

MINES



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Biodetection Research Protects Pentagon and White House

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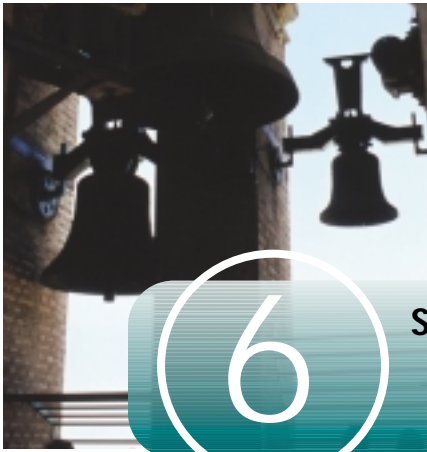
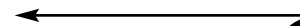
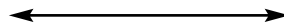
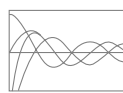
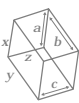


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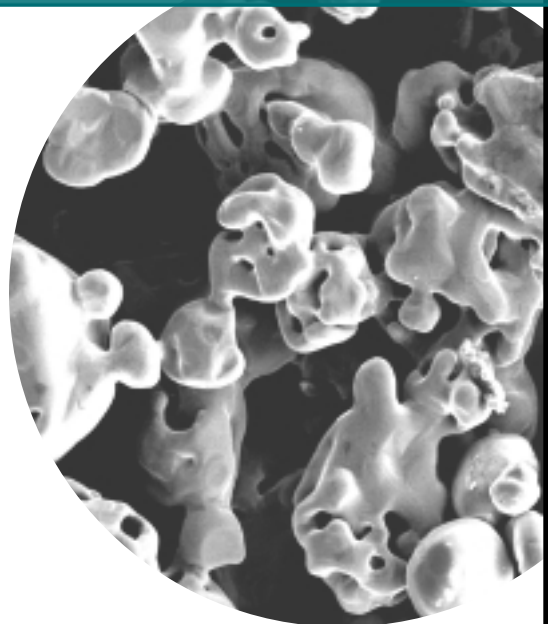
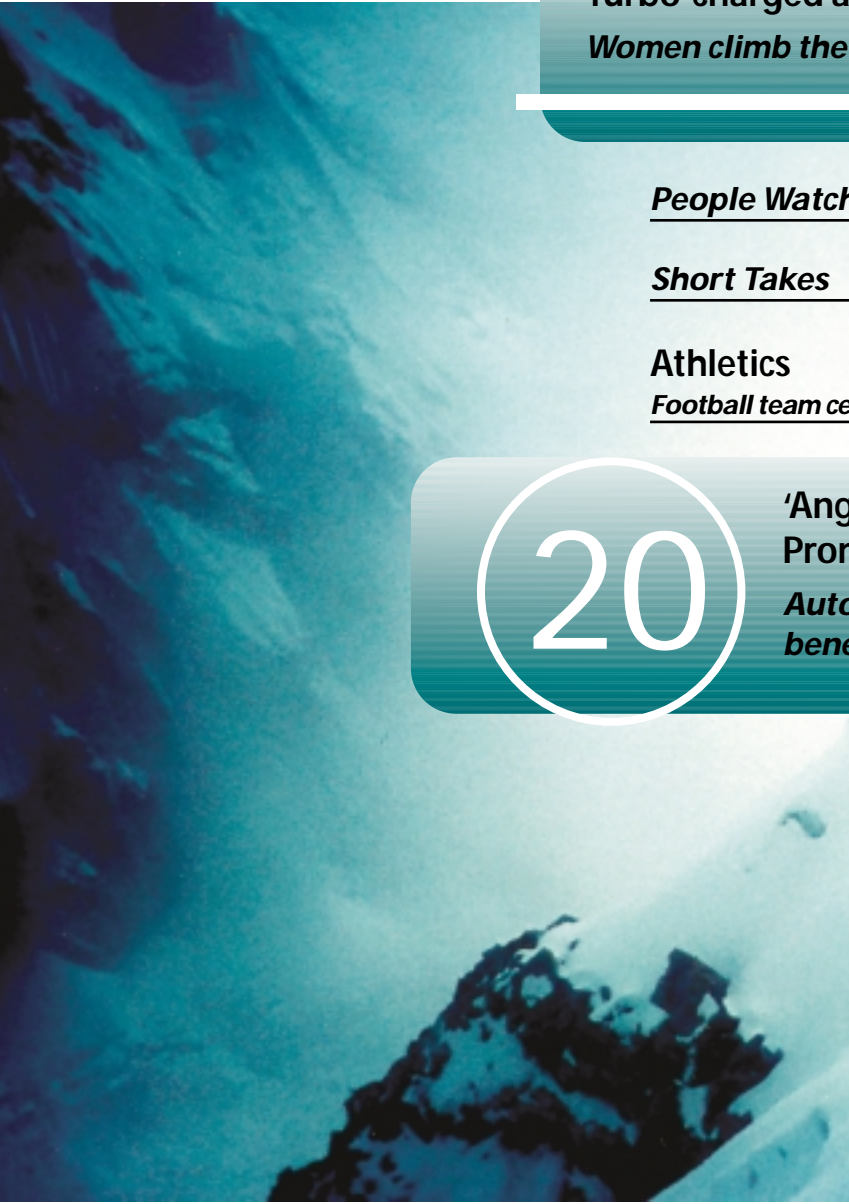
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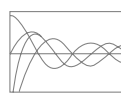
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About Our Cover:

Dr. Kent Voorhees of CSM's Department of Chemistry and Geochemistry helped develop bioweapons detectors that were installed in the aftermath of September 11 to protect the Pentagon and the White House from anthrax and other pathogens.

Cover Photo by Tom Cooper

MINES WINTER 2002

Mines is published quarterly by the Colorado School of Mines and the CSM Alumni Association for alumni and friends of the School. The magazine is a merger of *Mines Magazine* (founded in 1910) and *Mines Today* (founded in 1986). The merger took place in 2000.

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BYU "Y" Challenges Mines "M"

I had my first opportunity to visit Colorado School of Mines last Friday, October 26, during which I met with faculty and students in the CSM Chemistry Department and very much enjoyed my stay. While walking back to visitor parking, I stopped to read some information about the M-blem on Mt. Zion. The description says that it is at 104 ft. by 107 ft. "the largest electronically lit school emblem in the world." I found this same description several times on the CSM website. I write to inform you that the "M" is, in fact, not the largest school emblem, nor has it ever been — since BYU's "Y" is larger and older. I suspect both of these symbols were responses to the 100 ft. by 100 ft. block "U" at the University of Utah, constructed in 1905. The CSM website describes how the "U" was the inspiration for the "M," but I guess no one at BYU would admit that our athletic archrivals at Utah were first.

The block "Y" of Brigham Young University measures 380 ft. by 130 ft. (32,847 sq. ft.). It was placed there April 15, 1906 (at least a year before the CSM "M"). It has been electronically lit for special occasions since the 1960s or 1970s. Previous to the placing of electric wiring, it was lit by torches. The "Y" is visible for miles around Utah Valley, and has been the symbol of BYU for several generations. I have attached a digital image of the "Y" behind our chemistry building. You will also find the "Y" in many images on the BYU website (<http://www.byu.edu>).

While I was at the University of Colorado in Boulder around 1980, someone suggested that Colorado put a "C" on the flatirons. This idea was quickly dismissed as a desecration of the mountain. I have some sympathy with this sentiment, so I have no real interest in pursuing somewhat dubious bragging rights. However, in the interest of truthfulness, I invite you to reply by forwarding to me a copy of the press release you will be issuing correcting this egregious error which has probably been perpetrated for nearly a century.

Thank you,
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Silver or sheepskin?

Reading the "Short takes – Silver diplomas given to all graduates" I couldn't help feeling a bit miffed that my silver diploma has been tarnished a bit more than what just age has done to it. "Tradition" had it that the silver diploma was reserved for the engineering degree. Though we trust that Mines will always excel in its fields, I can't help but feel there's a difference between the 200+ semester hours many of us toiled to complete and that which is required today for a bachelor's degree. Sure, my "silver plate" has spent most of its life in a drawer; its meaning was for my benefit, not to impress anyone else. I had to do that on my own with what CSM had provided for me. I did, on countless occasions, have to explain to people that I did not have a B.S. and that my degree represented a good bit more, etc. Giving every grad a silver diploma would be like giving every soldier a black beret!

Bob Metz Geol Eng '55

All CSM graduates complete a higher average number of semester hours than are required for comparable science and engineering degrees at other institutions. In addition, graduates complete coursework that continuously increases in complexity. Therefore, we are awarding silver diplomas to all graduates of CSM's rigorous and exemplary academic program. For a degree so highly respected around the world, a distinctive diploma for all graduates seems appropriate.

Harold R. Chevront
Vice President and Dean of Students

How many engineers does it take to play a carillon?

By Leah McNeill



How many engineers does it take to make a carillon chime? Apparently, quite a few!

When President John Trefny decided to hold a special noontime campus service following the September 11 tragedies, he requested that the carillon be programmed with appropriate music.

With only hours to spare, an ad hoc team quickly assembled in the bell tower of Guggenheim Hall – over half a dozen volunteers from a variety of campus departments.

Since no one on campus that day had ever played or programmed the carillon, members of the Public Affairs staff perused the selection of music available, while information technology and telecommunications staff – led by CSM Director of Institutional Research **Sharon Hart BSc Geol '80** – initiated a self-directed crash course in programming the electronic instrument.

The carillon is usually programmed once a year by staff from the Academic Affairs Office. In addition, Chemical Engineering Professor Bob Baldwin, an accomplished organist, is also a carillonneur. But he was out of the country at the time, and the only other person on campus with prior carillon-programming experience was on maternity leave.

With typical Mines spirit, the team nonetheless accomplished the task, with only minutes to spare. The campus gathering ended with the soothing tones of Handel's "Water Music" wafting over the hundreds of students, faculty and staff gathered on Kafadar Commons.

"The degree of difficulty in programming the carillon lies somewhere between programming your computer and your cell phone," said Hart. "And working in the Guggenheim tower gave new meaning to the phrase 'bats in the belfry.'"

The Mines carillon is from the "Americana" series, the flagship instrument manufactured by Schulmerich Carillons Inc. of Sellersville, Penn. Other Schulmerich bell instruments have graced sites around the world, from the Vatican Pavilion at the 1964-65 New York World's Fair ... to the Tomb of the Unknown Soldier in Arlington National Cemetery. For more on the carillons, go to <http://www.schulmerichbells.com/>.

The Mines carillon was donated to the school in 1966 by **Arthur C. Daman EM '15**, born in 1889 in Chicago. He was the founder of Denver Equipment Company, a manufacturer of mining machinery. The company expanded into a worldwide organization with subsidiaries in five countries, before merging in 1967 with Joy Manufacturing Company of Pittsburgh.

Mines President Orlo Childs unveiled the carillon with a half-hour premiere concert at June commencement in 1966. Before his death in 1968, Daman and his wife visited the campus again to hear a Christmas concert performed by the carillon.

In 1970, the carillon was temporarily silenced to allow for installation of new wiring in Guggenheim Hall. Since that time, it has been peeling out the traditional Westminster chime on the hour from 8 a.m. to 6 p.m., seven days a week. At noon and at 6 p.m., it plays selected melodies that range from hymns to popular tunes, including the School's alma mater and fight song.

The unit itself consists of miniature bell units made of bronze bell metal, which are struck by metal hammers. The bell units produce exact true bell tones that are almost inaudible to the human ear, until they are amplified over one million times by specially designed electronic equipment, producing bell music with all the depth and richness of traditional cast bells of massive proportions.

Originally, the carillon was equipped with a special roll player. Perforated plastic rolls generated the music, much like the old player pianos. Nowadays, the music is generated by special digital cassettes tapes.



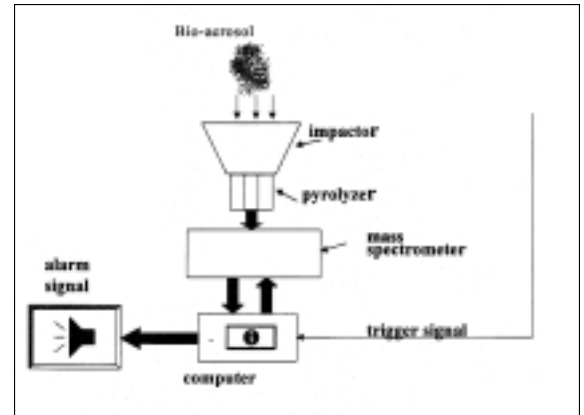
The Mines Carillon Committee in action

Seventeen Years of Biodetection

By Leah McNeill

Devices that can rapidly detect both bacterial and chemical substances have been the focus of 17 years of research by Dr. Kent Voorhees in the biodetection laboratories of the Department of Chemistry and Geochemistry.

The bioweapons detectors he helped develop have been used on United Nations and U.S. Army vehicles for about four years. More recently, in the aftermath of September 11, they were pressed into service to protect the Pentagon and the White House from anthrax and other biochemical weapons.



The process for bioweapons detection is based on a protocol developed at Mines.



Grad student Angelo Madonna monitors results in biodetection laboratories in the Department of Chemistry & Geochemistry.

The second generation of this device – which was named one of the top 100 inventions by *R&D Magazine* in 2000 – detects very low levels of aerosols and identifies them in about four minutes, precluding the hours or days needed by other detection techniques.

Despite the recent use of anthrax, however, Voorhees and his associates say chemical weapons are more of a concern than bioweapons.

Biological agents are harder to “weaponize,” they explain, pointing out that Japanese terrorists failed to use bioweapons successfully but were able to kill a dozen people and injure hundreds with sarin gas.



Research at Mines Pays Off

The original detectors are relatively large, so the biodetection team at Mines is working on a miniaturized, hand-held device to rapidly detect agents that might be used by hostile troops on the battlefield or by terrorists on civilian populations.

Another application under development at Mines uses antibody methodology to sort bacteria from a human fluid sample. Not only will it pinpoint difficult-to-diagnose diseases, but it will also be able to distinguish between two closely related strains of the same bacteria that might otherwise prove difficult to differentiate.

Since the bioterrorism incidents began in the United States, the expertise of Voorhees and his associate Dr. Franco Basile has been sought by a wide variety of media. One question on the minds of local reporters is how prepared is the state of Colorado.

Voorhees points out that Colorado is far ahead of other states, thanks to the efforts of State Rep. John Witwer, who co-sponsored with Sen. Tom Arnold ahead-of-its-time legislation, readying the state to deal with such terrorist acts.

Passed in 2000, the bill set up a governor's expert emergency epidemic response committee to plan, prepare for, and respond to bioterrorism incidents and emergency epidemics.



Governor Bill Owens (center) at the emergency response bill-signing ceremony with (from left) State Sen. Tom Arnold, CSM's Kent Voorhees and State Rep. John Witwer.

Could the biodetector already in use by the U.N. and U.S. military be helpful in bioterrorism attacks against civilians in Colorado or other locations? It's a possibility, although cost could be a limiting factor, according to Voorhees.

"However, they could be produced much more cheaply if they were manufactured to less stringent specifications than the military's detectors, which are nuclear-blast hardened and capable of surviving electronic disturbances," he explained.



Turbo-charged at 15,000 feet

By Leah McNeill

When Mathematical and Computer Sciences Senior Lecturer Hugh King talks about “a turbo-charger that kicks in at about 15,000 feet,” he’s not referring to a special airplane.

He is speaking of his wife Magda, a veteran mountaineer who has climbed half of the world’s highest mountains, all over 26,000 feet.



The 2001-2002 Chevron Lecturer, Magda addressed a standing-room-only crowd in the Student Center Ballrooms on Sept. 26. This annual event is coordinated by the Women In Science, Engineering & Mathematics (WISEM) program at Mines.

A native of Barcelona, Magda began her climbing career at Montserrat in Spain, progressing to the Pyrenees. “I was absolutely passionate and knew from the first day that this was what I wanted to do with my life,” she recalled.

Things that come too easily have no meaning, she believes, but overcoming tremendous physical and mental challenges provides self-confidence and a sense of accomplishment. This response to adversity is what kept her alive through the worst storm to hit the Himalayas in Nepalese history!

In 1987, after a 21-day trek to reach base camp at 21,000 feet on Mount Yalung Kang, Magda was prevented from making the final ascent to the top when her jacket blew away at 24,000 feet.

Then worse luck. A monster storm struck. For five days, Magda and her climbing partner clung to the steep slopes of the seventh highest peak in the Himalayas. Every two hours, she had to force



Magda King on the summit of Cho Oyu at 26,907 feet

herself out of her tent into the raging blizzard and shovel off the snow, to keep the tent from collapsing.

With very little food or fuel, the climbers were given up for dead. But on the sixth day, the weather cleared and they found their way down to base camp, which was completely buried in snow.

“That climb became the epicenter for all my other expeditions,” she said. “I survived it and was better prepared for the future.” Even so, her next trip was almost cancelled before it got started.

To increase the odds that at least one member of the team would make it to the top, Magda wanted to take an expedition of women to climb Cho Oyu. After obtaining a permit from the Chinese, she had only six months to pull her team together and raise the necessary \$40K.

Then, the revolt at Tienamen Square occurred in Beijing and the Chinese cancelled all spring expeditions. While hoping for the political situation to improve, Magda persisted in getting her expedition ready. Finally, she and her partner were able to go to Cho Oyu, hiring a Sherpa to increase their safety on the mountain.

While climbing on Cho Oyu, a woman from an

A (Nearly) Peak Experience

By Marsha Konegni

Italian expedition was caught in a huge avalanche, as she headed for the summit along with a Sherpa climber. "The frantic voice of the Sherpa came over my radio, describing how he could not find Valentina. He could not even tell his own location due to the heavy fog," she recalled.

Despite this frightening episode, Magda and her partner reached the summit three days later, changing the history of female climbing in Spain as they became the first women from that country to reach the summit of an 8,000-meter peak.

Reflecting on her adventures, Magda considers the highest summit of her climbing career to be the little school she helped build in the remote Nepalese village of Yarmasing. To repay the hospitality the country had showed her, she worked for months to raise money, secure supplies, and help villagers construct a school.

Primary among the many lessons Magda has learned from her mountaineering adventures is that we must not be afraid to live our dreams.

"In living our own dreams, we cannot only dramatically improve our own lives, but the lives of the people we meet along the way. The challenge in life is to find something bigger than ourselves, something that makes us grow and allows us to contribute," she said.



CSM freshman Marissa Reigel climbed 22,384-ft. Aconcagua in Argentina with her father, Craig Reigel.

Making her way to the top of Aconcagua, the highest peak in South America, 16-year-old Marissa Reigel repeatedly questioned herself. "Why am I doing this? I could be somewhere else. Even calculus homework would be better. *Why am I doing this?*"

But when the final ascent to the 22,834-ft.

summit was cancelled, Marissa cried.

Now a Mines freshman, Marissa shared her climbing story with other CSM students this fall at a Magnificent Mountaineers Series program sponsored by the School's Outdoor Recreation Center. As a junior in high school, the Vail, Colo., student made the Aconcagua attempt in a group with eight others, including her father and a guide who has climbed Everest twice, summiting it once.

It was foul weather that kept her group from making the final summit. "Climbing is a big guessing game because of unpredictable weather," Marissa explains. "But you always want to put safety first." So, faced with extreme conditions including 70 mile-per-hour winds, Marissa's guide cancelled the final ascent.

Marissa had trained for Aconcagua by climbing mountains around Vail, as well as Mt. Rainier in Washington. She had traveled to Argentina four days prior to the climb. And she had spent 14 days reaching the 19,000-ft. camp on Aconcagua. According to Marissa, toward the end of the climb, the lack of oxygen meant "walk a step, then breathe, walk a step, then breathe." She crossed a snowfield where she knew if she fell, she would "go 8,000 feet and end up in Chile." So not reaching the top "was a huge disappointment, but a good decision," she says.

Would she do it again? "It taught me a lot," she answers. "Given the opportunity, sure I'd go back."

Explosives research may help in fight against terrorism

The shockwave propagation research of **Vilem Petr PhD '01**, while done with mining in mind, could help us in our war against terrorism. Petr's research helps us understand fracture phenomenon. It can be applied to blasting for mines or in building protective walls that will absorb the shockwaves of a terrorist's bomb. It can also be used to attack tunnel targets, according to a branch chief of the Defense Threat Reduction Agency.

"We still don't understand fracture phenomenon completely," says Petr. His goal is to design a "cookbook" for different rocks, a database for blasting experts. A more complete understanding of the phenomena could lead to optimization of and cost reduction of blasting operations. "It's the next step in mining," he explains. "Using less explosives to get more work done."



Currently CSM's Mining Engineering Department has plans to expand this research concerning the development of "smart" construction materials to include both Department of Transportation and Department of Defense interests. "It is of the utmost importance for these reasons to develop a theoretical model validated with experimental data that provides a better understanding of how shock wave energy, due to dynamic loading, is transmitted and reflected through non-homogeneous geomedia or artificial composite material through boundary layers [joints, fractures]," says Petr.

Petr, who is from the Czech Republic, comes from a long line of miners. His grandfather was a coal miner and his father was an open-pit miner. Growing up, all his friends' families were miners. Therefore, it seemed a logical career choice for Petr as well. In 1992, he graduated from the Technical University of Mining in Ostrava, Czech Republic. He worked as a mining engineer for several years before deciding to continue his education in the United States.

"After the 'velvet revolution' in the Czech Republic, I was very interested in seeing and learning about what was in the forbidden worlds—America and Western Europe," says Petr. "I wanted to see the biggest and most sophisticated equipment and machinery, which was only in the U.S., with my own eyes. In 1992, I arrived in the U.S. and in 1994 began studying for my master's degree at the New Mexico Institute of Mining and Technology in Socorro. There is where I met my life's dream...I started to work on shock

wave phenomena and fracture theories from dynamic loading. New Mexico is where I first put my heart and mind to the science of explosives engineering."

"While still in the Czech Republic, I learned about Colorado School of Mines as one of the most prestigious mining schools in the world. I was hoping I could one day study here and in 1997, I got my wish and I was accepted in the doctoral program.

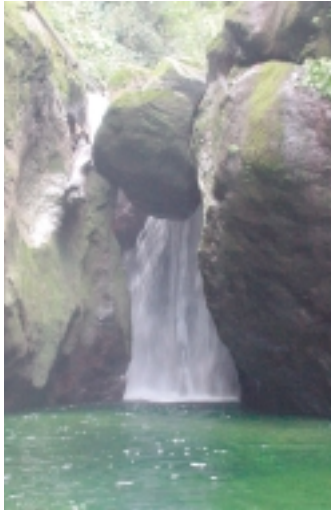
"I was fortunate to meet Prof. Rozgonyi, head of the mining engineering department, who readily shared his unparalleled knowledge and experience in mining engineering and assisted me in developing my research program. The department did not have intensive research in rock fragmentation with explosives, so Prof. Rozgonyi was pleased seeing my wholehearted work to develop this program."

Rozgonyi credits Petr with the development of CSM's now-intensive research programs in the fields of blasting and explosives engineering. Jointly with current student Faisal Hashem he has established the CSM International Society of Explosives Engineering student chapter and a newly developed partnership with Orica USA, Inc. Petr also has projects with Applied Research Associates, Inc. All of Petr's research companies are globally recognized explosives engineering organizations.

"To my great honor, under the supervision of Dr. Rozgonyi and Dr. Mustoe, we have developed one of the first experimentally-based theoretical models for non-homogeneous geomedia with complex physical properties and boundaries," says Petr. "We have established a close relationship with the explosives industry and when I finished my doctoral degree, I got an offer to do further research from a global explosives-engineering company. We are expanding our relationships with the Department of Defense and the Defense Threat Reduction Agency and are working to develop "smart concrete" to protect military personnel and equipment in battle."

Simpson '99 pursues master's through Peace Corps

John Simpson BSc Eng '99 is a water and sanitation engineer for the Peace Corps in Choluteca, Honduras. At the same time, he is pursuing a master's degree in civil engineering. "I attended Michigan Technological University for two semesters where I took graduate classes in civil engineering, as well as engineering in the developing world," he explains. "I am sending back reports quarterly to Michigan Tech and will either complete my thesis while down here or when I return after two years. My emphasis is water resources." Simpson is the first person to do the program in civil engineering.



Simpson moved to Honduras last July. "I am still getting used to the everyday poverty here. I have been to villages where a family of six sleeps in two beds in a house with no walls. Every day I see something that would be considered shocking to most people in the States. Whether it is the shoeless kids playing outside the health center with the used syringes laying on the ground or the kids outside my apartment sniffing glue until they pass out, it is a lot different here."

Honduras offers spectacular scenery (above) and poverty-stricken towns, such as Choluteca (below).



Choluteca is on the Pacific coast in the southern part of the country. "Hurricane Mitch more or less destroyed Honduras in 1998, and for the past two years there has been a pretty tough drought, which has left a lot of people very poor. Honduras is typically considered the poorest area of Central America, and southern Honduras, where I work, is typically the poorest of Honduras," Simpson adds.

For the first three months, Simpson lived with a host family and learned Spanish before moving to Choluteca where he will stay. "So far I have helped build two latrines and an incinerator at a health center, a small watch catchment basin in a stream and have completed a basic survey and design of a water system." In general, he continues, "water and sanitation engineers work to develop clean drinking water systems for rural areas as well as promote the improvement of sanitary conditions."

Promoting sanitation is the challenge, explains Simpson. "Whatever I build has to be easier than what currently exists, and what exists now is simply walking out on the front porch and doing what has to be done. Water systems are a little easier to pitch as everyone wants clean water, and if done right, the amount of work to use a properly-designed system, when compared to walking to the river, is much less."

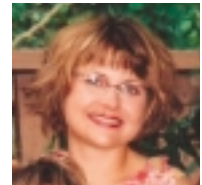
Simpson's Mines education is serving him well, particularly his courses in surveying and hydraulics. "But my work here is much more than that and usually I'm just trying to solve the problem at hand, like where can I get something that somewhat resembles gravel and what burro can bring it up the mountain? My work will consist of a very wide range of possibilities, from building schools to teaching computer classes. The broader engineering program at Mines definitely will benefit me."

Sullivan '90 creates study, reference material

Academic pursuits have proven rewarding for **Kathleen Sullivan BSc CPR '90**. While studying for the Professional Engineer licensing exam, she used study materials from Professional Publications, Inc. (PPI), the leading publisher of engineering licensing exam review materials. Although she studied chemical engineering at Mines, at the time she was working as a water resources engineer, so she studied for the civil engineering PE exam. In doing so, she found she had a lot of questions.

"The author's email address was on the web site, so I went to the source," she explains. Sometimes her questions identified errata in the publication, and at other times, she illuminated areas where additional explanation was beneficial. "After a number of email interactions, the author of the book (who was also PPI's president), asked me if I would be interested in doing contract work for PPI after the exam was over." That's how Sullivan came to work for PPI and Michael Lindeburg, a name familiar to many engineers because it appears on the bindings of the Fundamentals of Engineering, Civil, Mechanical, and other reference manuals used to review for their licensing exams.

"I really enjoyed it," she says of her first editing job for PPI. "I hadn't done anything academic for a while, but I enjoy learning." Sullivan's first assignment was as a technical reviewer, working through the problems in a manuscript to check technical accuracy and making sure the materials adequately covered the subject.



"I thought it would be ideal if I could do this full time," she continues. Now she does. After two contract jobs, Sullivan was offered a full-time position with PPI as staff engineer and developmental editor. Sullivan's job primarily entails technically reviewing and developmentally editing manuscripts in various engineering disciplines to ensure the material correctly and clearly educates the user. "I studied journalism in high school," she recalls. "Journalism has been an interest for a long time. Writing comes fairly easy for me." She also responds to engineering queries posed by other departments in the company, such as marketing and production, and assists in evaluating initial submittals from authors and technical reviewers. Special projects offer still more variety in her daily work. "PPI is a very dynamic company comprised of people always innovating and challenging themselves to take the company to the next level – a clear benefit for our customers," Sullivan adds.

Sullivan works out of her home in Englewood, Colo. "It's been quite an adjustment, having no one around during the day," Sullivan says. Before turning to editing, Sullivan worked as a process engineer in a chemical plant for three years in Wichita, Kan. But she missed Colorado and the pursuit of her favorite hobbies: skiing and mountain biking. She returned to the state in 1993 as the industrial enforcement engineer for the Colorado Water Quality Control Division. Sullivan worked for three years as a water resources engineer for the Colorado Division of Water Resources before joining Professional Publications last July. The company is always looking for contract technical reviewers and authors, Sullivan notes. For more information, check the company Web site, www.ppi2pass.com.

Glade '77 is prominent in Latino community

By Judi A. Diaz-Bonacquisti

Giving back to the community has always been a high priority for **Mike Glade BSc Min '77**. He has served on the board of directors for Servicios de la Raza, La Escuela Tlateloco, El Centro Su Teatro and the Hispanic Contractors of Colorado. Arguably the most distinguishing quality about Mike is the commitment he has for these types of organizations, even though Mike Glade is not Latino.

The grandson of immigrants from Russia and Eastern Europe, Mike could easily relate to the Mexican immigrants in his childhood neighborhood near Regis University. "My father worked for the railroad and my mom worked at a construction firm. North Denver was my home and my neighbors were my friends."

The importance of education was stressed to him at an early age and upon graduating high school, Mike enrolled at Adams State College in Alamosa, Colo., on a football scholarship. "I never really considered Mines at that point," he said. "I had no idea what engineers did, and besides, Mines seemed unattainable." It wasn't until he received encouragement from his physics professor at ASC that he considered transferring. That encouragement was a lesson never lost on Mike.

"Students need encouragement to consider fields like engineering, especially when no one else from their family is in those fields. It's all about exposure; there is nothing inherently natural for a man over a woman or an Anglo over a Latino to be in engineering." And when a student is considering engineering, Mike always stresses the value of a Mines education. "You can't find a better education in the state, and Mines is one of the best in the nation. It's a prestigious degree that impresses people."



Mike suggests that students take advantage of the resources available to them, such as attending college fairs, to fully prepare for college. "It's amazing how few kids know what engineers do, or the doors an engineering degree can open for them."

A bachelor's degree in mining engineering opened many doors for Mike. He earned a master's of business administration from Denver University and a juris doctorate from Lewis and Clark University in Portland, Ore. Although he graduated in the top third of his law class, Mike contends that earning the law degree was not as rigorous as it was at CSM. "Mines prepares you for any graduate degree. It forces you to learn."

Mike relates his academic achievement at Mines to his college football experiences. "I was a middle linebacker with more spirit than talent, but my perseverance leveled the playing field."

Mines Chosen by EPA To Be Part Of New Hazmat Research Center

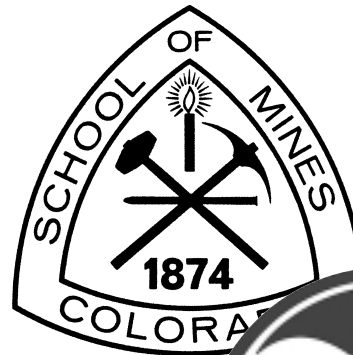
EPA Administrator Christie Whitman announced in November that a consortium of CSM and Colorado State University (CSU) faculty has been selected as one of five U.S. centers that will do major research and outreach on hazardous substances.

The Mines-CSU consortium will focus on ways to remediate mine wastes and conduct outreach activities such as training, technology transfer, assisting

communities with environmental problems, evaluating pollution's impact on the environment and capitalizing on diversity through involvement of under-represented groups.

This center, funded in the amount of \$3.8 million for an initial period of five years, is comprised primarily of investigators at Mines and CSU, with additional academic and non-academic center participants located in several other regions of the United States and Canada.

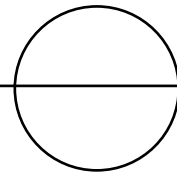
Don Macalady of Mines and Sandra Woods of CSM will serve as assistant directors.



The center covers a six-state region including Colorado, Utah, Wyoming, Montana and North and South Dakota.



SHORT STAKES



CSM Hosts Discussions On September 11-Related Topics

In response to the terrorist attacks of September 11, the CSM Diversity Committee hosted a series of brown bag lunch discussions.

- "The CSM Relationship with Abu Dhabi" was presented by Dr. Nigel Middleton, vice president for academic affairs and dean of faculty.
- "War and Peace in Islam" was presented by Dr. Hussein Amery of the Division of Liberal Arts and International Studies.
- "What to do When Tragedy

Strikes: A Faculty Discussion" was moderated by Dr. Ruth Streveler, director of the Center for Engineering Education.

CSM Signs Agreement With Ghent University

Seven University of Ghent representatives visited the Mines campus in November, when Ghent University's rector, Prof. Dr. A. De Leenheer, and CSM President John U. Trefny signed an agreement of cooperation during ceremonies in Arthur Lakes Library. More than 23,000 students attend the Belgian university, which was founded in 1817.



Visiting delegation from Belgium's Ghent University



During inauguration ceremonies at mid-year commencement on Dec. 14, John U. Trefny was presented with a Presidential Medallion.

John U. Trefny Inaugurated As 15th President Of Mines

As part of the commencement ceremonies Dec. 14, F. Steven Mooney, vice president of the CSM Board of Trustees, presented Dr. John U. Trefny with a Presidential Medallion.

The Colorado School of Mines Presidential Inauguration symbolizes the formal beginning of office.

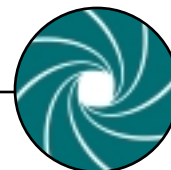
Wagner Keynotes Midyear Commencement

CSM Board of Trustee David J. Wagner was the keynote speaker at the midyear commencement ceremonies Dec. 14 in Bunker Auditorium in the Green Center.

Over 250 degrees – including bachelor's, master's, doctoral and a professional degree – were awarded at the ceremonies.



Colorado State Senator Norma Anderson and Colorado State Representative John Witwer were honored with Mines Medals at December commencement ceremonies.



CSM Hosts Technology And Entrepreneurship Seminar Series

Commercialized patenting and entrepreneurial growth within modernistic technology-based business ventures are just a few of the many topics of discussion that took place at the *Technology and Entrepreneurship Seminar Series* at the Colorado School of Mines in November and December.

This lecture/seminar series, co-sponsored by CSM and the University of Colorado-Denver, is designed to give the audience practical and academic perspectives on the essential elements of prosperous entrepreneurship through interactive presentations

from some of the nation's leading experts.

Dr. Patrick MacCarthy, professor of chemistry at CSM and a successful inventor, discussed "Inventing, Patenting and Commercialization: The Big Picture."

MacCarthy holds 13 U.S. and four foreign patents, several of which have been licensed to major manufacturers and been marketed worldwide. His program focuses on the integral process of inventing, patenting and licensing in the competitive commercialized marketplace.

One of the founders and former president and CEO of Catalina Marketing Corp., **George Off**

BSc Math '70, discussed "Catalina Marketing: An Entrepreneurial Growth Story."

Off worked his way through CSM as a grocery store clerk during his undergraduate years to later become the CEO of the Catalina Marketing Corp., which has a net income of \$400 million. His seminar emphasized the significant influence of technology-based business ventures in the current entrepreneurial market.

Mines Professor Elected President Of Colorado Scientific Society

Dr. Eric P. Nelson, associate professor in the Department of Geology and

Geological Engineering, has been elected 2002 president of the Colorado Scientific Society, which is the oldest scientific and technical society in the Rocky Mountain region. The objective of the society is to promote the understanding of science and its application to human needs, focusing primarily on earth science, but including all fields of science. Members include representatives from many earth-science organizations, including federal and state government agencies, universities throughout the region, private industry and individuals.

Dr. Nelson is one of several Mines faculty members who have held this position.

Dr. Iwao Iwasaki was awarded an honorary degree. He is currently a senior research associate and holds the Endowed Taconite Chair in the Coleraine Minerals Research

Laboratory at the University of Minnesota-Duluth.

As an adjunct professor in the Department of Metallurgical and Materials Engineering at Mines in 1993, Dr. Iwasaki delivered a distinguished faculty seminar to faculty and students.

There were three recipients of Mines Medals:

- Norma Anderson, Colo. State Senator, representing District 22
- **Robert W. Pearson PE '59**, CSM teacher, coach and athletic administrator
- Dr. John P. Witwer, Colo. State Representative for House District 25.

Mines Faculty Author New Textbooks

A Guided Tour of Mathematical Methods for the Physical Sciences, written by Professor Roel Snieder of the Geophysics Department, has been published by Cambridge University Press. The book constitutes a guided tour of the mathematical methods for students in the physical sciences. In contrast to traditional textbooks, all the material is presented in the form of problems. In these problems the basic theory and its applications are integrated.

A book by the Geophysics Department's Dr. Ilya Tsvankin, titled *Seismic Signatures and Analysis of Reflection Data in Anisotropic Media* in the series *Handbook of Geophysical Exploration*, has been published by Elsevier.

A co-author of *The Finite Element Method for Engineers, 4th Edition* is Dr. Douglas E. Smith, assistant professor in the Division of Engineering. The textbook has been published by John Wiley and Sons.

SHORT STAKES

New 'Engineering Your Future' Program Is Joint Effort

"Engineering Your Future" is a joint effort of the CSM Minority Engineering Program (MEP); CSM Women in Science, Engineering and Mathematics Program; IBM; and Denver Public Schools (DPS).

It is intended to encourage girls and ethnic minorities to pursue math, science and engineering as college majors and eventually careers.

CSM students and IBM researchers are conducting hands-on science and

engineering workshops at four Denver middle schools.

On Nov. 20, President John Trefny and DPS Superintendent Jerry Wartgow held a joint news conference at Lake Middle School in Denver announcing this endeavor.

"We are trying to reach students at a critical stage of their educational careers," said CSM's MEP Director Judi Diaz-Bonacquisti. "If students get excited about engineering now, they may take the necessary classes in high school that will allow them to pursue engineering at the college level."

Workshops include Introduction to Engineering, Kitchen Chemistry, Polymer Science, Sound and Light, Mathematical Algorithms, and Environmental Science.



Students at four Denver middle schools took part in hands-on science and engineering workshops intended to encourage girls and ethnic minorities to pursue math, science and engineering.

'Bio Expo' Showcases Leading Edge Biotechnology Research

The annual Colorado Alliance for Bioengineering (CAB) "Bio Expo" was held in December at Fitzsimons Bio-Science Park.

Featured speakers were Colorado Science and Technology Secretary Marc Holtzman and Colorado Commission of Higher Education Executive Director Tim Foster. The focus this year is "University and Industry Technology Transfer."

"The 21st century is being called the 'Century of Biology' and the state is at the leading edge," Holtzman says.



One of the CSM biotechnology projects showcased at the annual Bio-Expo was a shoe insert, designed to prevent diabetes patients from developing ulcers or burns that can lead to amputation.

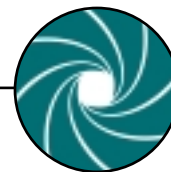
"CAB fosters the type of close collaboration between industry and academic research that is critical if Colorado is to maintain scientific and technological leadership."

The CAB is a consortium whose members include Colorado School of Mines, Colorado State University, University of Colorado-Boulder/Denver, Health Sciences Center, and University of Denver.

"The mission of the alliance is to enhance

university-based education and research in bioengineering and life sciences," explains CAB chairperson Rahmat Shoureshi, Ph.D., director of technology transfer for the Colorado School of Mines.

The group also hopes through educational partnerships to accelerate the transfer and application of technology to enhance the competitiveness of Colorado's growing bio-industry, he added.



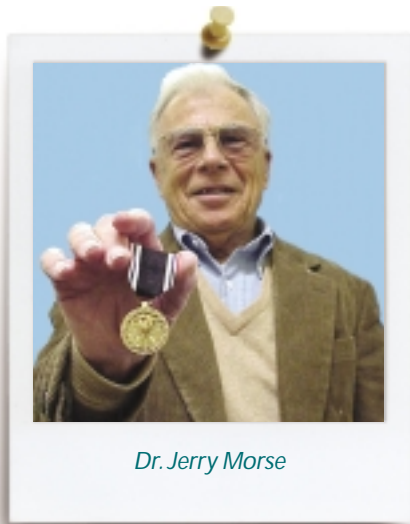
Physics Research Professor Jerry Morse Dies

Dr. Jerome "Jerry" Morse died Dec. 10, 2001, after a brief illness.

He came to Mines in 1976 as an adjunct professor in the Department of Physics.

A member of a B-17 crew during WWII, he became a prisoner of war after his plane was shot down during a bombing run over Germany.

Dr. Morse earned master's and



Dr. Jerry Morse

doctoral degrees in physical chemistry and later joined the Martin Company. It was at Martin that he and his team of researchers developed the world's first miniaturized nuclear generator, a pioneering effort in the peaceful use of the atom. The grapefruit-sized model was presented to the public in

a White House demonstration by President Eisenhower on Jan. 16, 1959.

In 1961, the device powered a Navy satellite into orbit, the first use of nuclear power in space.

While at Mines, Dr. Morse was instrumental in helping develop and direct two institutes, the Colorado Energy Research Institute and the Colorado Advanced Materials Institute.

Contributions can be made to a fund in his honor. Contact Traci Weller, 303-273-3128. Checks should be made payable to the CSM Foundation and directed to the Jerry Morse fund.

International Day 2001 Repays Community

Native dress, food and performances from many countries around the world were highlighted at International Day in November in the Green Center.

Open to the public, the celebration of International Day represents the "thankfulness of all the CSM international students to the Golden community's warmth, kindness and hospitality," according to I-Day 2001 Chairman William Martinez, a junior from Arequipa, Peru, who is majoring in metallurgical and materials engineering.

During I-Day, the 60-plus countries represented on campus were



Hitzman Appointed Department Head

Dr. Murray W. Hitzman, the Charles Franklin Fogarty Professor of Economic Geology, has been appointed head of the Department of Geology and Geological Engineering. He will also continue to

hold the Fogarty Professorship.

Hitzman holds A.B. degrees in anthropology and geology from Dartmouth College, an M.S. degree in geology from the University of Washington and a Ph.D. in geology from Stanford University. He came to Mines in 1996.

His industry experience includes positions with the Anaconda Company, Bear Creek Mining Company and Chevron Minerals. He also has several years' experience in national public policy, having been a member of Sen. Joseph

Lieberman's staff, and later worked in the White House Office of Science and Technology Policy on environmental and natural resource issues.

SHORT STAKES

featured, as students cooked native dishes and served them to visitors.

A talent show featured students performing songs and dances from their native countries.

Astronauts To Wear Patch Designed by Mines Employee

Mindy Raya Gewuerz, program assistant in the Center for Commercial Applications of Combustion in Space (CCACS) at CSM, has designed a patch that will be worn by several astronauts when they

travel to the International Space Station in January 2003.

Gewuerz, an artist with an interest in science, says that she was asked to create a patch by Dr. Jacques Yves Guigné, president of Guigné International Ltd., after he saw her painting at CCACS entitled "Max Eclipse" (total solar eclipse), named for her father Max because the eclipse occurred on his birthday.

Guigné, inventor of Space-DRUMS™, told her that he envisioned a design that would express what goes on inside Space-DRUMS™, which is a containerless materials processing facility for the International Space Station (ISS).

CCACS has commissioned Guigné for the first commercial payload on the ISS, and the astronauts who are conducting the experiment will wear the patch.



International students in their native dress represented more than 60 countries at the 2001 CSM International Day.

Golden Year for Oredigger Football: 2001 marks Mines' first winning football season since 1991 and their highest win total since 1958.

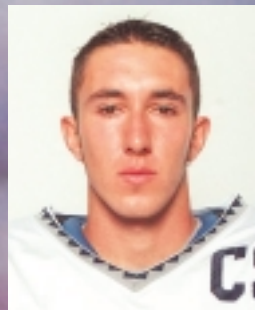
The Rocky Mountain Athletic Conference recognized eight members of the Colorado School of Mines football team for their outstanding performances in 2001. One first-team selection, two second-team selections, and five honorable mentions helped second-year head coach **Bob Stitt's** Orediggers to a 7-4 overall record.



Junior wide receiver/return specialist **Brian Sump** was named to the RMAC's Offensive and Defensive First Teams as a wide receiver and a kick return specialist. **Sump**

finished the 2001 season as Mines' leading receiver as he caught 59 passes for 1,175 yards and 12 touchdowns. He averaged 19.9 yards per reception and 106.8 yards per game in the air.

In the returns department, **Sump** tallied 780 kick return yards and four touchdowns on 21 returns to average 37.1 yards per carry. **Sump's** four TDs off kickoff returns on the year sets a new NCAA II record, and with five in his career, **Sump** needs just three more to tie the NCAA II record for



touchdowns off kickoff returns in a career.

Sump also returned 18 punts for 219 yards in 2001. He led the Orediggers in all-purpose yardage with 2,174 yards on the season.

Senior offensive lineman Keith Lopez took home RMAC Offensive Second-Team honors, as he played at the left tackle slot in his final season in Golden. Lopez, a four-year letterman at Mines, was key to the CSM offensive line throughout his career, as he also saw time at right tackle and center as an Oredigger.

Senior cornerback Tolu Lasaki received RMAC Defensive Second-Team accolades, as he finished the season second on the defensive charts with 69 total tackles in





2001. He grabbed 49 solo tackles as a senior along with a team-high seven interceptions for 73 yards, 14 pass deflections, one fumble recovery, two forced fumbles and one blocked kick.

In the RMAC Honorable Mention department, **Zach Snyder**, **Josh Hodsdon**, **Daniel Leger**, **Nate Jackson** and **Andy Nord** all received recognition.

Senior receiver **Snyder** finished the year third on the receiving charts with 50 receptions for 700 yards and four touchdowns. He averaged 16 yards per catch and 70 receiving yards per game and also returned 12 kicks for 294 yards on the season (24.5 yards per return) to finish second on the squad with 1,000 all-purpose yards.

Junior punter/place kicker **Hodsdon** made nine of his 13 attempted field goals for the Orediggers, made 30 of 36 attempted PATs, and averaged 39.6 yards per punt with a long of 70 yards throughout the season.

Freshman outside linebacker **Leger** led the Oredigger defense with 81.5 tackles, 54 solo, throughout his rookie campaign, adding 15 for a loss of 52 yards, 2.5 sacks for a loss of 20 yards, two interceptions for 15 yards, five deflected passes, and two forced fumbles.

Junior quarterback **Jackson** broke every Oredigger passing record but one in 2001. Jackson holds Mines records for most passing touchdowns in a season with 30, most completions in a season with 227, highest passing completion percentage in a



CSM quarterback Nate Jackson had a stellar junior campaign as he broke 14 Mines football records and led the Orediggers to a 7-4 season record.

season with 57.3 percent, most completions in a game with 36, most attempts in a game with 58, most passing yards in a game with 494, most total yards in a game with 498, and most touchdown passes in a game with seven. **Jackson** also holds the single-season records for most passing yards in a season with 3,240, and most total yards in a season with 3,328.

Senior fullback **Nord** finished his final year in Golden second on the Mines rushing list,

as he carried the ball 38 times for 231 yards and four touchdowns. He also caught 13 passes for 99 yards and one touchdown on the season and finished fifth in scoring with 32 points for the Orediggers.

By Kacey Kingry

A photograph of a man with glasses, wearing a white shirt, a patterned tie, and a dark vest, looking intently at a piece of laboratory equipment. The equipment includes a large, dark, spherical object at the top, several glass flasks and tubes, and a large, perforated metal mesh structure in the foreground. The scene is lit with a warm, yellowish light, suggesting an indoor laboratory setting.

'Angel investor' needed for commercially promising micro-filter

By Pam Greenberg and Jarett Zuboy

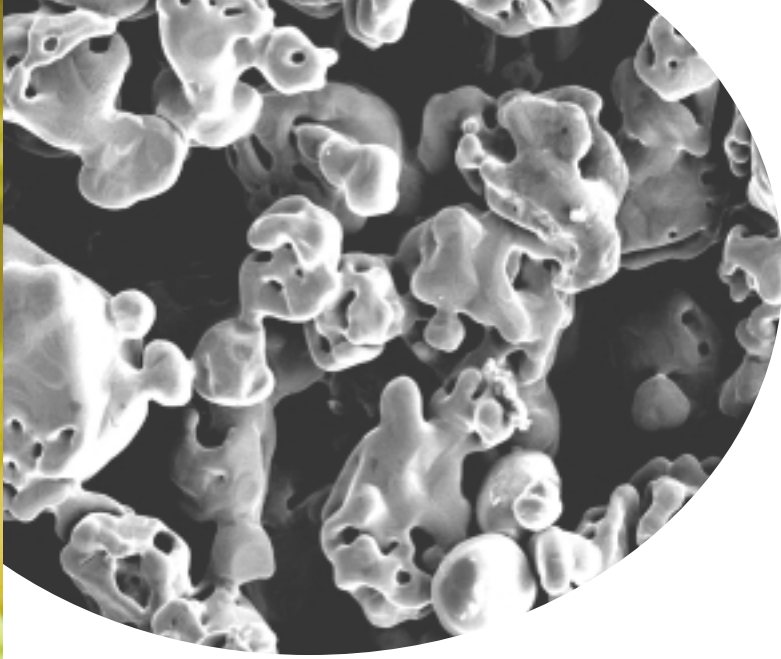


Photo-micrographs of porous iron made from porous iron oxide by reduction in hydrogen.

Vapor-phase sintering opens up the spaces between the large particles, thus enhancing the porosity of the metals.

Next, the CSM team removed the oxygen from porous ceramics to form porous metals. The team found that the properties of the metal filters created were equal to or better than those of the porous ceramic precursor and better than what could be achieved with conventional methods. “The permeability produced from the process is 10 times better than industry standards for a given pore size,” said Readey.

If any of the companies that have expressed interest in the new filtering process want to go forward, it could become integrated into their manufacturing operations in approximately three years, Shoureshi explained. If not, the Office of Technology Transfer has two other options. CSM could create a joint development venture with industry or set up an independent company to build prototypes using the filtering technology. The students who comprised the research team could even become entrepreneurs who bring their discovery to market.

CSM alumni could play an important role in bringing new technologies like the filtering process to commercial applications, according to Shoureshi. They could become an active part of a network that bridges CSM with contacts in industry or the financial world. Some might become “angel investors,” providing the capital needed to fund new companies based on CSM-developed technologies.

A new filtering process that enhances the porosity and permeability of porous metals is attracting attention from the business world.

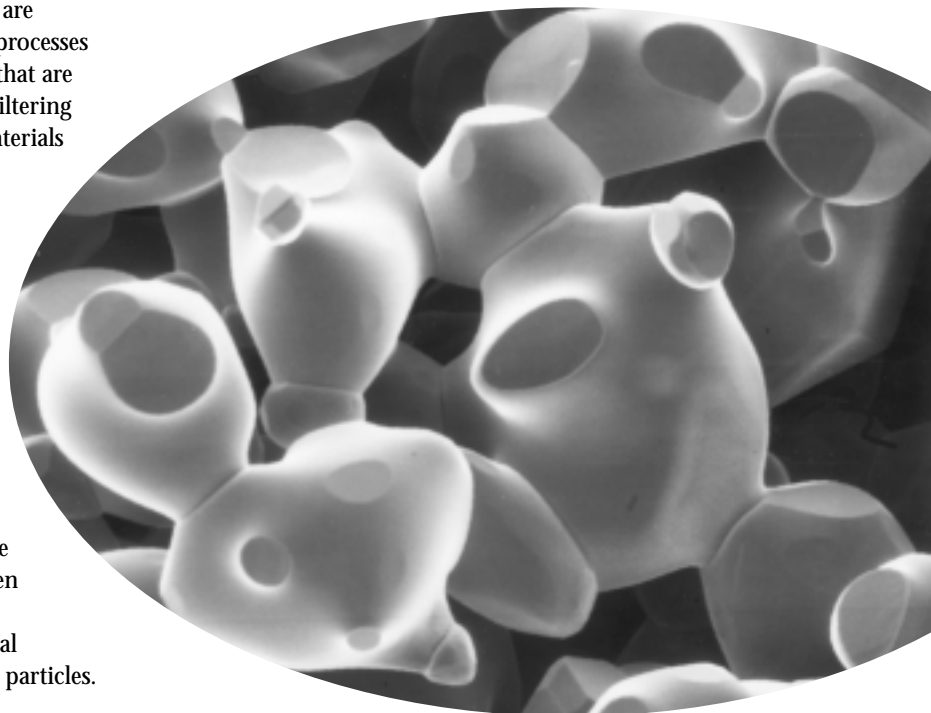
Professor Rahmat Shoureshi, director of the CSM Office of Technology Transfer, reports that five companies – two automotive and three pharmaceutical firms – are potentially interested in licensing the technology for use in their manufacturing operations.

The research team which developed the process was led by Dennis W. Readey (at left), H. F. Coors Professor of Ceramic Engineering in the Department of Metallurgical and Materials Engineering. Other team members included **Steven Landin PhD Mat Sc 96**, **Darin Aldrich PhD Mat Sc 97**, and Marc Ritland.

The filtering process is important because porous metals are prevalent in so many manufacturing and biotechnology processes today. Their tolerances must be precise to filter particles that are measured in millionths of meters. Improvements in the filtering process mean fewer particulates will be evident in the materials produced. For example, better filtration of automotive engine emissions could mean cleaner air and enhanced compliance with environmental regulations.

To produce porous metals for filtering, companies currently sinter (heat to high temperature) compacted metal powder in a normal air atmosphere. The process creates a metal with relatively low porosity and poor permeability. The problem is that when heated, small metal particles grow together, filling in pores and destroying porosity and permeability.

The solution came when the CSM team used vapor-phase sintering in the presence of a reactive gas such as hydrogen chloride (HCl) to preserve the porosity lost during the manufacturing process. The process causes the preferential growth of larger particles and the disappearance of small particles.



Should the oil & of the Arctic National Wild

Yes

Harold Heinze of Anchorage, Alaska, worked for 20 years in the oil industry in Alaska. He has spent 10 years in executive level positions with various companies, including president of ARCO Transportation Company.

There he was responsible for all oil tanker, oil pipeline and terminal operations including the Trans-Alaska Pipeline (TAPS). In addition, he was the TAPS representative for ARCO during the EXXON Valdez oil spill period.

He has worked in government service for the state of Alaska, serving as Commissioner of Natural Resources and as a resource development advisor to the Governor of Alaska. He holds a bachelor of science degree in petroleum engineering from Colorado School of Mines.

According to Harold Heinz, it is already too late to begin drilling in the ANWR, given the instability of the Middle East, coupled with the seven to 10 years needed to bring the first oil to the tap.

The U.S.G.S. estimates ANWR could be another Prudhoe Bay, which could yield about 13 billion barrels through the secondary recovery stage. To put it another way, the yearly output of ANWR could offset the importing of a great deal of Arab oil, say, an amount equal to our annual imports from Iraq.

“One reason we haven’t been even more impacted by Middle Eastern oil politics is the Saudis,” he explains. “Through many crises, they have hung in there with us. But Osama Bin Laden’s real intent is to overthrow the Saudi royal family, which could have an enormous adverse impact on this country.”

The main argument of those who oppose development is the negative effect it could have on wildlife in the area. But as a Mines engineer “trained to solve problems,” Heinz thinks new attitudes and technology could keep the impact to an acceptable level.

He points out that the “footprint” of development in Alaska has shrunk tremendously over the past decade, thanks to economic and environmental drivers being in synch. “Since all facilities have to be enclosed and insulated, it’s to our advantage financially to make them as small as possible. This also minimizes environmental impact. A drilling pad, for example, is one-tenth the size it was 30 years ago,” he said.

The density of facilities would be so small, he argues, “that caribou would have a hard time even finding a drilling rig.” Moreover, there are no caribou alive today who remember the pre-oil Alaska, and the herds are larger than ever.

Young Environmental Symposium

The issue of whether to develop the oil and gas reserves of the Arctic National Wildlife Refuge was debated by a Mines engineering graduate and an Alaskan wildlife biologist during the first annual Young Environmental Symposium.

Held on campus last November, the event is made possible by a gift from Herb and Dodie Young, who “decided in our latter years to use our savings to help protect some of the vanishing beauty and quality of the earth.”

They selected Colorado School of Mines and the National Audubon Society as co-beneficiaries of funds to support public discussion of “the philosophy and ethics needed to live in harmony with nature and create a sustainable-oriented society.”

The event was hosted by the CSM Division of Liberal Arts and International Studies, the Division of Environmental Science and Engineering, and the Division of Engineering.

gas resources life Refuge be developed?

By Leah McNeill



No

John Schoen is the senior scientist for the National Audubon Society's Alaska State Office. He received his Ph.D. in wildlife ecology from the University of Washington in 1977.

Prior to Audubon, he worked for the Alaska Department of Fish & Game for over 20 years, first as a research biologist and later as a research supervisor and senior conservation biologist. His research included 12 years of studies of the forest-habitat relationships in the Tongass National Forest. During his last five years with the Department, he also supervised Alaska Fish & Game's Marine Mammal Program.

Schoen is an affiliate professor of wildlife biology at the University of Alaska and serves on the World Conservation Union's Bear Specialist Group. He has published over 40 scientific and popular articles on wildlife and conservation issues in Alaska.

The development of oil and gas reserves in ANWR would result in major infrastructure that could displace the nesting grounds for the Porcupine caribou herd, in the opinion of Dr. Schoen.

Although Congress has mandated that the footprint of development be limited to 2,000 square miles, it does not have to be contiguous. It's also misleading, he says, because the roads, and the pipelines that would run above ground, would not even be factored into the total.

This "creep of development" could remove the ace from the deck for the animals, he fears, increasing stress on the herd and removing options that could prove critical some day. "We really just don't know enough yet about the caribou and other animals to really protect them," he said.

"This is the only Arctic wildlife refuge in our country, and I don't understand why we have to develop the last 5 percent of Alaska's protected coastline, when minimal conservation could eliminate the need to use it at all," he argues.

According to EPA estimates, if SUVs in this country got three more miles per gallon, it would equal the output of ANWR, he explained.

He calls the national security issue a red herring, countering that the pipeline itself is indefensible: Last fall, a "drunk in a four-wheeler" shot a hole in it and it took 36 hours to plug that one leak.

The bottom line for Schoen is that we can't "drill our way to energy independence." And, he asks, if it is too much to expect from the American public to protect 5 percent of the Alaskan coastline?



From left: Herb and Dodie Young, (center) toast speakers Harold Heinz PE '64 (left) and Dr. John Schoen.



A Metallurgist's Perspective

Textures of nature come alive in Rex Bull's large format photography. As an emeritus professor of metallurgical and materials engineering he feels his two worlds of metallurgical engineering and photography rarely, if ever, meet.

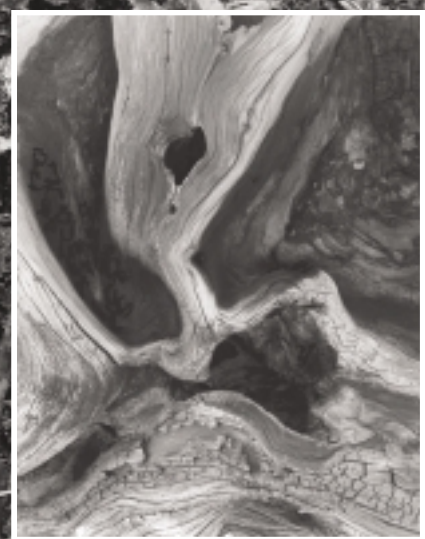
Photography for Rex is a mixture of technique and aesthetics. "If you don't have good technique, you don't have anything...that's the engineer in me talking," said Bull.

"I'm inspired by the work of Edward Weston, Ansel Adams, Paul Strand...who are all famous black-and-white photographers of the '30s, '40s and '50s. In going to all the galleries, I've never seen anything better than the classics except perhaps the work of the Brazilian Delgado," he commented.

"My passions are lighting, texture and composition. For me, a subject has exciting aspects if it fulfills one of these requirements. Photography has taught me how to look at things. Whether or not I take a photo is secondary," he said.

Bull has a rotating exhibit at the Arthur Lakes Library on the CSM campus. For additional information or to purchase a photo contact Rex Bull by email, rbull@mines.edu or 303-278-9862.

By Misti Brady



CHILDHOOD'S END

By Bruce Genereaux MSc Min Ec '89



Fording the river in a Chevy.

The Chevy Suburban skidded and growled down granite slabs and through deep gravels as we descended into Wildcat Canyon, an enchanted wilderness along the South Platte River south of Denver. Our objective, Big Rock Candy Mountain (BRCM), was hidden in the depths of the river canyon. We were headed for Childhood's End, literally and figuratively. Childhood's End is an 11-pitch route up the mountain and climbing it was to be a rite of passage.

I spied a place where other vehicles had forded to the other side of the canyon. Emboldened by the four-wheel drive of my Chevy, I thought little of the consequences of a river crossing. "This rig can make it across a river like that, let's go for it," I said to my climbing partner, Rob. Low range engaged, we plunged down the embankment into the river hoping to glimpse our climb.

The South Platte River drains the Continental Divide. Its water is cold, deep and unforgiving. Halfway across the river and 50 feet from the far bank, the Chevy stalled and lurched to a stop. The beautiful "bow" wave in front of the grill continued on without us. Our fun appeared over. We sat in silence punctuated by the pinging of the cooling engine and the hiss of steam. The water lapped at headlight level. I could reach out the window and touch it. Water seeped through the door at my feet.

We could probably convince fishermen we had passed earlier to pull us out. But if we used our climbing rope to free the Suburban, our climb would be shot. We could walk 15 miles to the nearest house and call a tow truck. But the cost might set me back to my bean burrito graduate school diet. Regardless, my impulsiveness had had an immediate effect: loss of vehicular freedom and the chance to test myself on Big Rock Candy Mountain.

We discussed the effect of frigid river water on electrical systems, hot engine blocks, the resistance of water on the cooling fan and high backpressure on the exhaust system. On the chance that none of those caused the stall, I tried to restart the engine. The starter motor whined and the cooling fan churned water like a stern-wheeler, but after what seemed like minutes, the engine sputtered, coughed and stuttered to life. I coaxed the RPMs higher, spewing frothing, aerated water from under the hood. I threw in the clutch and jammed the gearshift into first. I popped the clutch and burned river gravel till we hit dry land.

"Bruce, look there it is," Rob said, pointing out BRCM. It was back on the opposite side of the river. Rob was still focused on the climb. I was focused on my dripping Chevy.

"No way am I going back across. We have to get out on this side," I said. My desire to have an operating car to get me to work was enough to defer our attempt on Childhood's End till another day.

"I don't see any roads," Rob said. Preparing to do battle with the environment by putting fresh tracks across a pristine forest floor, I replied, "The map shows one on top of that hill. I'm going to try to go up through the woods."

No matter how fast a running start I got before the hill, the Chevy dug itself deep and ground to a stop. I started to feel badly about the damage I was doing to the hillside. My spirits sagged as I reluctantly admitted that fording the river again was my only option. Rob waded downstream a bit and found a shallower crossing spot. This time we crossed without incident.

Now oriented, we drove along the river to a cul-de-sac camping area near the base of the climb. While unwinding over dinner, we set our sights on our intended route: Childhood's End.

I was enamored with the ethical purity with which rock-climbing routes in the South Platte region had been established. All routes were ascended from the bottom to the top. Any protection that was not natural was placed from natural stances on the cliff. Style *mattered* to the first ascensionists

I viewed those who had first climbed these remote granite domes as almost mythical creatures. Their first ascents required bodies and minds hard as steel. I first learned about BRCM in Glenn Randall's 1984 book, *Vertigo Games*, a visual and written portrait of Colorado climbing and its pioneers. Only a few weeks before my attempt on BRCM, I met Pete Williams, the first ascensionist I had read about in Randall's book. He made BRCM sound easy. I aspired to his perspective.

At 1,300 feet long and 1,000 feet high, Childhood's End is the longest rock climb in Colorado's Front Range outside of Rocky Mountain National Park. I wanted the chance to see how I matched up to my idols on what would be uncharted ground for me.

I lay down for the night in the middle of the cul-de-sac with my mummy bag tucked up tight. Rob was nearby, comfortably perched on his \$7.99 MPL (multi-position lounge, a poor man's



cot). I drifted off wondering if I was up to the next day's challenge.

Some hours later I sat bolt upright, screaming. Loud sniffing at my head, foul breath and the presence of a large animal woke me from my dreams. The animal turned tail with deep hackle-raising guttural fear-yelps and ran into the woods. Rob, hearing my feral screams, tried to scramble to our defense but was entangled in his mummy bag, folded up in his MPL and unceremoniously ejected onto the ground.

Being east coast, liberal-educated lads, we didn't believe it was necessary to carry guns, however our thoughts over the next half hour edged toward a more "Live Free or Die" philosophy. The howling and the size of the animal convinced us it was a large canine, maybe even a wolf (though we well knew Colorado no longer has wolves). We talked of posting watches. Finally the "wolf" stopped its howling and pacing. We rested fitfully.

In the morning light we measured paw prints in excess of four inches across. My mood then swung from fear and uncertainty to confidence at having scared off a considerably sized beast that was obviously evaluating easy prey.

Egos pumped from a foiled attack, we made the easy approach to the foot of the climb. So far luck had allowed us to best a river and a wolf. Now it was time to address the metaphoric Childhood's End route.

The beginning of the route didn't look steep. Rob, anxious to begin, climbed straight up, forgoing the protection and security of the route described in our guidebook. Spending nearly all his physical and mental savings buying foot after foot of progress, he gingerly moved along minute depressions and finger-sized ledges while growing increasingly distant from his last protection point. No other cracks or bolts were available till the top of the pitch.

At 80 feet off the deck I called up, "You're looking at a ground fall now." At that moment, it no longer seemed that knocking off Childhood's End would be easy. After whimpers and machinations about the lack of protection, Rob continued upwards, completing the last friction mantle with an audible breath of relief.

The next six pitches got progressively harder.¹ Half-inch crystals and rugosities protruding from a 65° slab characterized the rock



The author's climbing partner, Rob, climbing BRCM.

on these pitches. There were three to five bolts per 100- to 150-foot pitch. The consequence of a fall would be a 60-foot tumble and slide before Rob could catch me with the rope. I doubted I'd be badly hurt if I fell. The possibility sharpened my senses and made me conscious of each step, but didn't overshadow the experience. I loved being high up, looking down at the river, and feeling the wind in my hair and the sun on my shoulders.

At pitch seven we broke out our "cheater" stick, an elongated tent pole with a carabiner on its end. Designed for surmounting too-hard-for-me sections, we used it to aid the next pitch, the route's 5.12 crux. I knew the first ascensionists

would never have used such a style, but our lack of ability led to a success-over-style ethic.

After the lead I waited, suspended by nylon slings on the nearly vertical, smooth face held by carabiners clipped to two quarter-inch bolts adorned with rusty hangers, while Rob jumared² up. It was here – 700 feet above the river – I began to appreciate what I was completing. Below was a nearly smooth apron of rock that curled downward out of sight to reveal the meandering river backdrop. Only two rusty bolt hangers that flexed with each of Rob's jumars held us. I willed myself to relax and accept as the price of upward progress the queasiness of seeing the metal fatiguing before my eyes. So I looked away.

The view outward from my tenuous perch was soothing. I saw typical South Platte scenery – evergreen trees spread below like ocean waves from which domes called Sheepshead, Wigwam, and Sunshine surfaced and through which the river carved a meandering, sometimes tumultuous, passage. Above me was the candy-striped section of Big Rock Candy Mountain up close for the first time. There, four-foot wide water grooves, smooth except for half-inch protruding crystals, descended steeply down 500 feet from the summit. My sweet tooth for adventure pulled me upward.

Shortly Rob joined me, collected himself and cast off from our belay. He stemmed up one of the symmetric water grooves using single crystals to gain bolts spaced every seven to 10 feet. With no positive holds to grip as I followed, my feet smeared across the rock and my hands clawed at fingertip- and fingernail-sized holds. Wind gusts threatened to pry me loose. It was taking more and more guts to continue upwards. With the climbing just below my

limit and no threatening weather, the only thing causing me to contemplate retreat was the unsettling prospect of the lack of protection and exposed setting hundreds of feet up the cliff.

From the belay at the top of Rob's last lead where we now rested I looked up at the next pitch. I saw only four bolts: two in front of my nose and two 150 feet higher at the next belay. The lack of bolts between us and the top of Childhood's End implied a maximum fall of 300 feet if I lost my footing just below the upper bolts – a prospect exponentially more daunting than the 60-foot fall I'd faced below.

I considered what was before me. No, I wouldn't die if I fell, but surely the injuries would be career limiting, and who would care if I succeeded? These days my self worth was measured increasingly by rock climbing. Ascending these horrendously long run out pitches would mean I had passed Childhood End's test. I took the lead.

I climbed at first very carefully, testing each foot's smeared placement for there were no handholds at all now. The wind threatened my tenuous friction. As I moved upward, the length of my potential fall increased. Instead of tightening up and letting thoughts of the consequences impede my progress, I climbed faster and more fluidly the further I got from Rob's belay. Each step became less encumbered by concerns about falling as I became more committed to my venture. It was just the rock and me.

By the end of the pitch I moved with continuous motion, a rare occurrence for me rock climbing. On reaching the belay I felt giddy. I had proven I could climb without protection and I found it liberating. Here, with no reason to slow down, I had found a fluidity of motion on the rock heretofore not experienced except during ski races.

The parallels of this freedom to life's traditional rites of passage are easy to find: leaving home for the first time or getting your driver's license. The rewards of freedom require risk. I felt empowered with my ability to overcome both the physical and psychological challenges of this climb.

Two more protectionless 5.6 pitches led to the summit. Rob let me lead both. I couldn't get enough of flexing my muscles on this smooth rock. While I hadn't reached any physical edge, I had jumped a psychological barrier and was imbued with confidence to test the next barrier.

Breaking out of the reverie of our success on Childhood's End, we rappelled 200 feet down the backside of BRCM where we grabbed previously hidden mountain bikes and ripped a speedy descent to



Big Rock Candy Mountain

the car. After driving about five of the 15 miles out of the canyon, we happened on a lone hound dog, dragging ass up the road. The dog skulked over to the car and whimpered a bit.

Rob looked at me and said with a sheepish grin, "I bet this is the 'wolf' from last night." One look at the dog revealed the hyperbole of our fears. This wolf-sized animal now looked more like dehydrated mountain lion bait.

We loaded the wolf-turned-hound into the back of the Chevy and gave it water and our last peanut-butter-and-jelly sandwich. Five miles later we met another Chevy.

"Did you guys see a brown hound dog?" the driver asked. We pointed to the back of our van. "I've been looking for that dog since last night. It's my roommate's 6-month old puppy."

Bruce Genereaux is an independent project manager, resource economist and adventure sportsman. He was an NCAA Division I ski racer, is a 5.10 rock climber, Class V kayaker and a competitive mountain biker and distance runner. This article is excerpted from his soon-to-be published book, *Beyond the Comfort Zone: Limits of Acceptable Risk*, in which more risk-loving adventures of the author and some of his like-minded CSM graduate/friends are examined. Preview more of the book at www.mysterymove.com.

1 Rock-climbing difficulty ratings range from Class 1 through 5. Within Class 5 are subdivisions from 5.0 (easiest) to 5.9 and then move upward in subjectively harder, but mathematically illogical, ratings 5.10, 5.11, up to 5.15. BRCM's lower pitches rate between 5.7 and 5.12. Its final three pitches are rated 5.6. Any Class 5 climb necessitates a rope to arrest a fall. Most reasonably fit people could climb a route rated up to 5.4 their first time out.
2 A means of ascending just the rope with mechanical one-way devices.

JAMES G. BALLARD EM '36 died Sept. 26 at age 86. After graduation from Mines, Ballard was employed in civil design at the U.S. Bureau of Reclamation. He was a member of Berkeley Presbyterian Church. His interests included hunting and fishing. Ballard was preceded in death by his first wife, Grace and second wife, Leah. He is survived by a son.

CHARLES T. BARRY M Eng Geop '80, of Golden, died Aug. 31 at age 64. After graduation from Mines, he attended Aviation Electronics and Avionics school. He was a Navy lieutenant during the Vietnam War. He was a member of Mensa, AOPA, Society of Exploration Geologists, American Institute of Aeronautics, Society of American Military Engineers, American Geophysical Union and was active in the Alumni Association. He was vice president of Terra Concepts. In 1987 he married Barbara Lane Stoneback. Barry is survived by his widow, two sons, a stepson, two brothers, six grandchildren and one great-grandchild.

EINAR T. "TED" BENSON EM '33 died Sept. 5 at age 92. He was born in Victor, Colo., and served as a major with the Army Corps of Engineers. In 1933, he married Mary Warren, who preceded him in death. He was made an honorary member of the Alumni Association and was named Outstanding Alumnus in 1990. In 1994 he was awarded the Melvin F. Coolbaugh Memorial Award. He was a member of the Mount Vernon Country Club. Benson is survived by a son, a daughter, six grandchildren and three great-grandchildren.



ELMER BLAKEY Geol E '53 died Sept. 5. He was a self-employed engineer for Golden Engineering Inc. During World

War II he served in the Marines. He married Emma Christie. Blakey is survived by his widow, three sons, a sister, 13 grandchildren and three great-grandchildren.

WAYLES BAKER BRADLEY MSc Geol '51 died June 5 at age 75. He was born in Ohio and raised in Alabama. During World War II he served in the U.S. Air Force. He received his undergraduate degree from University of Pittsburgh. In 1955 he graduated from Georgetown University of Foreign Service. Apart from three years with the U.S. Geological Survey in Washington, D.C., he spent his working life overseas. Bradley worked for Creole Petroleum Corp. in Venezuela; then Sahara Petroleum Co. in Egypt; and finally Oasis Oil Company of Libya. He retired to England in 1986. His widow, Jean, four children and a sister survive him.



WILLIAM L. CONNELLY Pet E '53 died Sept. 24 at his farm in Kansas at age 71. He was retired president of AB Sales and a veteran of the Korean War. While at Mines, he participated in swimming and track and field. He was a member of Rotary, Sigma Alpha Epsilon and the Alumni Association. Connelly was an avid golfer and sportsman who enjoyed hunting and fishing. He is survived by his widow, Martha, two sons, a daughter, two stepsons, a stepdaughter, two brothers, two sisters, four grandchildren, and a step-granddaughter.

EUGENE E. DAWSON Pet E '38 died June 30 in Stockton, Calif., at age 84. He was a petroleum engineer for 47 years. He was vice president and general manager of the American Independent Oil Co. in Kuwait, then served as a consultant for Natomas Co. in San Francisco. During World War II, he served in the Army. He was a member of

S.I.R.S. No. 87, St. John's Episcopal Church and Oak Park Senior Center. Dawson is survived by his wife, Rae, a son, a daughter, and three grandchildren.

ATHANAS Z. DIMITROFF EM '39 died Aug. 31. He was 88. Dimitroff, of Golden, was born in Bulgaria. He married Gwen Barker, who preceded him in death. In 1966, he married Mildred Sherrill. He worked the U.S. government as a mining engineer. He belonged to the Masons, Lakewood Country Club and Applewood Valley United Methodist Church and was a senior member of the Alumni Association. He is survived by his widow, a daughter, a son, a stepdaughter, five grandchildren and three great-grandchildren.

EDWARD W. ELY Geol E '50 died at his home in The Woodlands, Texas Oct. 14. He was 79. Ely was retired from Transco Energy Company after 27 years, and in 1987 retired from Fina. While at Mines, he was a member of the track-and-field team and received his ROTC commission upon graduation. He taught countless friends and family to fly, sail, water ski and ride motorcycles. He also taught GED classes at Northwest Assistance Ministries. His first wife, Mary, preceded him in death. He is survived by his wife of 21 years, Genevieve, two daughters, a son, a stepdaughter, a brother and numerous grandchildren and great-grandchildren.



ROBERT F. EVANS Met E '48, of Durango, Colo., died Aug. 8 of prostate cancer. He was 78. Evans was an inventor and held many patents pertaining to oil engineering. He was also a sculptor and enjoyed fishing and the outdoors. During World War II, he served in the U.S. Navy. Evans is survived by a son, two daughters, two sisters, and five grandchildren.

In memoriam

RAYMOND M. EVENSON Geop E '51 died peacefully at home in Wisconsin May 11 after a long battle with leukemia. "He was so proud of the time spent at CSM," says his widow Patricia. "Not merely achieving his degree, but Ray carried the entire enriching experience with him always." In addition to his widow, he is survived by a daughter, two granddaughters, and two sisters.

KENNETH R. FENWICK EM '36 died Oct. 11 at age 91. Fenwick, who lived in Golden, Colo., attended many of his class reunions including his 50th and 65th. While at Mines, he was a member of Sigma Alpha Epsilon. He was a registered Professional Engineer and land surveyor and a Colorado state representative from 1948-1962. Fenwick was also a Mason. He is survived by his partner, Mary Martensen, a daughter, a son, seven grandchildren and 15 great-grandchildren.

SUZANN D. HANDFORD BSc Eng '76 died Jan. 2, 2001 in Boise, Idaho, after a 14-year battle with cancer. While still a student, she married Bob Handford BSc Min '76. During her career, she worked on the original Strategic Petroleum Reserve on Weeks Island, La. In West Virginia she was office manager for Frontier Kemper Constructors. In Utah, she and Bob were two of the founding members of Meridian School, a successful, parent-directed private school for pre-Kindergarten to grade 12. Handford was a parent volunteer, then administrative manager. She enjoyed traveling, playing games, camping, reading and her children's activities. She is survived by her husband, a daughter, a son, her parents, and two brothers.

CALVIN A. KELLEY Geol E '53 died in September at age 78. He was a general contractor at the time of his death. He was a homebuilder and developer in Golden, Colo., for 53 years. During World War II and the Korean War, he served

in the U.S. Air Force. He is survived by his widow, Phyllis, a daughter, two sons, 12 grandchildren and one great-grandchild.

GEORGE A. KIERSCH Geol E '42 died Oct. 19 of congestive heart failure in Tucson, Ariz. He was 83. Kiersch, a former professor and department chairman at Cornell University, was a leading figure in engineering geology. Early in his career he alternated teaching with stints as a field geologist in the western United States. In the 1950s he supervised a comprehensive survey of mineral resources on Navajo and Hopi Indian reservations. He also studied underground steam around Salzburg, Vienna, and investigated a dam disaster in Italy that killed more than 2,000 people. He served in the U.S. Army Corps of Engineers and received a Ph.D. in geology and mining engineering from University of Arizona. Last year he received the prestigious Palmes Academiques in France for his work in Europe. Kiersch is survived by three daughters, a son, two sisters and 10 grandchildren.



ROBERT E. "MIKE" MICHAELIS Met E '47 died last year at the age of 79. During World War II he served in the Army Air Force. He was a technologist for U.S. Steel Corp.,

and then was a general scientist for the National Bureau of Standards. Most of his work involved metal and inorganic standard reference materials. He presented dozens of reports, technical papers and speeches in his field of expertise.

JOHN C. MITCHELL Met E '39, a mining engineer, died Sept. 13 in Alamosa, Colo., at age 92. In 1934, he married Jeanne Burroughs, who preceded him in death. During his career, he taught at CSM and owned several businesses including

the CFO Furniture Store in Colorado Springs, Colo. He was also the original owner of Mitchell Drilling in Alamosa. His hobbies included fishing and gambling. Mitchell is survived by a daughter, a daughter-in-law, nine grandchildren, 23 great-grandchildren and two great-great-grandchildren.

LOUIS C. PAKISER JR. Geol E '42 died Oct. 30 of complications from a fall and pneumonia. He was 82. Pakiser was a geophysicist for the U.S. Geological Survey where he helped create the National Center for Earthquake Research. He wrote more than 100 technical papers and a book about the earth's crust. He was an avid hiker and fly fisher. But his real passion was helping minority youths succeed. He was a relentless promoter of scholarship programs for minority students and employed several top students from metro Denver high schools each summer. He will also be remembered for his huge, hearty laugh. Pakiser is survived by his widow, Helen, and five sisters.

F.T. "TERRY" QUIETT Geol E '50, MSc Geol '51 died June 3 at age 80. While at Mines, Quiett was student body treasurer and a member of Tau Beta Pi and Sigma Gamma Epsilon. He was owner of New World Exploration Co. for several years after graduation and successfully ran several mining operations. He later worked for Perini Mining Exploration and was a consultant in the United States and Mexico. Later he was professor of engineering and associate dean at San Diego State



University. He earned a law degree and his fields of interest were federal land boundaries and patents. Quiett was a pilot and flew for consulting and recreation. He was a member of the Navioneers, Baja Bush Pilots and Soaring Society of America.



MICHAEL A. REMMERS BSc Geol '82, MSc Geol '93 died Oct. 9 in Golden, Colo. He was 42. He was a member of Sigma Phi Epsilon and was an analytic chemist

for Hazen Research. He attended his 10-year class reunion in 1992. Remmers is survived by his mother, father, stepmother, brother and sister.

CHARLES E. SCHWAB PE '69 died Aug. 6. He had worked for Questa Oil & Gas Company and was vice president of Occidental Petroleum Corp. While at Mines, he was a member of the Alpha Tau Omega fraternity and played baseball. He is survived by his widow, Jessica, a daughter, his parents, two brothers and a sister.

EUGENE H. SMITH Pet E '43 died Oct. 24 in Seattle at age 80. He had relocated to Washington in March after 50 years in Idaho Falls, Idaho. He achieved the rank of captain in the U.S. Army during World War II and served in the Corps of

Engineers. He performed with distinction in many battles including Normandy and received the Bronze Star. He married Phyllis Burnett in 1946. They divorced in 1977. Smith was the reactor manager for Phillips and successive companies. He retired from WINCO in 1986. He was an avid golfer and loved to travel. He was a member of Sigma Phi Epsilon and the Alumni Association. Smith is survived by a daughter, a son, a grandson and a brother.



by Dresser Industries and was a member of the First Baptist Church of Spring Branch, Texas. He is survived by his widow, Lois, two sons, four grandchildren and a sister.

HERMAN M. TROY PE '30 died March 26 at age 93. After graduation from Mines, he worked at various mining companies until being drafted during World War II. After serving in the Army, he moved to Michigan to work for the Penn Central Railroad System for 30 years. Troy is survived by his widow, Terrie, stepchildren and grandchildren. "Herman will be missed greatly by all who knew him," says Mrs. Troy.



MARTIN L. TALLEY PE '49 of Houston died July 7 at age 77. Born in Texas, he attended Texas A&M before joining the Eighth Air Force 801st/492nd Bomb Group during World War II. Afterward, he attended and graduated from Mines. He was employed

War II. Afterward, he attended and graduated from Mines. He was employed

Also in Memoriam

PAUL W. BILLWILLER EM '39
4/4/01

JOSE DE MORAES Met E '48
9/2001

LUTHER S. HELMS EM '41 2001

MATTHEW J. KAPUSHION PRE '70
Unknown

DAVID M. MATHEWS PE '50
2001

DOUGLAS E. NEWTON Met E '48
8/26/99

ANDREW E. PERRY PE '37 9/17/01

LUTHER S. ROBBINS Geol E '34
9/14/97

ALBERT E. TARBOX Geol E '36
8/9/01

CLYDE W TURNBULL PE '31
6/16/91

JAMES E. WADE PE '48 9/1/99

KENNETH A. WAGNER PE '57
8/01

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Alumni Notes & quotes

Banfield '64 wins award

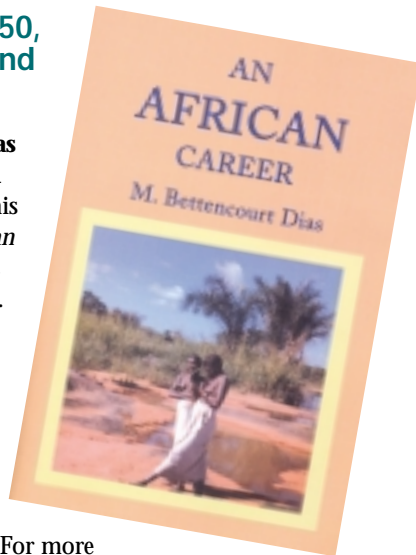


Mintech Inc., founded by **A. Frederick Banfield EM '64, Dist. Achievement Medal '01** and William L. Meyer in 1970, has been awarded the American Mining Hall of Fame 2001 Industry Partnership Award. Mintech provides computer-aided consulting services for geologic modeling and engineering tasks for mining engineers and geologists. Its software is used for mine evaluation, reserve calculations,

short-range and long-range planning and surveying. MineSight®, 3-D visualization and CAD program software, is used by more than 300 mines and consulting groups around the world.

Bettencourt-Dias '50, '51 publishes second autobiography

Manuel Bettencourt-Dias Geol E '50, MSc Geol '51 has written part two of his autobiography, *An African Career*. Bettencourt-Dias grew up in Mozambique. He was the first young man from that country to receive a scholarship to an American mining school, CSM. This book tells the story of his stay in Colorado and his return to Africa. For more information, check out the publisher's website at www.iuniverse.com.



Preble '61 joins development firm

KUD International LLC, a global development firm that specializes in complex public/private development projects, has appointed **Laurence G. Preble PRE '61** director of development.

Preble previously was senior real estate partner at the law firm of O'Melveny & Myers, where he headed the firm's real estate department and was a member of its management committee.

"Larry's extensive experience in structuring and negotiating complex, mixed-use projects and his knowledge of the real estate industry will increase our opportunities and extend our global reach," said Marvin J. Suomi, KUD president and CEO. "We are delighted to have him on board."



KUD coordinates all aspects of development, including selecting architects, engineers and other consultants; obtaining permits and other entitlements; engaging general contractors; and managing construction. Recent projects in the United States include Pacific Bell Park in San Francisco, home of the baseball Giants; the Long Beach (Calif.) Aquarium; and the Florida Aquarium in Tampa. KUD currently is developing the new Philadelphia Eagles Stadium in Philadelphia, scheduled to open in 2003.

Chockie '49, '50 honored by ASME

Lawrence J. Chockie Met E '49, MSc Met '50, president of Chockie Consulting Services, received the American Society of Mechanical Engineers International's Melvin R. Green Codes and Standards Medal for his dedication to the development, technical excellence and international recognition of ASME codes and standards. The medal honors outstanding contributions to the development of documents, objects or devices used in ASME's program of technical codification, standardization and certification.



For more than 50 years, Chockie has served in various capacities on many codes and standards writing committees, both nationally and internationally, addressing the safety of pressure retaining equipment in the nuclear industry. His major achievement was chairing

the committees that developed the requirements printed in Section XI of the ASME Boiler and Pressure Vessel Code. These rules have been adopted by many nations operating nuclear power plants and are used by other industries to preserve safety and keep operating costs down.

NASA honors Smith '84 for leadership

Dennis E. Smith CPR '84 received the NASA Outstanding Leadership Medal for his achievements and contributions to America's space program. Smith is manager of the Space Launch Initiative Program at NASA's Marshall Space Flight Center in Huntsville, Ala. The award is given to individuals for notably outstanding leadership that has a pronounced effect on NASA's technical or administrative programs.



The Space Launch Program headed by Smith is aimed at developing the advance technology and design capability needed to build a new space launch system that can be safer more reliable and less costly than today's space shuttle. Every NASA center, the U.S. Air Force and numerous contractors across the nation are participating. The \$4.85 billion program will demonstrate critical advances in technology so that NASA will be able to begin building the new system by the middle of the decade and begin flights early next decade.

Remember the 'good ol' days'?

Get together with old friends at your class reunion! The following people have already signed up:

1942

Robert Bernstein
Roland B. Fischer
William A. Mays
Ward O'Malley
Eduardo J. Regalado
James E. Schmuck
Robert H. Shanley

1947

M. John Bernstein
Charles A. Einarsen
Bernard J. Ferris
Richard A. Ganong
William W. Owens
Earl Rau
Frank Seeton



Last year's all-alumni dinner was a lot of fun.

1952

Ralph E. Anderson
Millard E. Benson
Carl Bochow
Kelly (Richard) F. Bolender
Dunston "Dusty" Boyd
Jim Bright
Bart J. Burns
Stewart Cecil
Charles A. Champion
Douglas Cook
John C. Dingman Jr.
Jack S. Diskin
Charles J. Diver
Thomas J. Ellis
Franklin Frederick
Weldon G. Frost
Laurence H. Gardner II
Robert F. Garland Jr.

Ray Govett
Jack J. Grynberg
Joseph Hill
Lawrence Howenstine
Donald T. Klodt
Keith A. Kvenvolden
Drexel L. Lee
Craig Malin
Patrick P. McCall
Charles "Chuck" McCollough
Thomas M. McLaren
Robert F. McMahon
James "Jim" H. Ogg
William F. Oline
Robert M. Pozzo
Kenneth T. Seibert
Eugene D. Smith
James "Jim" E. Stroh

Tom Warfield
Douglas Waterman
Richard "Dick" Wendeborn

1957

Robert Beckman
Stan Beitscher
Ralph L. Bradley
Jim Classen
John I. Coats
Cecil I. Craft
Mary (McGill) Edwards
John E. Hoffman
Buddy D. Ratliff
James F. Rucker
Dave Smink
Allen Spelman
W. A. Thompson

1962

John P. Chase
L. Duncan Creed
Charles W. Downing
Stephen J. Force
John D. Macfadyen
Will Pitman
Allan Provost
Richard Richards
William Sharp
Les Ludlam

1967

Charles M. Albrecht

1972

Nelson D. King
Richard Laman
John "Jack" Neubauer

1977

David Chazin
W. Durand "Randy" Eppler
Terry Evans
Kathleen Wiltsey

1982

Lynn Ayers
Christopher Beck
Matt Berghorn
Dennis A. Caruso
Kevin W. Conroy
Pat Gallagher
Barbara Ganong
Pablo Hadzeriga
Sandra Sullivan
Fredric "Ric" Woldow

1987

Carlos Ballon
Linda Battalora
Cho Huna Cheung
M. Khaldoun Hejazi
Jim Kneedler
Scott Noland
Richard Reuter
Theresa Wisda

1992

Toni S. Clifton
Jamie (Burns) Evans
Vicky Jackson Nielsen
David Kalman
Aimee Oltrogge-Trombley
Andrew R. Smith
Denise Michele Thomas
Karen Whiteman

Mines Honors Members of the Century Society

During 2001-2002 homecoming weekend, October 26 and 27, Colorado School of Mines inducted new members and honored current members of the Mines Century Society. The society recognizes individuals whose lifetime of giving to the School exceeds \$100,000. Fifty-six members of the 163-person Century Society returned to campus for a series of events, including a recognition dinner, tours of the Center for Technology and Learning Media and the Center for Commercial Applications of Combustion in Space, the homecoming parade, a breakfast before the homecoming game, and the homecoming game itself.

Century Society members were joined by 14 members of the 50-person Simon Guggenheim Society, which recognizes individuals who donated \$25,000 or more to the School in the past year.

In addition, Jerome and Rebecca Broussard and Robert and Stasia Davison were honored for donating more than \$1,000,000 each to the School in 2000-2001. The couples each received replicas of Robin Laws' sculpture, which stands outside Guggenheim Hall, of two burros laden with mining gear.

Members Recognized at the Mines Century Society Dinner October 27

Jerome T. Met E 63 and Rebecca Broussard Family
Allan Caplan*
Virginia B. Case*
James D. and Allis V. Corbett*
James R. Geol E 51 and Patricia A. * Daniels
Robert P. Geol E 43 and Stasia Davison
Bart P E 30 and Helen Ryan De Laat*
Charles J. Diver P E 52
Joseph R. Dunbar P E 56
Eunice I. Fettes*
Bruce E. Grewcock Bsc Min 76
L.F. Ivanhoe
Claude B. Geol E 52 and Barbara A. Jenkins
Louis L. Phannenstiel P R E 54
Paul S.* and Helen M. Pustmueller
Robley F. Geol E 26 and Elizabeth Sopris*
Thomas M. Geol E 51 E M 56 and Frances E. Valente
Charles V. Met E 44 and Shirley M. Woodard
Anonymous Member

*deceased



Mines President John Trefny presents **Jerome Met E 63** and **Rebecca Broussard** (left) and **Robert Geol E 43** and **Stasia Davison** replicas of Robin Laws' "A Friend to Lean On" sculpture in honor of their million-dollar level gifts to the School.

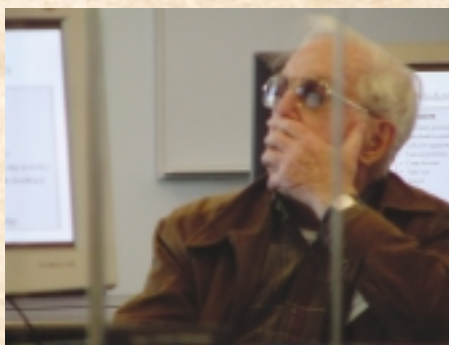


Eugene McMahan Geol E 49, **Jerome Broussard Met E 63**, **Art Dyson P E 51**, **Margaret Dyson**, and **Bob McClevey E M 32** (l to r) stand before a wall of art during a tour of the Center for Technology and Learning Media.





Mines student Jessica Evans presents a copy of Isaac Newton's *The Principia: Mathematical Principles of Natural Philosophy* to renewing Guggenheim Society member, **Nor Hannon Geol E 47**.



Bob McClevey ponders a lesson given by Professor Tom Furtak during the tour of the Center for Technology and Learning Media.



Philanthropy at Mines

Colorado School of Mines received more than \$25,000 from each of the following donors between August 21, 2001, and November 8, 2001:

Individual Gifts

With their gifts, these individual benefactors will join or renew their membership in the Simon Guggenheim Society, a distinguished group of Mines alumni and friends who donate \$25,000 or more to the School in a given year. In many cases, the donors' gifts earn them membership in the Mines Century Society, which honors alumni and friends whose cumulative contributions to the School total at least \$100,000 or more.

Robert F. Bowie E M 42, a member of the Mines Century Society at the copper level, established a charitable gift annuity, his fourth, with a contribution of \$100,000. The gift is in honor of his 60th-year reunion celebration.

An additional distribution of \$200,000 was received from the estate of **Bart P E 30 and Helen De Laat**, bringing total distributions to nearly \$1.5 million. The bequest is funding the De Laat Scholarship at Mines.

President emeritus **Guy T. McBride, Jr.** established a flexible gift annuity with a contribution of appreciated securities in excess of \$150,000. Already a member of the Mines Century Society at the copper level, McBride joins the Simon Guggenheim Society for 2001-2002 with his latest gift.

William A. Preston Geol E 58 joined the Simon Guggenheim Society of the 2001-2002 President's Council with a gift of \$25,000 to the Renewal Fund, an endowed scholarship fund. Preston is a member of the Mines Century Society at the gold level.

A bequest distribution of \$80,000 was received from the estate of **Wilhelmina Siegert** to establish the William C. Siegert Endowed Fellowship Fund.

A distribution of \$1,000,000 was received from the estate of **Elizabeth Sopris** to establish the Robley F. and Elizabeth R. Sopris Scholarship Fund. **Robley Sopris** graduated from Mines in 1926 with a degree in geological engineering.

Corporate Gifts

The Denver Chapter of the **ARCS (Achievement Rewards for College Scientists) Foundation** contributed \$30,000 to support six scholarships for the 2001-2002 academic year.

The **Environmental Studies Group** contributed \$100,000 toward a pledge by Infiltrator Systems to support Dr. Robert L. Siegrist's research and educational activities in the area of onsite and alternative wastewater technologies.

With a gift of \$25,000, the **ISS Foundation** contributed to the ISS Foundation Ferrous Metallurgy Grant Program Professor, Dr. John Speer.

The **Phelps Dodge Foundation** is supporting six undergraduate scholarships for the 2001-2002 academic year with a gift of \$30,000.

Phillips Petroleum Company donated \$124,000 to support the following: student scholarships and activities for the Phillips Scholars Program; graduate fellowships in geology and geophysics; departmental and scholarship support for the departments of Geophysics, Petroleum Engineering and Chemical Engineering; the Minority Engineering Program; and the Career Center.

Wells Fargo Bank is supporting the CSM Athletic Department with a \$26,000 gift for the construction of an indoor baseball facility.

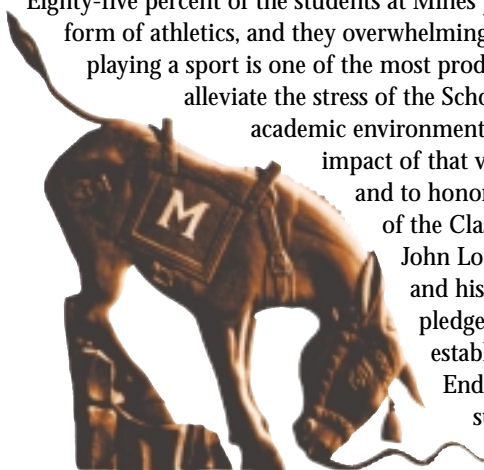
Blaster Scholarship Supports Students, Athletics, and Excellence at Mines



John Geol E 52 and Erika Lockridge

Disciplined. Persevering. Determined. Focused. Competitive. For those who know Colorado School of Mines, the terms conjure the image of a successful Mines student. And for current and former Mines student athletes, they also describe what it takes to succeed against an opponent.

Eighty-five percent of the students at Mines participate in some form of athletics, and they overwhelmingly assert that playing a sport is one of the most productive ways to alleviate the stress of the School's intense academic environment. To advance the impact of that valuable resource and to honor the 50th reunion of the Class of 1952, alumnus John Lockridge Geol E 52 and his wife Erika recently pledged \$1,000,000 to establish the Blaster Endowed Scholarship in support of non-resident basketball



students at Mines. They've also contributed more than \$16,000 in current funds to initiate the scholarship immediately and accelerate the benefits of their gift.

"I can't say enough about the generosity of the Lockridges and other contributors to athletics at Mines," Mines President John U. Trefny said. "We pride ourselves on molding our students into active, well-rounded graduates. Athletic competition, both intercollegiate and intramural, is a critical component of that endeavor and an important focus of campus life."

The first student to receive the Blaster Scholarship is Ryan Thomas Woodson, a freshman majoring in mechanical engineering from Rogers, Arkansas. Like most of the students who participate in athletics at Mines, Ryan plays a sport because he believes that competing helps him to get good grades and "still remain sane." He notes that basketball takes his mind off his studies, and he hopes that future employers will appreciate his experience working on a team.

Ryan has been playing basketball since he was in the fifth grade. In the ninth grade, he only played three minutes per game. The experience turned out to have a significant influence on him.

"I saw it as a challenge, which is what I excel at. You put a challenge in front of me and I engage in overcoming it," he said. That tenacity and ambition resulted in his decision to attend Mines. Although he was offered full-tuition awards from three other schools, he decided to attend Mines with only a partial-tuition scholarship—that is, until he received the Blaster Scholarship when it became available in September. "CSM has a reputation for being a really tough school," Ryan said, "and I may have received less money at first, but Mines is the best for engineering."

Given his family background, Ryan is in a good position to know. His father is a civil engineer, and his mother is a pediatric physical therapist. His mother's work showed him how artificial limbs can make a tremendous impact on people's lives. Consequently, Ryan hopes to pursue a career in biomedical engineering. When considering Mines, he found himself particularly intrigued by research on campus to develop a device that can help people with

diabetes prevent amputations. He was also thrilled to be able to continue playing the sport he has come to love.



Wearing number 16, John Lockridge plays basketball for Mines in 1951.

Donors Erika and John Lockridge both know firsthand the value of athletics. John played basketball during high school, throughout his four years at Mines, and in town leagues following graduation. Erika was born and raised in Germany and learned to play basketball from Americans who were stationed there after the Second World War. The couple still enjoys using the basketball net in their backyard.

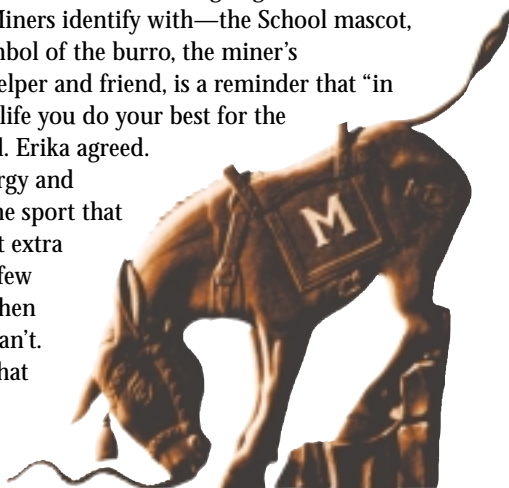
With their love for the sport, the Lockridges considered a basketball scholarship a fitting way to support a program that substantially enriches campus life and can be enjoyed by students, alumni, and the local community. Their primary motivation in making the gift, however, was to provide an opportunity for capable young people from across the country to attend Mines.

Like Ryan, John came to Mines from out of state—in his case, Marshall, Missouri. “I was able to attend Mines on a scholarship program for out-of-state students provided by the state of Colorado, and I have always been grateful for that opportunity,” John

said. That experience influenced the Lockridges’ decision to designate the Blaster Scholarship for non-resident students. “We believe that geographic diversity can be a positive component of a strong and interesting student body.”

It is no coincidence that the Lockridges’ gift was named after something all Miners identify with—the School mascot, Blaster. The symbol of the burro, the miner’s indispensable helper and friend, is a reminder that “in basketball as in life you do your best for the team,” John said. Erika agreed.

“There’s an energy and excitement in the sport that help you go that extra mile in the last few minutes even when you think you can’t. You can apply that to life.”



Phillips Scholars Program Connects Education and Experience

For as long as the world has been connected, Mines has been known for its global impact and international reach. So it’s no wonder one of the School’s strongest supporters shares a similar profile. For years, the fully integrated and omnipresent Phillips Petroleum Company has been a positive force in the Mines educational system by hiring graduates of the School. Since 1998, Phillips has also made a difference via the Phillips Scholars Program before the students graduate.

“Corporations are the unsung heroes in the development of successful employees and productive members of society,” said Colorado School of Mines President John U. Trefny. “They provide the consistent, dependable funds that Mines in particular needs to offer a superior technical education to a world of qualified students.”

The Phillips Scholars program now includes 12 students. The best and the brightest that Mines has to offer apply and interview for the Phillips Scholars Program in their freshman and sophomore years. Once selected, the successful students receive scholarships, mentorship support, and the opportunity to obtain paid internships. The company remains involved in their academic and professional development until the students graduate.

In return, Phillips produces an experienced applicant pool, which is a great advantage to a company that has been recruiting employees from CSM for years. Currently Phillips employs 89 Mines graduates. According to Celine Long, Phillips’ College Relations Representative, Phillips’ corporate philosophy with regard to college relations is not to support bricks and mortar, but rather the student population where “the true assets are.”

The Phillips Scholars Program is designed to bridge academia with the work environment. Forest Bommarito is a petroleum engineering junior and Phillips scholar since 2000. “Even though I had only taken one petroleum engineering class, I was in the field gaining actual reservoir engineering experience,” he said. “The next semester, the things I was reading about, I had already done!”

With oil and gas properties in 26,000 retail outlets in 48 states and 21 countries, Phillips Petroleum Company is one of the five largest oil and gas exploration, production, refining, and marketing concerns in the world. The company also processes and markets natural gas liquids and produces petrochemicals and plastics. Phillips’ headquarters are located in Bartlesville, Oklahoma, and additional offices are maintained in Alaska, Texas and Denver, Colorado.

Philanthropy at mines

Selection for the Scholars Program focuses on the disciplines that directly support Phillips' activities: primarily petroleum engineering, geophysics, geophysical engineering, chemical engineering and mechanical engineering. Scholarship awards range from \$500 to \$5,000 annually for resident and non-resident students. To qualify as a scholar, entering freshmen must have a minimum SAT score of 1300 or ACT of 30. Once accepted, the students must be enrolled in at least 12 credit hours and maintain a cumulative grade point average of 3.0 or higher.



The 2001-2002 Colorado School of Mines Phillips Scholars attend a luncheon sponsored by Phillips Petroleum Company.

Most students agree that the Phillips Scholars Program means they don't have to work while attending school, which allows them to spend more of their time studying. Phillips scholar since 1998 and chemical engineering major Leslie McCandless also finds time to run cross-country and track. But, she said, "the greatest value of the program has been getting to see how corporate industry works; how business, industry, and science all go together."

The students gain that perspective acutely in their sophomore and junior years, when they become eligible for summer internships. The internships afford hands-on experience in the type of work environment the students plan to enter following graduation. Bommarito knew he wanted to pursue a career in petroleum engineering, but not in what area. "The Phillips internship helped me decide," he said. "When I was given the chance to do some production engineering, it proved to be a turning point for me."

Leading them along the road to such discoveries are academic mentors from CSM and professional mentors from Phillips. Whenever possible, the Phillips mentors are also Mines alumni who work in the disciplines the scholars are pursuing. By sharing their own experiences, the mentors serve as a continuous resource and help nurture the scholars' personal and academic development. The mentors introduce the students to professional organizations, recommend curriculum choices, and provide intellectual and emotional encouragement.

The Phillips Scholars Program also develops a sense of community and social responsibility in the students. For example, the scholars volunteer as mentors themselves in local pre-college science and mathematics classes. The scholars have also cooked at a homeless shelter during Thanksgiving, worked with the Toys for Tots program during the holiday season and regularly coordinate social gatherings and networking opportunities for the scholars group.

"People find being a Phillips scholar an impressive thing. It's been really a great opportunity for me," McCandless said. "It's something I'll always be thankful for."

Phonathon and Scholarships— One Student's Experience

In addition to working part-time, many of the students you talk to from Mines' Phonathon program receive scholarships. MINES spoke with one of them about his experience as a scholarship recipient and Phonathoner. Joshua Venters, a senior geological engineering major from Black Hawk, Colorado, joined Phonathon in the fall of 2001.



*Scholarship student and Phonathoner
Joshua Venters*

M: Why did you decide to attend Mines?

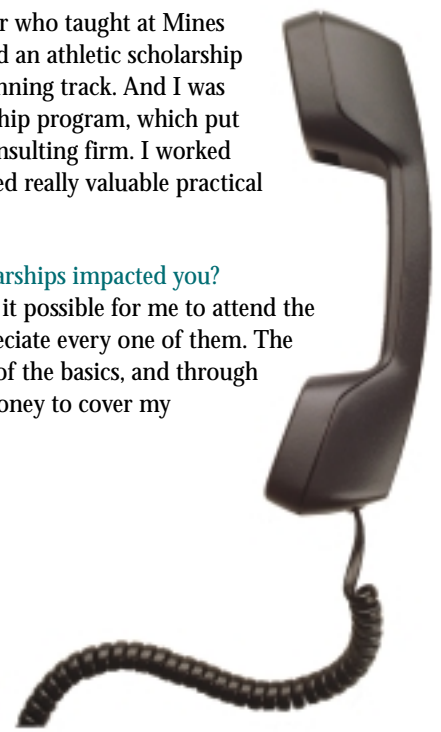
JV: Because of the high quality of the geological and mining engineering programs. I grew up in gold mining territory, so I've always been fascinated with geology. I chose to study geological engineering here because I wanted to design roads and bridges.

M: What scholarships have you received?

JV: I went to Gilpin County High School in Black Hawk, and the city awarded me the Gilpin Eagle Scholarship. Mines awarded me two medals of honor as "Mr. Math and Science Colorado." I received a scholarship from Norman Blake. He's a retired Black Hawk miner who taught at Mines for a while. I also received an athletic scholarship for four semesters for running track. And I was part of the co-op internship program, which put me to work at a small consulting firm. I worked there for a year and gained really valuable practical experience.

M: How have your scholarships impacted you?

JV: They definitely made it possible for me to attend the School, and I really appreciate every one of them. The scholarships cover most of the basics, and through co-op, I saved enough money to cover my remaining fees.



Alumni Events calendar

February

21 Two Denver mixers: 1) Wynkoop Brewing Company, 1634 18th Street, Denver. 2) Gordon Biersch Brewing Company, 1 W. Flatiron Cir., Broomfield. Both are 5-7:30 p.m., two drink tickets & hors d'oeuvres; \$5/person at door. RSVP: 303-273-3295; jtblair@mines.edu.

22 Hockey night in Anchorage, Alaska. CSM Alumni will meet to cheer Colorado College. 7:05 p.m.

23 Alumni/Athletic Dept. celebrates 25 years of women's athletics at Mines.

26 CSM Mining Department Reception/SME Annual Meeting, Hyatt Downtown Phoenix, Ballroom A, 5:30 to 7 p.m. Please RSVP to Shannon Mann, smann@mines.edu; or Bob Kendrick '54 480-575-0832.

March

17 13th Annual Bone Valley BBQ. CF Industries Ranch, Hardee County, Fla., 2-6 p.m., RSVP by March 13 to Judge Holmes '60 at 863-533-6634.

21 Three Denver mixers: 1) Wynkoop Brewing Company, 1634 18th Street, Denver. 2) Gordon Biersch Brewing Company, 1 W. Flatiron Cir., Broomfield. 3) Rock Bottom Restaurant & Brewery, 9627 East County Line Rd., Englewood. All are 5-7:30 p.m., two drink tickets & hors d'oeuvres; \$5/person. RSVP: 303-273-3295; jtblair@mines.edu.

April

12-13 Soccer alumni weekend. Friday, 7:15 p.m. at Coolbaugh House; Saturday, varisty/alumni intra-squad match, noon.

29 Houston section annual golf tournament at The Club at Falcon Point in Katy, Texas, 11 a.m. Call Dean Stoughton, 713-961-8344, for reservations and information.

May

1-4 REUNION for classes '42, '47, '52, '57, '62, '67, '72, '77, '82, '87, '92. For more information call CSMAA at 303-273-3295.

09 Lunch Bunch, an informal alumni get-together, meets at the Buffalo Rose in Golden, Colo., 11:30 a.m.

16 Grand Junction section luncheon at Bookcliff Country Club, 2730 G Road, noon. For information call John Howe at 970-242-4903 or Del Tolen at 970-256-1118.

For the most up-to-date information, check the Web site: www.alumnifriends.mines.edu/news_and_events/default.htm

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Making Your Mark at Mines

The Department of Chemistry & Geochemistry is currently filling the front of Coolbaugh Hall with personalized bricks named by donors. Some suggestions for naming bricks are parents' names, your name and graduation year, your and your spouse's names, or the name of a professor or mentor you wish to honor. Personalized bricks make a unique and lasting birthday, holiday or congratulatory gift.



The cost for a named brick is \$100. Proceeds will enhance the Department Development Fund. You can purchase your brick by visiting

www.oia.mines.edu/forms/brick_chemistry/brick.htm

or contact Carolyn Thomas by E-mail: cthomas@mines.edu; telephone: (303) 273-3610.



Metro Denver

"Mines—An Exemplary Institution" was the topic Robert Moore, CSM vice president for finance and operations, presented to the Denver Southeast section during lunch at the Breckenridge Grille in September. Of great interest were details of the 10-year agreement between Mines and the Dubai National Oil Company to develop the Petroleum Institute in Abu Dhabi.

Attendees included section leaders **Dick Mandel PE '53** and **Jack Haley PE '48**, and **John Pfuetze BSc CPR '71**, **Lou Phannenstiel PRE '54**, **John Stout MSc Geol '59** and sections manager **Bob Pearson PE '59**.



A group of Denver-area alumni took a train ride through the Royal Gorge in October.

Young Alumni

Mary Pott BSc CPR '83 and **Kimberly Lewis BSc CPR '92** organized a chili dinner to honor students who received Mines Medals in high school. The dinner, held on a Friday evening, included alumni association staff and professors as well as about 60 students. Everyone mingled and a few lucky students won door prizes that included baskets of goodies. Pott and Lewis plan to make the Mines Medal dinner an annual event.

Southwest

Arizona

The Southwest section had a successful year of socializing and propagating CSM philosophy. The Mines Olympics, held in Sun Lakes with Deloris and **Newell Orr Met E '54** as hosts in November, had a new twist in that the men were pitted against the women in various athletic contests. The "Battle of the Sexes" was won by the men in the final event (basketball free throws). The score was tied in the putting event and very close in the bocce ball. Due to the intense competition, the committee decided to forgo the dart games.

The SME meeting in December in Tucson had a well-attended luncheon in the Doubletree Resorts thanks to the efforts of a number of people including **Sam McClaren PE '54**.

Rocky Mountain



Tony Setter EM '32 (right) hosted a fabulous picnic for 38 after the CSM-Mesa State football game in Grand Junction, Colo., in October. President Trefny and his wife, Sharon, also attended. At left is **John Howe BSc Geop '83**.

West

More than a dozen alumni joined the men's basketball team for a post-game meal in Olympia, Wash., during New Year's weekend and another seven ate with the team in Bellingham, Wash. Those in Bellingham included front, **Rone Tromble**, middle from left, **Steve Isenhart BSc Geop '72**, **Chris Kaiser BSc CPR '96**, **Jessica Kaiser BSc Met '96** and back, **Sharon Isenhart** and **Derek Isenhart**.



International

Korea



The Korea section meets once a year in March and has 50 members

CSMAA contributors

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The Colorado School of Mines Alumni Association thanks the following individuals who, in addition to paying their annual membership dues, made contributions to the Alumni Association. For more than 100 years, CSMAA has operated as an autonomous independent nonprofit organization dedicated to serving the interests of Mines alumni. Contributions support the CSMAA student financial assistance fund, the endowment fund and the general operations fund.

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1949

Alvin Shames Met E is an adjunct professor at Long Island University teaching graduate courses in technical innovation and program management. He regularly conducts seminars on innovation for several companies in Israel including Israel Aircraft Industries. He also consults on new product development.

1950

Clifford A. Mark Geol E has retired.

1951

James R. Daniels Geol E is executive vice president of Murfin Drilling Co. Inc., in Wichita, Kan.

1952

James H. Bright Geol E, after studying arbitration at the Pepperdine School of Law, has been appointed a non-attorney arbitrator by the Nevada Supreme Court. He resides in Reno, Nev.

Walter J. Lochmann Met E and his wife Margaret now live in San Diego, Calif.

1953

Donald S. Quick Geol E is retired in Redding, Calif.

1959

Bartlett W. Paulding Jr. Geol E is retired in West Groton, Mass.

1960

David L. Watson EM is an independent mining consultant in Salt Lake City, Utah.

1961

George A. Holcomb EM is retired in Grand Junction, Colo.

Robert H. Marshall EM is retired in Fairbanks, Alaska.

1962

John P. Chase Met E has retired as manager of manufacturing operations for General Electric. He lives in Tucson, Ariz.

1966

Jonathan E. DuHamel Geol E, MSc Geol '68 is a private consultant and freelance writer in Tucson, Ariz.

W. Richard Moore Geol E is chief geologist for NeedleRock Exploration in Crawford, Colo.

1967

Gary E. Butts Met E is a consultant in Arvada, Colo.

1968

L. Bruce Hinton Geop E is a geoscience consultant for JB Consulting in Dallas, Texas.

Ramon S. Pizarro MSc Met is retired in Greenwood Village, Colo.

Charles N. Wentz Chem E is manager of legacy projects for U.S. Steel LLC in George West, Texas.

1969

Richard J. Carlson Met E, MSc Min Ec '81 is an assistant professor for the Metropolitan State College of Denver. He lives in Golden, Colo.

S. Clark Otterness Met E has retired from ASARCO, Inc. and lives in Draper, Utah.

David L. Wacker PE is a senior regulating consultant for Conoco Inc. in Houston, Texas.

David E. Wright Geol E is now retired.

1972

Robert C. Arnim II BSc Pet is a team leader in drilling and completion engineering for the Bayu Undan Development Project for the Phillips Petroleum Company in Western Australia.

John R. Johnstone BSc Pet is an OE/CSOC champion for ChevronTexaco in Houston, Texas.

1973

Donald G. Apt BSc Math, Msc Math '74 is commercial director of Duke Energy Field Services.

Gene M. Gehauf BSc CPR is a senior technical adviser for Mustang Engineers and Constructors in Houston, Texas.

Logan T. MacMillan BSc Geol, MSc Geol '75 is the principal for

Litmus EPO, LLC in Littleton, Colo.

1974

Charles A. Dowdell BSc Geol is supervising engineer for the Los Angeles County Sanitation Districts.

Hugh E. Harvey Jr. BSc Min, MSc Pet '80 is a manager for Intrepid Mining, LLC in Denver.

Shane Mohammadi BSc CPR, MSc CPR '75, PhD CPR '81 is a development planner for Exxon Mobil Corporation in Houston, Texas.

1975

Andrew P. Schissler BSc Min is a PhD candidate and senior lecturer in CSM's mining department.

1976

M. Stephen Enders BSc Geol is president of Phelps Dodge Exploration Company in Phoenix, Ariz.

1977

David Chazin BSc Min is a systems architect for SomaLogic in Boulder, Colo.

1978

Brandon R. Brygider BSc Geop, MSc Geop '80 is an energy management professor at New York Institute of Technology.

Allan R. Hill BSc Met is a senior manager for Lockheed Martin Astronautics' advanced development programs in Fort Worth, Texas.

Peter M. Mueller BSc Pet was appointed to the Colorado Oil and Gas Conservation Commission.

1979

Kenneth L. Dunsmore BSc CPR is IT development manager at Enron Net Works.

Paul F. Martin BSc Min is an engineer for Flender Corporation in Elgin, Ill.

Joseph P. McConnell BSc Min is a business analyst in product management for Global Healthcare Exchange in Westminster, Colo.

Bruce W. Techentien BSc BE is senior technical adviser for

Petroleum cont.

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1980

Timothy E. Lien BSc CPR is senior production engineer at Bass Enterprises Production Company.

Timothy M. Marquez BSc Pet owns Venoco Inc. in Carpinteria, Calif. He is expanding into South America and doing a lot more exploration these days.

Richard D. Peters BSc Math, BSc CPR is a production development engineer for Shell Global Solutions.

Thomas E. Stevenson BSc CPR owns Stevenson Software Services in Katy, Texas.

1981

Ronald E. Harris BSc Geop is staff geologist for Anadarko Petroleum Corporation in Houston, Texas.

James J. Kleckner BSc Pet is vice president of worldwide exploration and production for Kerr-McGee Corporation in Houston, Texas.

Marty L. Martinez BSc Met is senior process metallurgist for MACSTEEL in Fort Smith, Ark. He is married and has four children.

Daniel J. Rich BSc CPR is a retail buyer for Coliseum Books in New York City.

Michael J. Sullivan BSc Geol is an assistant division engineer in the Division of Water Resources for the State of Colorado in Alamosa, Colo. He is married to **Sandra A. (Matthews) Sullivan BSc CPR '82**.

Steven C. Wilson BSc Geol is a software consultant for Dunnington Software Development in Fort Worth, Texas. He is married with two children.

1982

Patrick C. McCall BSc CPR is a research fellow with Procter & Gamble in Cincinnati, Ohio. He is married with three children.

David N. Meendering BSc Min, MSc Met '88 is plant manager for H. C. Stark in Coldwater, Mich.

Jon G. Walker BSc Geop is a

supervisor in data services for Advanced Data Solutions in Houston, Texas.

1983

John G. Farrell BSc Geol is a software development manager for



PetroWEB in Denver.

Scott M. Oldham BSc Geop is a partner with Oldham and Oldham Co., L.P.A. in Akron, Ohio. He is also co-chair of the firm's intellectual property group. His practice focuses in patent law, intellectual property law, unfair competition law, technology licensing, and trade secrets.

1984

David W. Dorrance BSc Geol is senior vice president for Layne Christensen in Sugar Land, Texas.

Michael C. Maguire BSc Met, PhD Met '89 is vice president of KomTek in Worcester, Mass.

Jean Michel Tourre MSc Met is vice president of incineration for Teris, LLC in Dallas, Texas.

1985

Daniel G. Anderson BSc Pet is senior staff petroleum engineer at The Williams Companies Inc. in Denver.

William A. Gilbert BSc Pet, MSc Pet '90 is a partner at Cysive, Inc. in Denver.

Michael E. Kalinski BSc Geop is an assistant professor at the University of Kentucky in Lexington.

Curtis L. Lightle BSc Min is maintenance superintendent at Texas University in Tatum, Texas. He is married with three children.

1986

Cho Nai Cheung BSc CPR

works in the accident release prevention organization for the Contra Costa Health Services. She lives in Concord, Calif.

Noelle R. Cochran BSc Eng is senior engineer for Scientech, Inc. in Englewood, Colo.

S. Scott Gutberlet BSc Pet is manager of planning and evaluations for the Unocal Corporation in Anchorage, Alaska. He and **Simone E. (Southall) Gutberlet BSc Pet '84** announce the birth of their third child, Ryan, born January 2001.

Charles P. Willis BSc Pet is an operations manager for El Paso Production Company in Houston, Texas.

1988

Darryl J. Colvin MSc Met is a major and a systems coordinator for the U.S. Army at the Pentagon, in Arlington, Va.

Gregory S. Palincx BSc Geop is a regional systems engineering manager for Network Appliance in Englewood, Colo.

1989

David R. Cassiday BSc CPR is a research scientist for Perrigo in Allegan, Mich.

Gary E. Grove BSc Pet is senior pipeline engineer for Mustang Engineering, Inc. in Houston, Texas.

Vien O. Perez BSc CPR is a network administrator for US Nursing/Fastaff in Denver.

Tracy Vowel Wallace BSc CPR is manager of financial trading for Duke Energy Merchants in London, United Kingdom.

1990

Anthony R. DeVito BSc Eng is resident engineer for the Colorado Department of Transportation. He lives in Littleton.



Nick E. White BSc Geop, MSc Geop '95 married **Trish Green BSc**

n t h e m o v e

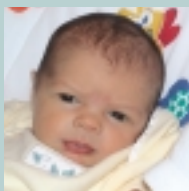
Geol '91, MSc Env Sci '94 Jan. 27, 2001 at Holy Ghost Church in Denver. Both work for Landmark Graphics Corp. She is manager of business systems and he is senior systems engineer. Pictured above at the wedding, top row from left, **Sandy Canfield BSc CPR '84, Mark Canfield BSc Geop '83, Gerardo Garcia MSc Geop '91, Tim Yearous BSc CPR '92, Gregg Nyberg BSc CPR '92, Molly McClure BSc Geol '94, Justin Hedley BSc Geop '86, MSc Geop '91, Jeff Emanuel BSc Geop '87, MSc Geop '89, James Leo, Russ Dyk BSc Geop '91, Darrell Kramer MSc Geop '84, PhD Geop '91, Dennis Hanneman BSc Eng '91, Holly Bellmund MSc Env Sc '94, Craig Artley MSc Geop '92, CSM Assoc. Prof. Eric Von Vleck. Middle row from left, **Angie Yearous BSc Eng '91, Gina Nyberg BSc CPR '92, Mary Stollenwerk Expl Geosciences '95, Kathryn Matsuda, Christina Robledo, Joe Griffin BSc Pet '89, White, Green, Mike Krause BSc Pet****

'89, Bill Sharp, Barbara Boucé. Also present but not pictured, Richard Green Sr., CSM guest professor, and Arthur Kidnay, CSM professor.

William W. Leslie PhD Geop is a geophysicist at Petrotel.

Christopher W. Ramsay PhD Met is assistant director of University of Missouri-Rolla's freshman engineering program. Ramsay is the recipient of the Foundry Educational Foundation's development award for 2001. He is also UMR's Iron and Steel Society Professor of metallurgical engineering.

1991



Dave Stowe BSc CPR and Melissa Stowe BSc Geop '93 announce the birth of Benjamin

Hastings Stowe, born Oct. 8, weighing in at 6 pounds, 10 ounces and measuring 19 inches long.

1992

Arlie C. Huffman III MSc Geop is a teacher for the Jefferson County [Colorado] School District.

Kimberly M. Lewis BSc CPR is working in alumni relations for CSMAA. She lives in Golden, Colo.

Peter A. McKenzie BSc Min is a graduate student at CSM.

1994

Gary R. Abbott BSc Eng is senior engineer for Key Production Company Inc. in Lakewood, Colo.

William D. Braden BSc Pet is an engineer with Energy Operating Company Inc. in Lakewood, Colo.

Stephanie D. Hughes BSc Eng is an engineer for Flat Iron Structures Company in Longmont, Colo.

Gregory L. Trousov BSc Math is president of TruSoft International Inc. in St. Petersburg, Fla.

2000-2001 CSMAA Financial Statement

A balanced-budget financial report was presented to the CSMAA Board of Directors at its October meeting. The financial audit was done by Kundinger & Associates, PC.

Total Revenue	\$445,761
Total Expenses	537,217*
Assets:	
Investments	547,138
Cash Accounts	147,160
Student Loans Outstanding	173,078
Other	13,731
Total Assets:	881,107
Liabilities and Net Assets:	
Liabilities	44,474
Net Assets	
General Unrestricted	206,671
Temporarily Restricted	411,838
Permanently Restricted	218,124
Total Net Assets:	836,633
Total Liabilities and Net Assets:	\$881,107

*Includes a paper loss of \$115,075 in investments.

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SHARE YOUR EXPERIENCES!!

Mona Moyer, wife of a former Mines student **William E. Moyer BSc Phy '85**, wants your college-years stories for a book she is writing about life's funny moments as experienced by spouses of Mines students. Moyer would like to keep the book's focus on CSM experiences, particularly from the engineering perspective. She is looking primarily for funny stories, but interesting or poignant experiences during your Mines years are also welcome. She needs the following college years information: spouse's major and year of graduation; graduate or undergraduate; where you lived; children; your job(s); anything else of interest. She would like the information by June 1st. Moyer can be reached at:

14012 NE 47th Ave.
Vancouver, WA 98686-1691
wmoyer@ieee.org

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Petroleum Engineering Head Craig Van Kirk and Intisar Al-Abri, the first Omani woman to work for Occidental Oil Company as an engineer, were all smiles following December's commencement ceremonies. Al-Abri graduated with degrees in petroleum engineering and economics and business.

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