

Joshua E. Pedigo has been promoted to regional area manager for Square D/Schneider Electric. Josh will assume general manager responsibility for the St. Louis Area (MO, IL, IA). He and his wife, Kate, and their two sons, Nate and Zach, will relocate from Nashville to St. Louis in the first quarter of 2008.

Derek T. Webb received his P.E. in 2007 and is currently a project engineer for Muller Engineering Company, Inc. in Lakewood, CO.

1998

Dawn M. Ambrosio is regional CI & Lean Manager for Veritas Communciations. She lives in Brighton, CO.

Duane J. Cleere is a project manager for PBS&J in Denver, CO.

Tenley R. Krueger is a patent attorney for T.R. Krueger, P.C. in Sugar Land, TX.

Hisyamudin Mohd Yusof is general manager for Intisari Oilfield Services Sdn Bhd in Kuala Lumpur, Malaysia.

Fernando H. Rodriguez is environmental safety and health director for Barrick Gold Corporation – South America, in Santiago, Chile.

Patrick D. Sandoval is a project manager for Worley Parsons in Houston, TX.

Lisa J. Schwien, P.E. is an engineer for Meurer & Associates in Lakewood, CO.

1999

Dawn D. Gaynor has moved with her husband Joe to Gaithersburg, MD and is a technical writer for Aptify in Washington, DC.

Christina J. Lynn is principal financial consultant for Xcel Energy Inc. in Denver, CO.

Vui Thi Nguyen is a senior software engineer for Raytheon in Aurora, CO.

Keith Y. Suga is a project manager for Goodfellow Brothers, Inc. in Koloa, HI.

George Tumur is executive director of Global Energy LLC in Ulaanbaatar, Mongolia.

2000

Brian A. Armstrong is an operations superintendent for South Carolina Electric & Gas in Beech Island, SC.

Justin D. Beaird is a bridge engineer for HNTB. He lives in Frisco, TX.

Keri H. Brill is a business management analyst for the Knoxville Utilities Board in Knoxville, TN.

Andrea M. Capra is a systems engineer for the Boeing Company in Renton, WA.

Aaron L. Giesick is a firemedic for West Metro Fire Rescue in Lakewood, CO.

Tiani Jones is a senior technical account manager for Translations.com in Denver, CO.

Matthew D. Lengerich is manager, expansion planning for Rio Tinto Alcan in Queensland, Australia.

Michelle M. (Moore) McCassey is a lieutenant colonel and logistics operations chief for the U.S. Army. She lives in Kailua, HI.

John J. Thurman is a project engineer for Morrison-Maierle in Tempe, AZ.

John Robert West is a geological engineer for URS Operating Services in Denver, CO.

Lana R. Wilson is an engineer for Hydrometrics, in Billings, MT.

2001

Forrest H. Buckner is director of high school ministry for the First Presbyterian Church of Boulder in Boulder, CO.

Matthew C. Douglass is director of technology for Practice Fusion in San Francisco, CA.

Brian Garrison married Anne Herscher on January 8, 2008, on Maui, HI. Brian and Anne reside in Milwaukee, WI, where Brian is a product engineer for Heraeus Electro-Nite and Anne is in the final year of her family medicine residency.

Devon A. Harman is a process engineer at the Ravensthorpe Nickel Operation for BHP Billiton Ltd. in Ravensthorpe, Western Australia.

Emily P. Troxell McGahee is an independent consultant in Saluda, VA.

Jennifer A. Kramb Rivers is an engineer for Straughan Environmental Services. She lives in Gaithersburg, MD.

Ross R. Volk received his J.D. from the Duke Law School in 2007. Presently, he is an associate attorney for Faegre & Benson in Denver, CO.

2002

Eric W. Boogaard is an account manager for Bosch Rexroth Corporation in Rochester Hills, MI.

Michael W. Eaton received his doctorate in materials science from the State University of New York at Stony Brook in 2007. Presently, he is a senior research engineer for the ExxonMobil Corporation in Houston, TX.

Dayven H. Johnston is industry mining manager for Caterpillar of Canada Corporation in Edmonton, Alberta, Canada.

Kate Slaga Kalikstein is an analyst for Kaiser Permanente. She lives in Lone Tree, CO.

Ryan S. Kircher is employed by Medical Modeling Inc. in Golden, CO.

Malia L. Miranda is a senior test and development engineer for PACCAR, Inc. in Mount Vernon, WA.

Matthew H. Pinner is lead J2EE engineer for Accruent, Inc. in Santa Monica, CA.

Mark A. Ruthven is product manager for Western Union in Englewood, CO.

Class of 2028

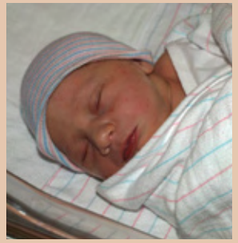
Eric May '99 and his wife, Margaret, announce the arrival of their son, Davis Michael, born January 4, 2008.

Anna (Gray) '95 and **David** '06 **Hanley** welcomed their son, Thomas Giles, on October 13, 2007.

John '84 and Sonia Guffey are happy to announce the birth of their second child, Christopher Noel, on January 9, 2008, in Ho Chi Minh City, Vietnam.

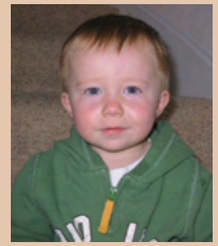
Jeff '03 and Jessica Jantos, along with big-sister Emma, welcomed Gabriel Timothy into the world on November 27, 2007.

Jennifer (Harvey) Tobin '03 and her husband, Nick, announce the arrival of their son, Joshua Charles, born December 29, 2006.



Matthew '99 and **Kimberly** '00 **Sands** announce the arrival of Evan Keith on February 25, 2008. He joins his big brother Andrew.

Michael J. Orobona '91 and his wife, Stacey, announce the arrival of their son, Bennett Richard Hewitt, born June 5, 2007.



Chadwin Cox '93 and his wife Merrie, along with Caleb (8) and Brooklynn (5), welcomed Levi Anthony to their family on April 26, 2006.

Jesse M. Warman is a process engineer for the Forerunner Corporation in Lakewood, CO.

2003

Ahmed Khaleefa Al-Neaimi is a reservoir engineer for Abu Dhabi Marine Operating Company (ADMA-OPCO) in Abu Dhabi, United Arab Emirates.

Matthew C. Balzer is senior territory manager for Neopost Inc. in Denver, CO.

Robyn C. Brown is a staff engineer for Hepworth-Pawlak Geotechnical in Silverthorne, CO.

John P. Gabrielson received his PhD in chemical engineering from the University of Colorado – Boulder in May 2007. He works for Amgen in Longmont, CO.

Steven T. Maxson is a project manager for Shafter Baucom Engineering & Consulting in Lakewood, CO.

Peter M. McCarty is natural gas marketing analyst for Enserco Energy Inc. in Golden, CO.

Jennifer K. (Thompson) Pergola is now working as a sales engineer for her family business, Pumps Plus, Inc. in Louisville, CO.

Jessica V. Sigala is a geophysicist for the U.S. Geological Survey in Golden, CO.

Kathryn H. Soto is a production supervisor for Toyota Logistics Services in Long Beach, CA.

Scott M. Stanley is a reservoir engineer with ConocoPhillips in Anchorage, AK.

Philip D. Tunnell is an engineer II for Tetra Tech, Inc. in Ontario, CA.

Jordan R. Wiens founded Xenon, Inc., an engineering and field service company, based in Los Angeles, CA, servicing the oil and gas industry.

Matthew R. Winkler is a control system engineer for Precision Engineering, Inc. in Mobile, AL.

2004

Brandon R. Baker is a senior midstream engineer for Devon Energy Corporation in Bridgeport, TX.

James R. Heath is a water resources engineer and owner of TZA Water Engineers, Inc. in Lakewood, CO.

Tara N. Holz is a mechanical engineer for BC Tech Inc. in Santa Cruz, CA.

Paul E. Hopkins is a project engineer with Flatiron Constructors Canada in Calgary, Alberta, Canada.

Heath R. Kirin is an account manager for Rocky Mountain Instruments in Lafayette, CO.

Christopher E. Lindeman is a process design engineer for BBI International in Lakewood, CO.

Cristian H. Malaver is geophysical techology advisor for El Paso Corporation in Houston, TX.

Saw Ler Mu is reservoir engineering manager for MPRL E&P Pte. Ltd. in Yangon, Burma (Myanmar).

Russell A. Powell is a 1st lieutenant and project engineer for the U.S. Air Force at Hurlburt Field, FL.

Courtney J. Rister is a laser vulnerability engineer at the U.S. Air Force Research Laboratory at Kirtland AFB, NM.

Jennifer L. Schenkman received her P.E. in 2007 and is a transportation EI for HDR Engineering, Inc. in Albuquerque, N.M.

Nicholas A. Swerdfeger is production manager for BuildASign.com in Austin, TX.

Daniel J. Trapp and Kristin were married in December 2005, and their son David John was born September 3, 2007. They currently live in Golden, CO.

Tashi Tshering is a geophysicist for the Department of Geology and Mines in Thimphu, Bhutan.

2005

Jaime L. Ayala and **Richard Ayala** '06 were married on October 6, 2007 at Light of the World Catholic Church. The reception was held at the DoubleTree Hotel in Westminster. A number of Mines graduates attended their ceremony.

Steven P. Fremen is an applications engineer for Flowserve in Compton, CA.

Christopher J. Holcombe is a process engineer for the ATMEL Corporation in Colorado Springs, CO.

Profile

Putting Down Roots in Anchorage

15 volunteers on a housing project for low income families in Anchorage. And every Thursday evening during the winter she heads to a local ski hill where she is a Special Olympics downhill coach. "I enjoy teaching others a sport I love. Their enthusiasm is contagious and I always leave with a smile on my face," she says. Olivia and Forest also ski most winter weekends, but not at the local ski hill. "We do a lot of backcountry skiing. In the summer months we hike and bike, but I can't get enough skiing," she says, adding that she's getting ready for her first heli-trip at the end of March. Having met at Mines in their freshman year chemistry lab, Olivia and Forest enjoy returning to campus for work, but when they do, it's on different teams. "Forest works for ConocoPhillips and we are both on recruiting teams for our companies," she explains, "But we don't fight over candidates. A Mines graduate coming to Alaska is a win-win for everybody. We just hope every new hire feels challenged and rewarded in his or her new position."

Olivia Bommarito '03, ME '05 was recently presented with the 2007 Society of Petroleum Engineers Western Region Outstanding Young Member Award, recognizing contributions and leadership in the energy industry and local community. The award was given at the SPE Annual Technical Conference and Exhibition held in Anaheim, CA, in November. Three faculty members from the Petroleum Engineering Department attended the awards luncheon in her support (left to right): Jennifer Miskimins, assistant professor; Bill Eustes, associate professor; Olivia; and Ramona Graves, professor and interim department head. Based in Anchorage, AK, Olivia is a production engineer for BP, a job she's held since graduating with her master's degree in petroleum engineering in 2005. After only three years, she oversees production for two drill sites located in the Prudhoe Bay oil field, 850 miles north of Anchorage. She enjoys her job. "I am faced with new challenges daily," she says. She's also enjoying Alaska. When she first moved to Anchorage with her husband Forest '03, ME '05, they were anticipating about a three-year stay, but that has changed. "We want to be here for another five to ten years," she says. "We love it here, and it's great to feel settled and a part of the community." And Olivia has managed to make lots of connections. "There's a large community of Mines alumni in Anchorage. It's been a great network for us," she says. She's also volunteering for several organizations. She is the current treasurer for the SPE Alaska Section and has held positions as the golf tournament and scholarship BBQ committee chairs. As a crew chief for Habitat for Humanity, she coordinated

Lon A. Hutt is a software engineer for the Boeing Company in Colorado Springs, CO.

Andrew J. Leenheer is a graduate student at California Institute of Technology in Pasadena, CA.

Rafael M. Ribeiro is an engineer for Tractorbel Tratores e Pecas BHte. LTDA. in Belo Horizonte, Minas Gerais, Brazil.

Richard Eric Thompson is a product engineer for Sundyne Corporation in Arvada, CO.

Dean D. Turner is president of Global Geotechnologies LLC in Littleton, CO.

2006

Said M. Al-Lawati is an associate production engineer for Occidental Mukhaizna LLC in Al-Athaybay, Sultanate of Oman.

Sarah E. Doyle is an environmental scientist for Golder Associates in Lakewood, CO.

Jonathan C. Hebert is an independent consultant in Golden, CO.

Luis Zenon Martinez is a consultant for Harding Consulting Alliance in Denver, CO.

Meghan R. McKee is a drillsite facility engineer for ConocoPhillips Alaska, Inc. in Anchorage.

Jon M. Orth is an associate technical professional for Halliburton Energy Services. He lives in Grand Junction, CO.

Terra A. Plute is a graduate student at the Colorado School of Mines.

Erin M. Rundberget is an air weapons officer in the U.S. Air Force, stationed at NATO Air Base in Geilenkirchen, Germany.

Stephanie A. Savage is a senior project analyst for Entegrity Wind Systems, Inc. in Boulder, CO.

Brandon L. Segura is a materials engineer for Ktech Poly-Flow Engineering in Albuquerque, NM.

Carly E. Skinner married James Gay on March 11, 2007 in Steamboat Springs, CO.

Megan M. Starr is a petroleum engineer for Questar Exploration and Production in Denver, CO.

2007

Benjamin C. Betts is a petroleum engineer for Whiting Petroleum in Wickett, TX.

Kyle M. Davis is a metallurgist for Cameron in Houston, TX.

Eldar Guliyev is a geophysicist for Occidental Oil and Gas Corporation in Houston, TX.

Michael A. Hurowitz is a process engineer for Phiar Corporation in Boulder, CO.

Robert Edward Keith is a senior scientist for ITT Industries, Inc. He lives in Colorado Springs, CO.

Eirik A. Pyhtila is a management associate for USS-POSCO Industries in Pittsburg, CA.

Katherine Muterspaugh Steele is a graduate student studying mechanical engineering at Stanford University in Stanford, CA.

Jason C. Stingerie is a design engineer for Baker Hughes. He lives in Houston, TX.

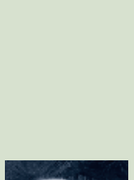
Ashlin H. Tucker is a staff engineer for Group Delta Consultants, Inc. in Aliso Viejo, CA.

Passings

To live in hearts we leave behind Is not to die.

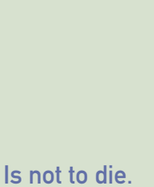
—Thomas Campbell 1777-1844

Charles "Chuck" S. Aldrich MS '74 of Aurora, CO, died on October 15, 2007. Prior to attending Mines, he served as a U.S. Navy aviation cadet during World War II. He later joined the Air Force as an aviation cadet based in San Antonio, TX. After receiving his commission, he was stationed at numerous locations in the U.S. and overseas. He served in Korea and Vietnam, and was stationed in Japan, Germany and Thailand. Of the many medals and commendations he received while serving in the Air Force, he considered the Distinguished Flying Cross as his highest achievement. Having earned his bachelor's degree in petroleum engineering from the University of Texas while still in the Air Force, he came to Mines immediately after retiring from the Air Force to begin work on his master's degree. With sights set on ultimately teaching petroleum engineering, he first sought to accumulate practical experience in the field. He worked for Atlantic Richfield in Indonesia and Alaska's North Slope. He then returned to Mines and taught in the Petroleum Engineering Department. During a sabbatical from Mines, he taught at National Cheng Kung University in Taiwan and the University of New South Wales in Australia. He later returned to Australia on four separate occasions. He is survived by his wife, Arlene Aldrich, his children, one granddaughter, and his great grandchildren.



Keith E. Anderson '60 died at his home in Olympia, WA on October 5, 2007. Born in Greeley, CO in 1936, he grew up in Eaton, CO. While at Mines studying for his master's degree in petroleum engineering, he served as president and social chairman of the Kappa Sigma fraternity. After graduation he and his family moved to Illinois, where he worked for Northern Illinois Gas Company and, in 1970, earned a master's degree in business administration from Northern Illinois University. Three years later he moved with his family to Washington: first to Spokane, to work for Washington Water Power, and afterward to Seattle. In 1994, he retired from his position as president of Washington Energy Resources Company, an oil and gas exploration subsidiary of Washington Natural Gas. He and his wife, Annette, then moved to Olympia, where they began a second career traveling the country buying and selling antiques. He is survived by Annette, his wife of almost 49 years; four children; eight grandchildren; a brother; and a sister.

Ralph J. Bowman '48 of Indio, CA, died on August 25, 2001. He was born on April 4, 1926 in New York City but spent most of his childhood in Miami, FL. While still at Mines studying toward his degree in petroleum refining, he enlisted with the U.S. Army. After the war, while still in the military, he attended the University of Kentucky where he earned a bachelor's degree in civil engineering. Under the G.I. Bill, he also earned master's degrees in chemical engineering from MIT and business administration from New York University. He went on to become the supervisor of economic and corporate planning for Union Oil in California. After retiring from Union Oil, he became a certified financial analyst at the University of Virginia. During retirement, he enjoyed tennis, bridge and his vegetable garden. He was predeceased by his wife, Edith "Fran" Welsh. He is survived by his daughter, Adrienne Bowman; his son, Kim; and two sisters, Betty Bowman and Ruth B. Hauser.



Logan Verne Caldwell '40 died on August 29, 2007, at his home in Charlotte. Born in Illinois in 1916, Logan moved with his family to Wisconsin and later Wyoming. After graduating from high school in 1933 in Rock Springs, WY, he joined the Civilian Conservation Corps before coming to Mines in 1936 to earn his engineer of mines degree. Upon graduation he moved to Pittsburgh, PA, and worked in the engineering department with the Pittsburgh Coal Co. During World War II, he served in both the Army and Air Force, achieving the rank of major. After the war he became a lubricating engineer with Atlantic Richfield until his retirement in 1977. Logan was predeceased by his first wife, Grace Virginia Farrell, with whom he was married for 41 years. In 1983, he married his second wife, Edith, and soon became an integral member of her large family. With a passion for music, he sang in numerous groups throughout his life—quartets, church choirs and community productions—and enjoyed reciting poetry, story telling and baseball. At Charlotte Presbyterian Hospital he earned his 3,500 Hour Pin for dedicated service. He was also predeceased by his brother, Oliver. He is survived by his wife of 24 years, Edith Caldwell; stepdaughters, Linda Jenkins and Beverly Lynch; stepson, Tom Pegram; brothers, Howard and Larry; sister, Gladys Kerley; and several step-grandchildren and step-great-grandchildren.

James G. Campbell '86 of Marshall, VA, died on October 25, 2007. Born in Lima, OH, in 1952, he earned a degree in electrical engineering from Georgia Tech in 1977, before obtaining his degree in geophysical engineering at Mines. He also obtained a master's degree in business administration from the University of Houston. He was an offshore field engineer for Schlumberger for many years. After moving to Virginia, he served as an energy consultant for the economic and management consultancy, Snavely, King, Majoros, O'Connor and Lee, as well as NASA's Center for Space and Advanced Technology. He also served in an advisory capacity to the chairman of the Federal Energy Regulatory Commission. He supported the Sierra Club and PETA. He is survived by his brother, Charles.

George Dolezal, Jr. '50 of Lakewood, CO, died on December 7, 2007, at his home surrounded by his family. Born in Perry, OK, he was the oldest of three brothers. During World War II, he served as a second lieutenant pilot bombardier in the Army Air Corps. He met and married Carol Martindale while he was attending Mines, with whom he shared 61 years. He graduated from Mines with a degree in geological engineering. Throughout his 50-year career as an independent geologist in oil and gas exploration, he was based in Denver, where he could be seen once or twice daily walking downtown smoking his cigar, or over the lunch hour in the Cigar Room at the Brown Palace Hotel. He had two passions in his life: his wife and family, and the oil and gas business. He viewed his decision to attend Mines as pivotal to the formation of both. Up until the very end of his life, he was at his office working on a project. He is survived by his wife, Carol; his two children, Teresa and Doug; and his brothers, Jack and Jim.

Arthur James Dyson '51 of Amarillo, TX, died on November 13, 2007. Born in 1923, in Milford, MA, he grew up in Casper, WY, and enlisted in the U.S. Army Air Forces immediately after graduating from high school. He completed pilot training in early 1944 and flew 35 missions as a B-24 pilot in the 8th Air Force stationed in England. In 1949 he married Eva K. Frisch, who predeceased him in 1985. After earning his petroleum engineering degree from Mines, he spent his career working in Texas, Louisiana and the Rocky Mountains before retiring in 1985. He was a member of Kappa Sigma fraternity, Knights of Columbus, the Society of Petroleum Engineers and the International Association of Drilling Contractors. He was a member of St. Thomas the Apostle Catholic Church. He married Margaret M. Heberling in 1996. His brother, Gordon, and sister, Gladys also predeceased him. He is survived by his wife, Margaret; his son, Tony; three stepchildren, Raymond, Robert and Teresa; seven grandchildren; four great-grandchildren; and two great-great-grandchildren.

Robert H. Everett '43 of Wesley Chapel, FL, died on June 25, 2007. Born in Baldwin, KS, he earned his degree in petroleum engineering from Mines before beginning his service with the Army Corp of Engineers as captain during World War II. He was married to Frances Sherman of Lafayette, LA, for 57 years, dividing the majority of their time together between Lafayette and Houston, TX. They moved to Tampa, FL, in 2002. He is survived by his wife, Frances; his daughter, Joanie Everett-DeCoito; and three grandchildren.

John Guy Fidel '55 of Albuquerque, NM, died on October 3, 2007. He grew up in Albuquerque in the El Fidel Hotel with his sister, Lou Delle, and his parents. After the death of his mother, he moved to El Paso, then Austin, and finally Santa Fe, where he attended St. Michael's High School, playing football and getting involved with student and civic governance. He also began dating his future wife, JoAnn Shaya. At Mines he earned his degree in geological engineering. After working in the oil business for a number of years, he became manager and part owner of the Sundowner Motor Hotel in Albuquerque, where he developed a computer program for the hotel industry with IBM. He served as a board member of many charitable and civic organizations, including the Chamber of Commerce, Better Business Bureau, Albuquerque Boy's Club, Hotel and Restaurant Association, St. Pius High School and Noon Day Ministries. He taught the Life in the Spirit course at his Catholic Church for twenty-two years and was involved with other Christian organizations. Above all, his deep faith in God and love of family and friends were the hallmarks of his life. He is survived by his wife of 53 years, JoAnn; his sons, John, Ray and Stephen; his daughter, Lisa Adams; 11 grandchildren; and his sister, Lou Delle F. Pongetti.

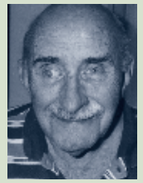
Robert Geisendorfer '64 died in Surfside, CA, on October 13, 2007. He grew up in the midst of his family's Colorado farming operations, where he gained an early competency in all things mechanical. During and after high school, he won several local and national scholarships, including a Naval ROTC scholarship to Stanford, an invitation to be a member of the inaugural class of the Air Force Academy and later an appointment to West Point. He attended both Stanford and West Point before serving two years in the army. After his discharge, he attended Mines where he received his metallurgical engineering degree. He later received a master of science in metallurgy from the University of Denver and completed his doctoral work at Ohio State University.
He worked in the aerospace industry as a research engineer and scientist. He developed new alloys (primarily titanium) now used in military and commercial aircraft, space vehicles, engines and medical components. He also worked for the Department of Ecology in aluminum, titanium and superalloy process development. Most recently, he worked as a consulting metallurgist for firms in both the public and private sectors.
An avid outdoorsman from an early age, he shared his love and enthusiasm for hiking and camping with his children. He is survived by his high school sweetheart and wife of 49 years, Gloria; his sons, Gregg, Grant, and Glenn; his daughters, Cheryl Hosking, Laura Baden, Sandra Collier and Sarah Harter; 11 grandchildren; his brother, Paul; and his lifelong friend and sister, Mary Cornwell.

James C. Hollingsworth '53 of Shreveport, LA, died on September 26, 2007. Born in 1923, he served in the U.S. Army from 1943 to 1946 in radio intelligence. He served overseas during World War II, which included landing on the beaches of Normandy on D-Day. He received his bachelor's degree in science and geology at Centenary College magna cum laude, earning memberships in the honor fraternity, Omicron Delta Kappa. He went on from there to Mines, where he earned his master's of science in geophysics. After graduating, he worked for several corporations, including Colorado Exploration Co. based in Golden, Phillips Petroleum, Nilo Oil and Tensas Delta Land Co. Beginning in 1966 when he was based in Shreveport, he pursued work as an independent consulting geologist. He was a longtime member of the Shreveport Geological Society, the Society of Exploration Geophysicists and the American Association of Petroleum Geologists. He was also a member of the English Speaking Union, the Shreveport Symphony, the Shreveport Opera Guild and St. Mark's Episcopal Cathedral.
He was predeceased by his first wife of 27 years, Marian Pardue. He is survived by his second wife, Cheryl Denise; his daughters, Marian Hollingsworth Keator and Robin Hollingsworth Yearwood LaBorde; his son, James C. Hollingsworth Jr.; five grandchildren; and six great-grandchildren.

David A. Jacoby '73 of Washington, NC, died on October 14, 2007. He was born in Lakewood, OH, in 1951. After graduating with a degree in mining engineering, he worked for Peabody Coal in Arizona, before starting his 32-year career with Texas Gulf Phosphate, later to become PCS Phosphate Company. His career was divided between the company's plants in Aurora, NC, and Saltville, VA. He was most recently a senior project engineer at the Aurora location, where he was valued for his wide knowledge of operations in many areas of the plant. In 1981, he married Kaye Lynn Fischbach. Dave was an active member of the Church of Christ. He is survived by his wife, Kaye; his mother, Mary; his brothers, William and Jeff; and his sister Pat Levine.

Michael Kyrias '74 of Vail, CO, and formerly of Alaska, died on November 16, 2007. Michael was born in Wichita, KN, in 1952. He graduated from Mines with a bachelor's degree in chemical engineering and petroleum refining. He began his career with Arco, working at the Cherry Point Refinery in Bellingham, WA. He later worked in the development and operation of the Prudhoe Bay oil field for more than 20 years. Most recently, he managed the development of oil fields in Malaysia, Australia, Thailand and Egypt. He is survived by his wife, Louise Byrne; his mother, Betty; his daughter, Jenifer Shaw; his sisters, Brenda Davis and Karla Kyrias; and three grandchildren.

Donald J. McMullen '44 of Concord, CA, died on December 18, 2007, surrounded by his family. He was born in Champaign, IL, in 1919, although his family soon moved to Denver, where he spent the majority of his youth. He earned his degree in geological engineering from Mines and later went on to study at MIT and the University of California, Berkeley. His career was largely spent working for the state of California as a civil engineer; he retired in 1981. His wife of 51 years, Kathleen, died four years ago. He is survived by his seven children and six grandchildren.



Eric Newman '54 died on July 21, 2007, at Good Samaritan Hospital in Lafayette, CO. He was born in Saskatchewan, Canada, in 1930. After completing high school in Port Arthur, Ontario, he attended the Lakehead Technical Institute, also in Port Arthur, where he studied mine engineering. Eric then transferred to Mines, where he earned his geological engineering degree in 1954. Just days prior to graduation, he married Ingeborg Rønning of Norway, with whom he enjoyed 53 years of marriage. Eric worked in the mining industry his entire career, beginning in the gold mines of northern Quebec and later moving on to uranium mining in Wyoming. His work took him throughout the U.S., Canada, Australia and Africa. He served as president of the Sons of Norway and volunteered for the Colorado School of Mines Alumni Association for many years. Second to his family, Eric's greatest joys in life were traveling, reading, opera and classical music. He is survived by his wife, Ingeborg (Inge); his sons, Thor and Paul; his daughter Ann Moore; five grandchildren; and one great-grandchild.

Jack McKnight Pardee '36 died at his home in Albuquerque, NM, on October 10, 2007. He was born in Buffalo, NY, in 1913. Jack graduated from Mines with a degree in mining engineering. While at Mines he lettered in football, track and wrestling. He married Alice Pike of Phoenix, AZ, in June 1939. During World War II, he was commissioned in the U.S. Army Corps of Engineers Reserves and was called to active duty in January 1941, serving as commanding officer of 1281 Engineers Combat Battalion. During the war, he spent time in both Europe and the Philippine Islands before being detached in 1946 with the rank of lieutenant colonel. He then returned to his pre-war position with Miami Copper Co., Miami, AZ, as supervisor, mineral exploration drilling. He went on to work for Cerro de Pasco Corporation as project supervisor for exploration of the Cuajone copper ore-body in southern Peru, South America. The last 20 years of his career were spent as a mining engineer for the U.S. Forest Service. He was an avid outdoorsman who enjoyed camping and hunting. A committed conservationist, he dedicated many hours to volunteer projects with the Sandia Ranger District, cross-country ski club and Albuquerque Wildlife Federation. He began running at age 47 and continued to run daily until aged 83. He began competing in cycling events in the late 1970s and set several national records in the 20K time trials at Moriarty. Jack competed in the New Mexico Senior Olympics from 1979-2005 and won numerous medals in cycling, triathlon, running, discus, javelin, shot put and air pistol/rifle. He was predeceased by his wife, Alice, in 1993. He is survived by his five children: Lenore, Jude, Mavourneen, Robie and Gordy; eight grandchildren; four great-grandchildren; his brothers, William and Robert; and his sister, Constance Braxton. He was buried with military honors in the Santa Fe National Cemetary—32 members of his family were in attendance.

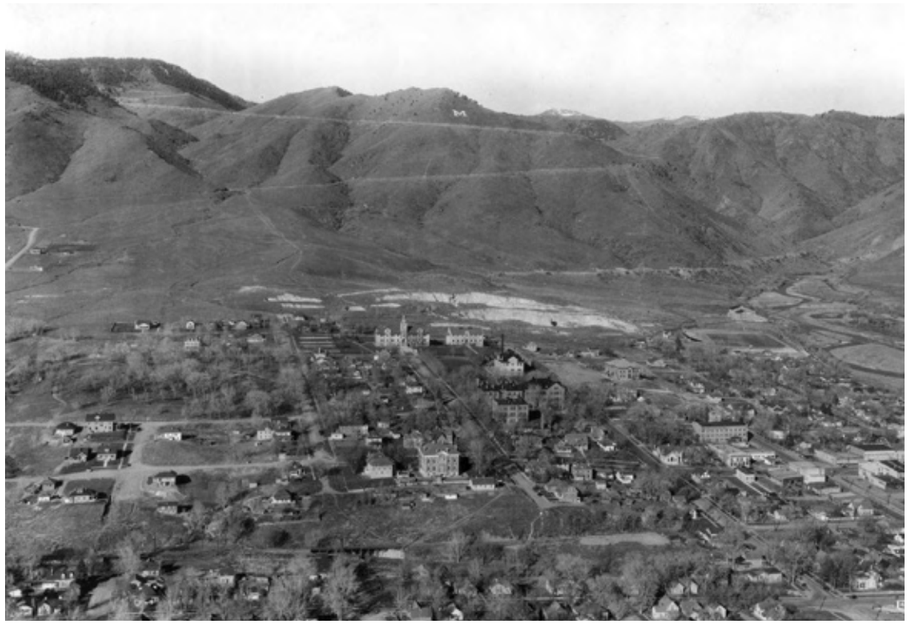
David Rothers '85 of Lakewood, CO, died on June 18, 2007. David grew up in Lakewood. While attending Alameda High School, he played basketball, baseball and soccer. He was also an Eagle Scout and played the saxophone. At Mines, he earned a bachelor's of science degree in petroleum engineering. After graduation, he moved to Sacramento, CA, to work for Schlumberger. In 1990, he moved to Houston, TX, where he worked for Baker Oil Tools for 17 years. He held progressively more responsible positions, finally achieving senior project engineer in the Sustaining Engineering Group specializing in flow control and packers. During his tenure with Baker, he traveled to Syria, Congo, Angola, Venezuela, Bahrain, Saudi Arabia and Scotland. He enjoyed sports, traveling, wine collecting, entertaining, and was an active member of the Saint Anthony of Padua Catholic parish in The Woodlands, TX.

Henry Truebe '64 died on August 12, 2007. Henry was born in New York in 1943. After earning both his undergraduate degree and master's in mining engineering from Mines, he joined the Peace Corps and taught in Tonga, the Pacific archipelago, for two years. After returning to Colorado, he moved to Crested Butte where he spent several years seeking precious minerals in various locations in the surrounding mountains. In the late 1970s, he returned to school at the University of Arizona and completed a master's degree in geosciences and economic geology in 1982, and his doctorate in mining and geological engineering in 1991. He met and married Laura J. Kosakowsky, a Maya archaeologist, in 1981, and they settled in Tucson, AZ, where Henry began a successful consulting business specializing in remote sensing, image processing, and digital mapping and analysis in mineral exploration. Henry enjoyed caving, and was an active member of the National Ski Patrol. His greatest love was for rocks, minerals, and the earth around him. Henry is survived by his wife, Laura Kosakowsky; his daughter, Sarah; and his son, Brian.

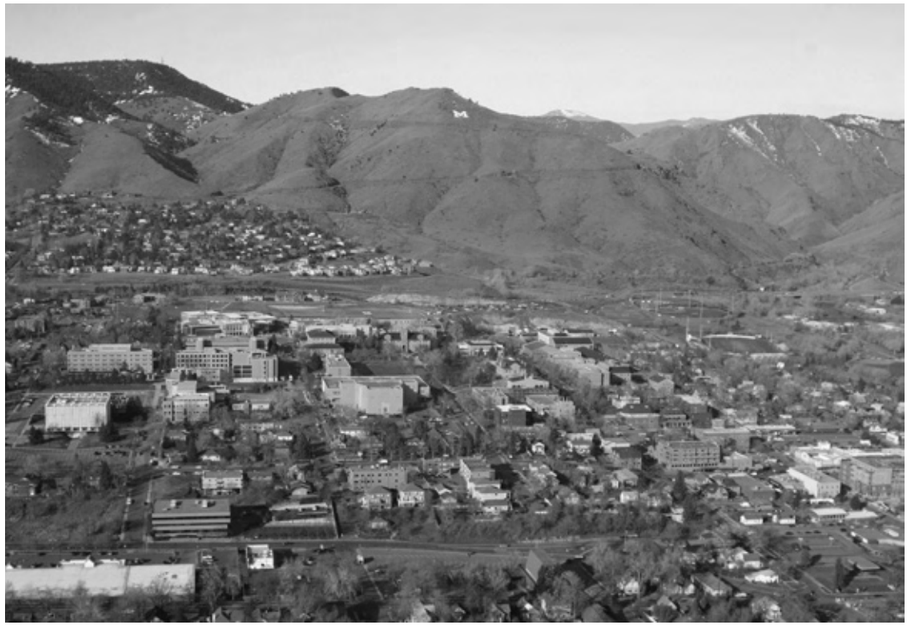
Vernon R. Thompson '52 of of Palm Beach Gardens, FL, died on June 25, 2007. Vernon was born in Osage City, KS, in 1930. After earning his degree in metallurgical and materials engineering from Mines, he worked at Battelle Memorial Institute in Columbus, OH, where he met his wife, Barbara. They subsequently moved to Philadelphia where Vernon served in the US Army at Frankford Arsenal. After being discharged, he went to work for Crucible Steel in Pittsburgh, PA, remaining there for 23 years while he raised his family. In 1980, he moved to Palm Beach Gardens where Vernon was employed by Pratt and Whitney Aircraft in their Materials Research Division until he retired in 1991. Vernon specialized in research and development in the powder metallurgy field, including processes for welding of tool steels and producing super alloys. He holds eight U.S. Patents in these fields, and he was proud of his contributions to the ASM Metals Handbook and the AWS Welding Handbook.
Above all, Vernon was devoted to his family, as a husband, a father and a grandfather. He is survived by his spouse of 52 years, Barbara Thompson; his son, David Thompson; his son Craig Thompson; his daughter, Shirley Faircloth; six grandchildren; and four sisters. He was predeceased by his two brothers.

Also In Memoriam

Edward M. Feely '50 ..... October 8, 2005
Robert L. Garrett '45 ..... March 13, 2007
James E. Heppert '49 ..... November 24, 2006
Robert B. Hill PhD '70 ..... June 1, 2006
John V. Newhouser '50 ..... March 30, 2006
Robert J. Young '44 ..... May 30, 2007



View from South Table Mountain circa 1908



View from Same Location, 2008

P.S. Last Word is a very popular section of the magazine, but alas we didn't receive one for this issue. If you have an idea or an essay you want to share, please get in touch with the editor: magazine@mines.edu.

At Your Service

Mining (continued)

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