

Winter 2000
Vol. 90 No. 1

MINES MAGAZINE

Colorado School of Mines Alumni Association

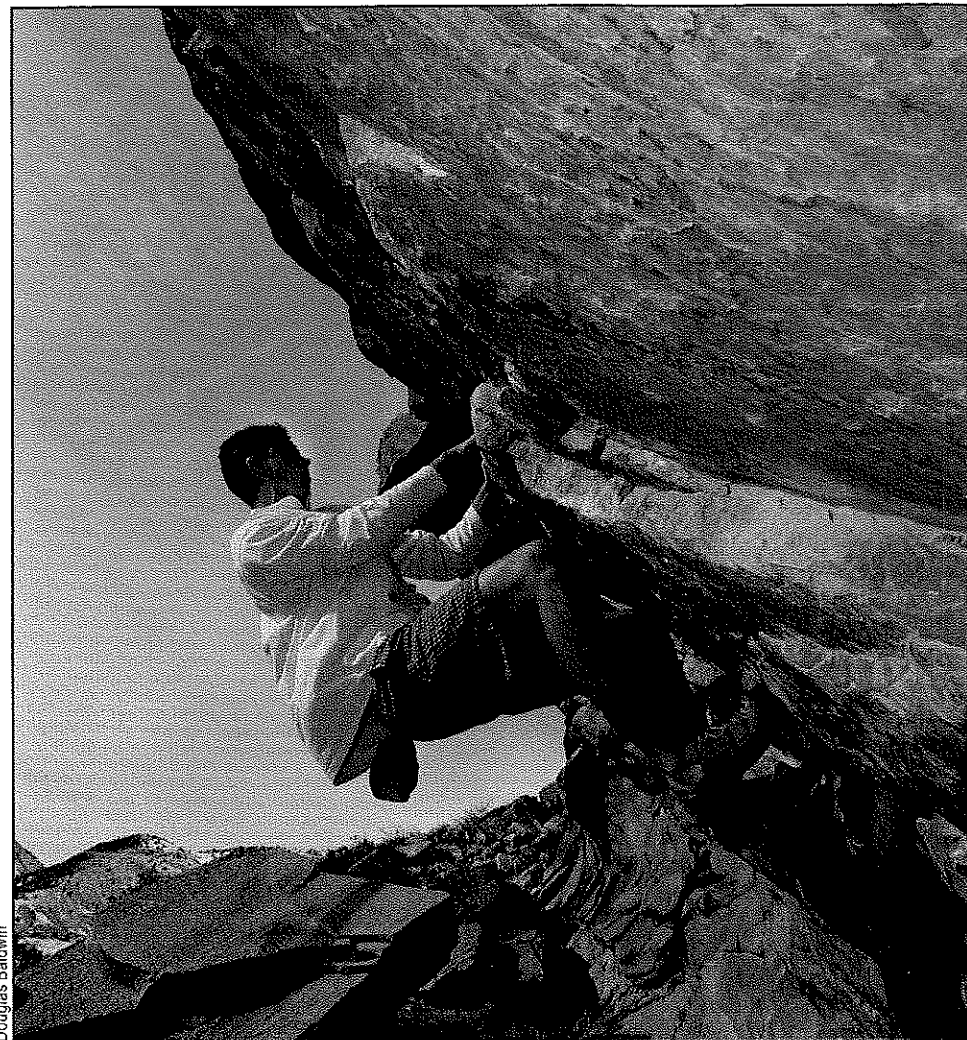
Spelunking in Lechuguilla Cave

Overcoming claustrophobia and fear of the dark,
a Mines alumnus goes underground.

In Their Own Words: Mines men
remember the Korean War.

Don't miss the alumni survey
on page 41.





Douglas Baldwin

Marco Leon studies hard, but also makes time for rock climbing.

Junior Marco Leon Presents Research at National Energy Symposium

Despite being the son of artists, Marco Leon of Santa Fe, N. M., decided early in life that he wanted to pursue engineering. "I've always been interested in figuring out how things work," he says.

Leon is a junior in mechanical engineering and last summer he interned at Los Alamos National Laboratory developing a portable tomographic gamma scanner. "Tomographic gamma scanners are advanced gamma ray, non-destructive assay instruments capable of assaying radioisotopes and special nuclear material in a variety of containers," he explains. "They can give an inside view of a container and locate radioactive hot spots without actually opening up the container. But most importantly, in about an hour, they provide a very accurate number for the amount of fissile material inside a container. The project I worked on dealt with refurbishing the prototype [designed at the lab in 1993]. It was converted into a certified, portable field instrument for nuclear safeguards and waste measurements." Leon presented results of his summer internship at the Department of Energy Student Research Symposium in Livermore, Calif.

This spring, Leon will attend school in Switzerland and will

study ski-lift design and auto and airplane design, "fun stuff," he calls it. He already is fluent in Swiss German and has Swiss grandparents in Zurich. Before he leaves for Switzerland, he will again work at Los Alamos. "I'll be doing fuel-cell research," he says, "trying to develop an electric car that runs off of fuel cells."

While Leon is a 4.0 honors student ranked No. 1 in his sophomore class, he still has time for extra-curricular activities. He was features editor for the *Oredigger* fall semester, a peer mentor, a fourth-grade tutor, a volunteer for St. Johns College [Santa Fe, N. M.] search and rescue team from 1996-1999, and organizer of the 1999-2000 CSM college preparatory program weekend for high school students. Leon is a member of Tau Beta Pi National Engineering Honor Society, Society of Professional Hispanic Engineers, American Society of Mechanical Engineers, Blue Key and Earthworks. He recently was named an Achievement Rewards for College Scientists Virginia Ramo Scholar for 1999-2000. In addition, Leon is an athlete who enjoys skiing and rock climbing. He has climbed 12 of Colorado's 52 "14ers" so far. ■

Colorado School of Mines Alumni Association

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Winter 2000
Vol. 90, No. 1

MINES MAGAZINE

Colorado School of Mines Alumni Association
The Voice of Mines Alumni Since 1910

FEATURES

- 9 **Crow Native American Earns Geology Ph.D.**
Full-blooded Crow Russell Stands-Over-Bull is the first of his tribe to earn a Ph. D. in the hard sciences, receiving his degree in December. He overcame skepticism and distrust to succeed.
- 12 **Colorado School of Mines in the 21st Century**
Expert predictions indicate biotechnology will be the next revolution. NSF director calls it "biocomplexity," referring to the integration of research in the life, physical and social sciences with advanced technology.
- 15 **In Their Own Words: Mines Men in Korea, Part I**
More than 380 CSM graduates and students served in the U. S. military during the Korean War, from 1950-1953. Many recorded their experiences in journals and letters.
- 24 **Spelunking in Lechuguilla Cave**
Paul Burger '91 began caving as a boy and now spends a great deal of time underground. As staff hydrologist at Carlsbad Caverns National Park, he maps and explores Lechuguilla Cave.
- 26 **Preserving the Past**
Margaret Katz's background of art, history and mining made her the perfect choice to oversee the restoration and preservation of CSM's valuable books, maps and documents collections.
- 41 **Section Activities Interest Survey**
Let us know what sort of activities you would like to participate in with fellow alumni.
- 43 **Thank You To 1998-98 CSMAA Donors**
Alumni donations keep the association going and the CSMAA would like to thank all those who contributed this year.
- 46 **From the Archive**
The History and Significance of Agricola's *De Re Metallica*: Why does the president of the faculty senate carry a book written in 1556 to every commencement ceremony?

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On the cover: Lechuguilla Cave is one of the most spectacular discoveries of the century. Though it's not open to the public, Paul Burger BSc Geol '91, found a job that allows him to explore there. Photograph by David Harris/HPS.

The Chicken or the Egg?

DICK BEACH, 1999 PRESIDENT OF THE CSM ALUMNI ASSOCIATION

So which came first anyway? Who cares? Alumni bask in the fine reputation of the school, a reputation that is in large part—a reflection of the accomplishments and generosity of its alumni. Think about it . . .

NEW MINES MAGAZINE

Maureen Keller, editor of *Mines Magazine*, has been hard at work adding new features and improving the magazine. I hope you like the changes. As I noted earlier, we are discussing ways to merge the magazine with *Mines Today* so that we'll have one magazine that truly speaks to and for Mines alumni and friends.

Among other things, we are going to a quarterly format that will have more pages, more color and more features.

STUDENT RECRUITMENT

Mary Pott BSc CPR '83 has succeeded in recruiting more than 360 alumni volunteers for the Alumni Admissions Representative program. These volunteers from throughout the country will be asked to represent CSM at high school college fairs, contact prospective students in their areas, host send-off parties for entering freshman and, in Colorado, present Mines Medals to outstanding high school seniors in math and science. (See article on page 40.)

UPDATED WEBSITE

Don't forget to check the enhanced alumni web page at csm.aa.mines.edu/alumni for the most up-to-date calendar of section activities, including reunions. Use the site to update biographical

data, join the association, or buy Mines merchandise. Active members can also use the CSMAA on-line directory, which lists all Mines alumni.

This is my last column. Thanks to everyone who has helped the association during my term. Vicki Cowart MSc Geop '77 is our president for 2000. Joining her are Ed Crabtree EM '60, president-elect; Bill Zisch BSc Min '79, treasurer; and Kathy Altman BSc Met '80 as secretary. Altman, elected in February, is senior metallurgical engineer at SNC-Lavalin America, Inc.

When I began my term as president, I set a goal that CSMAA would work together with the rest of the Mines family to serve and support the school, its students and alumni. Nearly a year later, much has happened and I think we've built a stronger relationship with Mines.

. . . Working together we help each other to be all that each can be (with apologies to the U. S. Army). It's not the chicken or the egg. It's the chicken AND the egg! ■

RONALD F. WEISZMANN, LL.M., P.C.

Master of Laws in Taxation, 1999
University of San Diego School of Law
Juris Doctor of Law, 1967
University of Denver School of Law
Professional Degree, Petroleum Refining Engineer, 1964
Colorado School of Mines



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Kyle Scooby, a recent civil engineer graduate from an unmentionable school does a "daffy" 40' in the air. If you look closely, you will see Taxlawyer1@aol.com on the back of his helmet. We are not sure if he is happy because he just graduated or because he is sponsored by Taxlawyer1@aol.com. Although we cannot promise you will do a "daffy", we are confident you will feel like doing one when we work with you in planning and helping you to minimize your Federal Income, Estate and Gift taxes.

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**Look for the next
Mines Magazine
in May.**

IN THE NEXT ISSUE:

*The History and Mystery of
Herbert Kim '28.*

Herbert Kim was a Chinese Korean who fled to China as a refugee, graduated from Mines, worked for the Soviets and was then jailed by them, returned to China and Korea, and in the end, disappeared.



**Alumnus' Norway Adventure
Reminds Reader of Her Own**

During World War II, Norway was occupied by Germany (as you know). With Norwegian labor and German know-how, a magnesium plant was built in Porsgrun. On the Saturday before the Monday it was ready to begin operating, the American Air Force flew from England and bombed it so it could not operate.

This, of course, changed German production of incendiary bombs and made a difference in the war's end.

In 1951 Frank E. Love EM '36 was appointed director for rebuilding the plant. He had spent his war years supervising at a plant in Henderson, Nev., Basic Magnesium Inc.

Frank and two other men from BMI went to Norway and with Norsk workers, rebuilt the plant. After a year and a half, it was operating. I believe it is now a very productive industry.

The Americans were well cared for including two families. The Love family enjoyed this great experience—our children attended school; we lived in Skein one year in Hoyers Hotel (really got spoiled) and Porsgrun for six months in the home of a school superintendent, Tor Linge.

The people were so friendly and hospitable. We were lucky too to attend the winter Olympics. So, I hope Michael Kalinski's ["Headliners," Sept. - Oct. 1999] time there is as enjoyable as ours was.

Frank E. Love died Sept. 9, 1987. I am now married to Harold L. Kelley EM '36, Met E '38

Marion E. Kelley

What To Call Ourselves?

Over a large area, the Colorado School of Mines is well known by simply "Mines." "CSM" is also used, but some of us do not favor it. It mixes the School with CSU, CU and other letters of no real distinction. I think that we can take time out and use "Colorado School of Mines" and just "Mines." There ought to be enough computer

memory now so that we can stop using two letters for the states. Want to bet on how many students cannot spell all of the states correctly?

Roland B. Fischer Met E '42

**Graduate Recalls
His Long Trip to CSM**

It was a great pleasure and interest to read the article on "Remembering Mines" by Abelardo Trevino in the September/October 1999 issue of *Mines Magazine*. I was a student of CSM during 1950-51 and would like to share some memories with you.

I graduated in metallurgical engineering from Bengal Engineering College near Calcutta, India in 1945. Two of my classmates had studied at CSM and had returned to India after completing graduate studies. I applied to CSM and received a letter from William Burger, director of admissions, confirming my registration. On production of the admission letter, U. S. Consul at Calcutta granted a student visa. I still remember that he advised me to introduce myself as an "East Indian" instead of just Indian to differentiate from the American Indian.

My journey to America began Dec. 26, 1949. After reaching Bombay in two days, I boarded a ship, the SS *Jal Jwahar* (named after India's first prime minister) for journey to Liverpool, England. The journey was rough sometimes making me sick and we passed through Suez Canal and several seas. We reached Liverpool Jan. 18, 1950, then proceeded to London.

After two days in London, I boarded the famous HMS *Queen Mary* in Southampton. I was excited and thrilled to ride the luxury liner. We reached New York in five days. After two days at the YMCA in New York, I started the journey to Golden.

Thomas Cook in Calcutta had arranged my itinerary. I took a night train to Chicago, arriving the next morning. That evening I boarded a train to Denver. In Denver I boarded a small train to Golden and arrived about noon Jan 30.

My friend Roy, who was already studying at CSM, had arranged for my board and lodge at Mrs. Bell's place. Mrs. Bell, her daughter and son-in-law managed a boarding house for foreign students. The spring semester had already started so I ate a quick lunch and I went to the metallurgy department for enrollment and course program. Prof. Carpenter, the head of the department, interviewed me and designed a program of studies. My career at Mines had begun.

Satya Sarkar MSc Met '51

**Athletics Department
Needs To Shape Up**

With the events that have occurred within the athletics department since I graduated, I hope the morale improves. I was a member of the track team throughout my career at Mines and I hate to see great coaches and athletes leave the program and the school. It seems as though the politics within the

continued on next page



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Letters cont.

continued from preceding page
organization are interfering and diminishing the reputation of the school. It breaks my heart to see the academic and athletic administrations allow "bad" business for the sake of politics or saving face. And, with respect to the events that have occurred within the athletics department, I have neglected to give to the Annual Fund until the athletics administration is either removed or put in its place. I won't stand letting great coaches go (or jerking them around) and allowing the disrespectful coaches off easy. It's bad business! Even for a school.

Misty Lynn Pyatt BSc CPR '97

Alumnus' Father Is Also An Accomplished Alumnus

Regarding your November/December issue "In Memoriam" concerning Douglas Scheeling Ball [PE '43], a friend of his father, the late Maxwell Waite Ball [EM '06, Medalist '47] relayed your article to me. I had tried to contact Douglas concerning his father's files but was unable to locate him.

Maxwell Waite Ball (1885-1954) was one of your most illustrious alumni. His gas storage studies were minor. His main achievement was ABASAND, which he incorporated in 1930 to explore and develop the Athabasca tar sands of north-eastern Alberta, now producing hundreds of thousands of barrels of crude equivalent a day. With his engineering skills, he was the first to contract and operate a refinery that ran continuously from 1936 to 1941, at which time fire destroyed the plant. Ball then returned to Washington, D. C. to help the U. S. World War II war effort.

Aubrey Kerr ■

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Letters may be edited for space and clarity.

LEGISLATIVE UPDATE

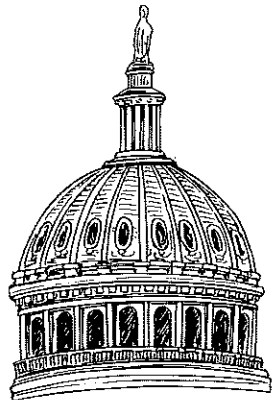
The Colorado Commission on Higher Education (CCHE) has issued a report to the Colorado General Assembly on how well each institute of higher learning in the state has done in implementing the Higher Education Quality Assurance Act. The act, passed in 1996, outlines the General Assembly's expectations for a quality indicator system to judge the state's higher education system.

The CCHE and governing boards set nine indicators and evaluated colleges and universities against a benchmark for each indicator. A portion of how funds will be distributed throughout the state may be based on how well each school measures up. The goal of the quality indicator system is to achieve high quality, efficient and expeditious undergraduate education. One key finding of the 1999 report was that funding for graduate and undergraduate programs should be separated.

Indicators used to measure CSM were graduation rates (how many years it takes) and credits for degrees (how many extra credits do students take), faculty instructional productivity (per-

centage of a 40-hour week that full-time faculty devote to teaching-related activities), freshman persistence (retention of students beyond freshman year), achievement rates (based on national test scores), lower-division class size, approved and implemented diversity plan, institutional support costs, employment of recent graduates in their fields and starting salaries of recent grads.

CSM fares well in all categories except graduation rates where the graduation rate for Mines is comparable against the graduation rate for 269 comprehensive universities and colleges—one third of which are private institutions. As a whole, all Colorado institutions lag behind these national benchmarks. Only 25 percent of CSM students earn a degree in four years compared with 36.7 percent nationally. ■



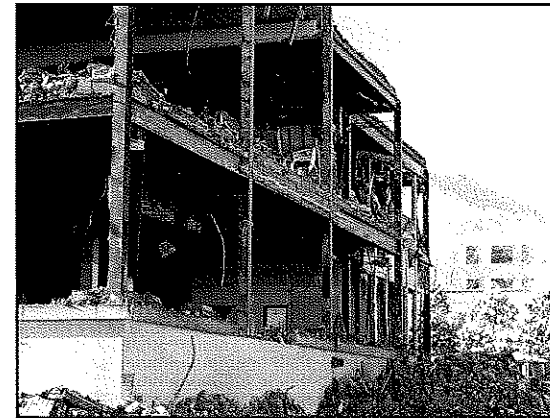
Old Courthouse Makes Way for New Classrooms

CSM began demolition of the old Jefferson County Courthouse Nov. 22 to make way for the new Center for Technology and Learning Media building. Construction is scheduled to begin in the spring with completion by summer 2001.

The state-of-the-art center will focus on education and presentation of technology. It will cover more than 35,000 square feet and contain six classroom laboratories and six team working areas for students. Total cost for the project is approximately \$13 million.

The top floor will use natural light for daytime classes.

The building's exterior will feature sandstone and brick, and the south side of the building will have extensive windows. A pre-aged copper roof will highlight the large classroom/auditorium.



Five Students Honored

Five CSM students were among 21 young scientists to receive scholarships in November for being at the top of their majors. They are Lee Becker, Michael Erskine, Brian F. David, Bradley Doyle and Marco Leon (see inside front cover for more on Leon). The awards were sponsored by the Rocky Mountain chapter of Achievement Rewards for College Scientists.

New and Upgraded Student Housing in Works

CSM is expanding the Mines Park student housing with the addition of two buildings at 1911 and 1913 19th Street. The new buildings will house an estimated 32 individuals in 16 new units and will add 30 parking spaces. The new units are located in the family housing section of the Mines complex. The \$1.3 million project is scheduled for completion by fall 2000.

In addition, the Weaver Tower improvements are nearly complete and include new carpets and lounge furniture in the common areas of 27 suites; replacement of 130 desk chairs; installations of new curtains in all the windows; and new carpeting in the west atrium.

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FOR MORE INFORMATION,
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LINDA M. LANDRUM AT (303) 273-3142

Row, Row, Row Your Boat

More than 250 college civil engineering students will be rowing in the Rockies at the annual National Concrete Canoe Competition in June. CSM was selected to host the 13th annual competition, which is organized by the American Society of Civil Engineers (ASCE) and sponsored by Master Builders, Inc.

Held in a different location each year, the national competition challenges co-ed teams of college engineering students to find a way to do the seemingly impossible: design, build and race concrete canoes.

The goal of the competition is to give students hands-on experience with engineering principles and important problem-solving and project-management skills, which they will need in their future engineering careers.

The national finalists will be determined at 20 regional competitions held in the spring, in which nearly 200 teams will compete. At the national level, the top teams compete for \$9,000 in scholarship prizes awarded by Master Builders, Inc.

Entries will be judged on several criteria. Seventy percent of the score will be based on the appearance and structural integrity of the final canoe, a display, and written and oral presentations detailing the canoes' design, construction and materials. The canoes also must pass a critical "swamp test" in which submerged canoes "pop up" and float.

The rest of the score depends on the students' paddling prowess in two-person men and women's sprint and distance races and a four-person co-ed sprint race to be held at Big Soda Lake in Bear Creek Park in Lakewood.

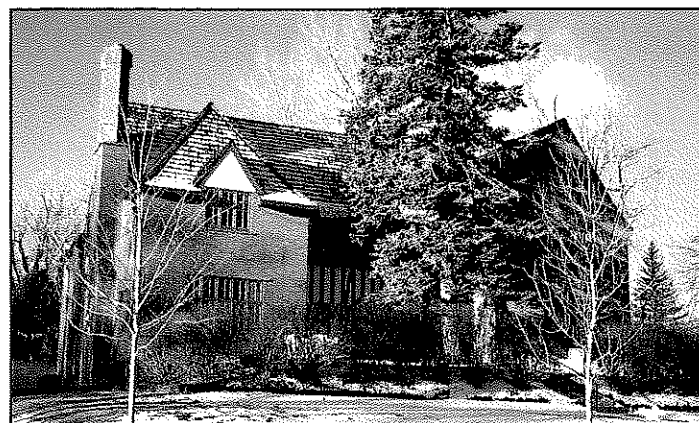
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President's Home On Display

The CSM president's house, currently occupied by the Bickarts, was featured over the holidays as one of 12 historic buildings on the 19th annual "Christmas Tour of Historic Homes." The Jacobean/Elizabethan-style home, built in 1928, is characterized by a shingled roof with flared gables, casement windows, timbering and a crenellated stair tower. The 5,000-square-foot residence was originally built for Sigma Nu fraternity for \$30,000. During World War II, the mortgage went unpaid as many of its members left to fight. In the 1940s, CSM purchased the home.

Food for the Holidays

More than 30 boxes of food were donated by the CSM community for Thanksgiving holiday gift baskets that were distributed to 17 CSM families, with the extra given to the Christian Action Guild. Volunteers for the successful effort included Debbie Barbee, Plant Facilities; Jane Cowden, Financial Aid; Fellowship of Christian Athletes; Carolyn Giarratano, Financial Aid; Jim Hein, Plant Facilities; Michelle Kozel, McBride Honors Program; Arleen Long, Aramark; Pi Beta Phi sorority; and Mike Ray, Plant Facilities.

CSM Grads Earn Top Dollar

Starting salaries for engineering graduates at Colorado School of Mines are running several thousand dollars above the current national average.

According to the annual salary survey released recently by The Engineering Workforce Commission of the American Association of Engineering Societies (AAES), the mean income in 1999 averaged \$41,473 for entry-level engineers.

The average starting salary for all graduates at Colorado School of Mines for the 1998-98 academic year was \$43,061. Certain disciplines fetched even higher figures, such as petroleum engineering graduates who averaged \$48,040; chemical engineers, \$46,028; and electrical engineers, \$45,060.

Science majors also fare well. The average starting salary for physics graduates is \$46,800, and for geophysics it's \$45,817.

Signing bonuses are becoming more common, according to CSM's career center director Ron Brummett, with some students even receiving signing bonuses just for summer work.

More than 150 companies and government agencies recruited on campus during the 1998-99 academic year. Of these, 45 were either new to CSM or returning to recruit at CSM after an extended absence.

"As technology continues to be a major factor of our nation's economic growth, engineers will remain in high demand," said Tom Price, executive director of the AAES. "Rising salaries and a very low unemployment rate reflect this demand. It's a great time to be an engineer!"

Leah McNeill
Director, Public Affairs

Hennebach Gift Benefits Professorship

Ralph Hennebach Met E '41, Medalist '65, Hon D Engr '90 has given \$145,000 to the Division of Liberal Arts and International Studies. The gift is designated for the Hennebach Visiting Professorship, established in 1991 by Hennebach.

Attention CPR/PRE Alumni

Chemical Engineering and Petroleum Refining Department Alumni

(CPR/PRE degree, 1947 - 1999)

Dear CEPR/PRE Alum:

As a part of the new accreditation procedures mandated by the Accreditation Board for Engineering and Technology (ABET), the Chemical Engineering and Petroleum Refining Department is required to design and implement an assessment program that measures and improves the effectiveness of our undergraduate chemical engineering curriculum. Details about our assessment program can be found at http://www.mines.edu/fs_home/r/miller/assess.htm. An important feature of these new procedures is a survey of alumni in order to assess the value of a Mines education in professional practice.

One instrument that we will use to help with this measurement is a survey; the first of which is presented on this page. For the following knowledge and skills attributes, please fill in the blank with a numerical score ranging from 1 to 5 where 1 is "poor" and 5 is "excellent" and return this page to the department no later than **March 31, 2000**. Thank you in advance for your help and cooperation in this important exercise!

Robert M. Baldwin
Professor and Head of Department

QUESTION Please score from 1 to 5 where 1 is poor and 5 is excellent	At time of graduation	Now
1. Basic science and math knowledge Math, chemistry, physics		
2. Basic engineering knowledge Non-chemical engineering courses		
3. Chemical engineering discipline-specific knowledge Knowledge and ability in chemical engineering courses		
4. Computer skills Programming, use of software packages, etc.		
5. Data analysis Design of experiments, analysis and interpretation of data		
6. Problem solving skills Ability to formulate solutions to open-ended problems		
7. Creative thinking Ability to formulate creative solutions to new problems		
8. Written communication skills Ability to write effectively		
9. Oral communication skills Ability to make oral presentations		
10. Teamwork skills Ability to work as an effective team member		
11. Engineering design Ability to design a chemical engineering process		
12. Impact of engineering solutions in a global and societal context Recognition of geopolitical aspects and issues		
13. Understanding of professional and ethical responsibilities Recognition of importance of professional ethics		
14. Understanding of contemporary issues Recognition of importance of socioeconomic aspects and issues		

Year of Graduation: _____ Name (optional): _____

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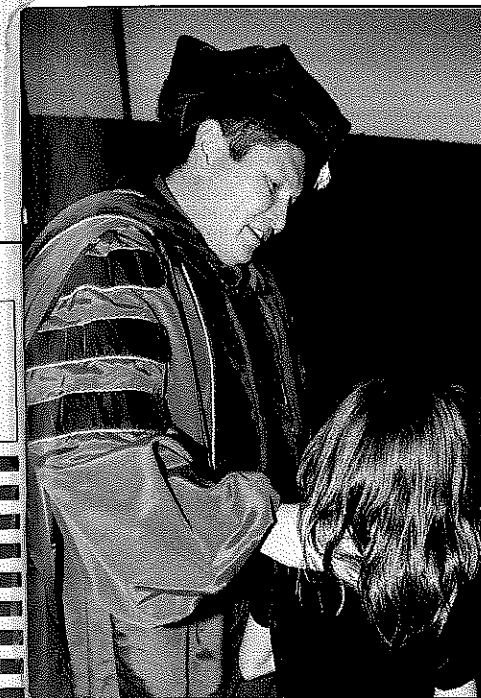
Food

More were dis the Chr includec cial Aid: Financia McBride sorority;



Crow Indian Earns Path-Breaking Ph.D.

Two worlds have tugged at Russell Stands-Over-Bull's heart for as long as he can remember. One was the Crow Indian Reservation in Montana where he grew up and where social ties can trump career aspirations. On the reservation, the tribe,



Russell Stands-Over-Bull and his daughter at December graduation.

not the individual, comes first.

The other world was the one his mother and father showed him whenever they left the reservation and drove to Bozeman, home of Montana State University. "My mom would say, 'Someday, you're going to finish there,'" Stands-Over-Bull says. "I've always had that dream. My folks ingrained it in me as a young kid." At December graduation, Stands-

Over-Bull became the first Crow Indian to earn a doctorate in hard science—a Ph. D. in geology.

"When I decided to leave the reservation and come to mines, some of my peers looked at that move as a betrayal of my tribal identity," says the geology scholar, who often shortens his name to Stands. "There has been a price. Some of my peers confronted me and said, 'You're no longer part of the tribe.'"

But Stands, who speaks fluent Crow, says he is honoring his heritage, not abandoning it. "This was an opportunity to be a pathmaker, a pioneer," Stands says. "That's pretty rare these days."

There was another motivation: The people who looked at his background and told him it couldn't be done. "I just said, 'Well, let's prove them wrong,'" Stands says.

Stands was valedictorian of Plenty Coups High School in Pryor, Mont., but he ended up back at the Crow Reservation nevertheless, moving from odd job to odd job, getting nowhere. The statistical prospects for American Indian males frightened him: short life span, high rate of alcoholism and

drug abuse, failed marriages. "I didn't want to be a statistic," he says.

After graduation, Stands was planning to make another move—to Scotland, where he'll work for BP Amoco doing oil and gas exploration in the North Sea. But that move overseas will be nothing compared to the culture shock of moving off the Crow reservation for the first time, he says. "Whether I'm in Denver or Asia or mainstream America or Scotland; it's still very different" than the life he knew as a child.

Whether it was figuring out a salad fork, seeing a ballet or trying to understand what makes mainstream Americans tick, it was a struggle. "No one speaks Crow other than the tribal peers," Stands says. "No one understands why Crows do the things we do. Our social drives are totally different."

There were days at Montana State, from which Stands earned a bachelor's degree, and at Mines when the pressures tempted him to say, "The heck with it" and go back to Crow land. "But to me, the battle is to give hope and incentive to the generations to follow," he says. "If no one had done it, no one has proven we can do it. Once I can do it, everyone else on the Indian side has the same potential."

If he had to do it again, he'd choose Mines again. "The teachers are excellent, world-class. Mines graduates are in high demand."

Stands' grandmother was the first Crow teacher to graduate from college, he says. His mother, Sharon, is principal at Plenty Coups High School. His father is a former tribal chairman. Stands' name is shortened from his great-great-grandfather's name, which translated means Stands Over a Bull Buffalo After a Fresh Kill.

Stands plans to spend a lot of time back at the Crow reservation encouraging youngsters to follow his lead. "You probably can count on one hand the full-blooded natives in the corporate oil industry," Stands says. "My ultimate goal is to prove not only to myself, but to the native community that an Indian can not only enter the corporate environment but be successful in that environment."

Stands has been working with BP Amoco in Houston while finishing his doctorate. Each evening, he speaks Crow to his wife, son and daughter. Each morning, he's back at Amoco, speaking an American business dialect of the English language. "Corporate America is really pushing the integrated teamwork, which aligns exactly with the tribal philosophy," he says. "Do what's good for the whole, downplay the individual achievement. It fits perfectly for me."

Once you've proven you're capable and can work with a team, the new corporate environment can be as comfortable as a basketball team, he continues. "You just go after it. It doesn't matter what color the fifth man is."

—Bill Scanlon
Rocky Mountain News

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CSMAA Hosts Senior Pizza Party...



Three seniors enjoy pizza and beer at the senior pizza party held in the food court of the student center. Alumni Association staff served up free food and drinks before a bus arrived to take members of the graduating class to the casinos for a night of fun. The party was held the Thursday before exams.

...And Senior Banquet



CSM granted 153 bachelor degrees, 115 master's, 32 PhDs and five professional degrees at the 125th mid-year convocation in December. One third of the PhD candidates were women, the highest percentage ever to graduate from CSM. The Alumni Association sponsored the banquet for graduating seniors and their families.

New Head Football Coach Named

Harvard University's former offensive coordinator and offensive line coach is the new CSM varsity football coach. Bob Stitt replaces Versie Wallace, who was head coach from 1995-1999.

In only one season at Harvard, Stitt set new school standards for total offense in a single game (640 yards), passing yards in a single game (405), first downs in a single game (34) and points scored in an Ivy League game (63).

"I'm looking forward to coming to the Colorado School of Mines," Stitt said before his arrival. "I'm excited at the opportunity to turn the program around and to create a disciplined team all year round, not just from August to November. Building confidence in the players and ensuring that they are taking care of themselves year round, in all respects, will be a focus."

Stitt earned a bachelor's degree in physical education and business administration from Doane College in Crete, Neb., in 1986. During his collegiate athletic career at Doane, he competed in football, baseball and track and field. Stitt then earned a master's degree in physical education from University of Northern Colorado in 1989. While there, he was graduate assistant running backs coach for two seasons.

Stitt's coaching experience also includes being assistant head coach/offensive coordinator/special teams coordinator for five seasons at Austin College in Sherman, Texas.

One hundred twenty people applied for the coaching position including assistants from the NCAA Division I level, head coaches in the National Association of Intercollegiate Athletics and others with head coaching assignments in NCAA Division II. "We had a high caliber of candidates," says Dan Lewis, CSM associate athletic director. "I was extremely impressed with many of the candidates. I also was pleased at the type of interest that happened because of the search. It was a tough decision to get down to the four we brought in."

Since Stitt's arrival in January, he has recruited six football players for next year. "I am very happy with the quality of the recruiting class so far," he says. "Each of these players has potential to play early in their collegiate careers. These recruits are a huge key to rebuilding the Colorado Mines football program."

Art Class Added to Curriculum

CSM students will have the chance to express themselves artistically in a new course being taught next semester by Bob MacPherson, director of Environmental Health and Safety. MacPherson will teach a studio art class, oil painting for beginning and intermediate students at the Foothills Art Center. He has 27 years of painting experience, has studied with prominent professionals and his paintings have been selected for juried national art exhibitions.

Campus Has Two New Institutes

Two new institutes have been established at CSM. The mission of the Colorado Institute for Macromolecular Science and Engineering and the Center for Engineering Education is to enhance the education, training and research capabilities of in the science and engineering of polymeric materials and other complex fluids. Complex fluids possess structural complexity including polymers, colloids, liquid crystals and biological fluids. Center activities encompass a wide range of research activities including the synthesis of new and novel materials, optimization of processing strategies for polymer materials, development of biocompatible materials, and the formation of nanomaterials and nanostructures from colloidal materials. Experiment and theory are integrated to advance understanding in a fundamental manner.

The Center for Engineering Education serves as a focal point for educational research conducted by faculty at CSM. The principles of cognitive psychology and educational psychology are used to explain how this system of learning works. The center marries educational research with assessment, outreach and teaching. Dr. Ruth Streveler is director of the center and Dr. Barbara Moskal is associate director.

Faculty Update

Fred Fraikor, director of the Colorado Advanced Materials Institute, was a member of a panel discussing "The Impact of Technology on Colorado: Past, Present, Future" at the Business Economic Outlook Forum 2000 in Denver in December.

CSM Emeritus Professor Robert Weimer, the 1999 Faculty Senate Distinguished Lecturer, presented "125 Years of Earth Science Programs at CSM: Lessons for the Future," at the Green Center in December.

Norman Bleistein, professor emeritus and research professor of geophysics, received the Humboldt Research Award for Senior U. S. Scientists. Bleistein will conduct research at the University of Karlsruhe in Germany for one year. The Humboldt Award is granted to a foreign researcher in recognition of past research and teaching achievements. To receive this award a candidate must be nominated by a distinguished German researcher.

The Institute for Global Resources Policy and Management will play a highly visible role at the World Mine Ministers meeting in Toronto in March. More than 50 ministers of mines from around the world are expected to attend this World Bank organized event. Jim Otto, Division of Economics and Business, will head a session on minerals investment competitiveness and John Cordes, Division of Economics and Business, will head a session on public sensitivity to mining. Otto, as associate director of the Institute for Global Resources Policy and

Management, was also invited by the Colorado Bar Association to present a talk on "Global Trends in International Mining Law" to its international practice section.

Arthur Sacks, division director of Liberal Arts and International Studies, gave a keynote address, "Education for Sustainable Development: The Humanities, Technological Education and the Transformation of Self" at the International Workshop on Education for Sustainable Development in New Delhi, India, in December. Sacks also participated in a European Union-sponsored workshop to explore the restoration of Agra, India, home of the Taj Mahal.

"Recent Microgravity Results in the Synthesis of Porous Materials," written by John Moore, department head of Metallurgical and Materials Engineering; Frank Schowengerdt, director of the Center for Commercial Applications of Combustion in Space; and Ph. D. student Xiaolan Zhang won the outstanding paper award at the Space Technology and Applications International Forum 1999.

John Warne, professor of geology and geological engineering, completed his second three-year appointment to the advisory board of the Petroleum Research Fund administered by the American Chemical Society in Washington D. C. Warne served on the board from 1993 to 1999 and was chair of the committee that reviews and recommends research awards in geological sciences.

Barbara Bath, associate professor of mathematical and computer sciences, has received the Burton W. Jones Award for Distinguished College or University Teaching of Mathematics from the Rocky Mountain Section of the Mathematical Association of America.

Don MacAlady, professor of chemistry and geochemistry, gave an invited lecture Jan. 11 at the north-central regional workshop on natural organic substances at University of Minnesota-Minneapolis.

Kevin Mandernack, assistant professor of chemistry and geochemistry, has received a National Science Foundation CAREER Award. This is the second NSF CAREER Award received by the Chemistry and Geochemistry Department this year; the first went to Dan Knauss, assistant professor.

Ginny Mast, geology museum curator, was a guest curator for the "Rivers Run Through It" art exhibit at Foothills Art Center. The exhibit is open through March 12.

Ilya Tsvankin, geophysics professor, is technical program co-chairman of the 9th International Workshop on Seismic Anisotropy in Houston in March. He was also elected chairman of the Translations Committee of the Society of Exploration Geophysicists. ■

Colorado School of Mines in the 21st Century

Advances in biotechnology will likely be the economy's driving force.

By Leah McNeill
Director, Public Affairs

We are starting the century of biology, according to the Institute for Genome Research, whose president predicted in *Business Week* last year that advances in biotechnology will be the driving force behind the economy of the 21st century.

This opinion is echoed by others in government and higher education. National Science Foundation Director Rita Colwell coined the term "biocomplexity," which refers to the integration of research in the life, physical and social sciences with advanced technology. Harvard-affiliated economist Juan En-

"enabling technologies." Combining research in these areas produces advanced technologies which in turn enable new scientific discoveries to occur in an iterative manner. "Integrating the technologies creates exponential growth," he says.

Ferris gives the example of gene chips, which are the product of the escalating interplay between molecular biology, information processing and advanced materials. Used as a medical diagnostic tool, the silicon chips have genetic detector probes bound to the silicon by photolithography. Suspect genetic material is treated and passed on to

allowing new bone to cement together the patient's existing bone and the implant. The size of the pores can be better controlled by manufacturing them in microgravity conditions.

CSM's role in the integration of technologies is especially significant, Ferris points out, because the school is also educating the discoverers who initiate the whole process. "It is imperative that our state education system continue its tradition of graduate education, producing our next generation of discoverers," says Ferris, who is concerned about Colorado maintaining its leading edge in the technology marketplace.

To promote further technology integration, CCHE is working with all three state research universities to form a consortium called the Colorado Bioengineering Alliances. "This program was actually initiated here at Mines by Dr. Shoureshi," Ferris explains. "Mines, CSU, CU-Boulder and the Health Sciences Center each bring strengths to the table. We are looking at bioengineering in a multidisciplinary and a multi-institutional manner, which could lead to development of a model for such enterprises."

Bioengineering is also being considered for inclusion at the site of the former Fitzsimmons Army Medical Center that is being redeveloped into a new health sciences complex. "Bioengineering will be an important component in leveraging Fitzsimmons," Ferris says.

Ferris's enthusiasm for the biotechnology thrust stems in part from his own professional experience. A Ph.D., he conducted research in cellular biology for the U.S. Army, both at Fitzsimmons and at Letterman Army Institute of Research in San Francisco. "I personally have seen where technology integration can lead us," he says. "It's hard to convey how exciting it is and how beneficial the work will be to mankind." ■

"It will knock the socks off the information technology revolution. It may take a while, but the signs are there."

Chuck Ferris
Colorado Commission on Higher Education
predicting the biological economic revolution.

riquez Cabot has predicted that "a significant and increasing chunk of the world economy will be dominated by the life sciences."

Closer to home, Chuck Ferris, bio-science programs director of the Colorado Commission on Higher Education (CCHE) also predicts that the next economic revolution will be biological. "It will knock the socks off the information technology revolution," he says. "It may take a while, but the signs are there." For example, the programs of the technology advancement group (TAG) at CCHE were audited in 1999 by national reviewers, who recommended that bioengineering be pursued and integrated with TAG programs in advanced materials and information technology.

It is this integration that will make bioengineering a driving force in the global economy, according to Ferris. Biotechnology, information technology and advanced materials are what he terms

the chip where it binds, or hybridizes, with the probe.

The probe then detects a specific genetic disease or its cause, such as bacteria. This technology will ultimately enable the rapid detection of a particular genetically caused disease or disease-producing pathogen—an important step in recognizing genetic diseases for which gene therapies will eventually provide a cure. (For more on gene chips, go to <http://www.affyrmatrix.com>.)

CSM Professor Rahmat Shoureshi's research on remote sensors for diabetics who have lost sensation in their feet is a local example of technology integration. So is the work on porous bone implants being conducted by the CSM Center for Commercial Application of Combustion in Space. Bone implants are usually glued together, but the advanced materials and processes being used by CSM researchers Frank Schowengerdt and John Moore create a stronger bond by

Reunion Weekend 2000

Host Hotel: Denver Marriott West Hotel. For reservations: (800) 444-2206 or (303) 291-3637 by April 19. (Mention CSM Alumni Reunions). Hospitality Room open each day.

ACTIVITIES INCLUDE:

THURSDAY

Lunch at Buffalo Rose, Golden
Graduating Senior Banquet

FRIDAY

Commencement
Reunion Golf Outing
Experimental Mine Tour
National Earthquake Information Center Tour
Reunion Classes Social Hour and Dinners

SATURDAY

Alumni Breakfast
Ocean Journey
All Alumni Banquet

For more information or to make reservations: (303) 273-3290; (303) 273-3295; (800) 446-9488, ext. 3290 (8 a.m.-5 p.m. MST); or e-mail csmalumni@mines.edu.

May 3, 4, 5 and 6

A special weekend is planned for the classes of 1940, 1945, 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985 and 1990.



Please Join Us!

Are any of your classmates on this list of those already planning to attend Reunion Weekend? If so, why not join them May 3-6, 2000?

1940: Russell Badgett, Jr., Logan V. Caldwell, Milton E. Danitschek, John B. English, Lynn D. Ervin, Paul V. Fillo, Marvin E. Gantz, Jr., Walter E. Heinrichs, Jr., P. K. Hurlbut, Robert Wm. Knapp, William M. Mueller, Joseph L. Oberle, Howard Schmuck and A. W. "Dub" Warren.

1950: John J. "Jack" Abendschan, Donald G. Ashe, Douglas F. Benton, Tyler Brinker, F. D. Burnside, David L. Caldwell, Keith G. Comstock, Cleveland Dear, Jr., Arthur S. Dickinson, Henry P. Ehrlinger III, F. E. "Casey" Endacott, L. Luke Fournier, Dennis E. Gregg, Niles E. Grosvenor, Marvin R. Hewitt, Hermann A. Hofmann, William H. Hommel, Charles W. Irish, John A. Jameson, Donald L. Johnson, Andrew G. Keleher, Clyde W. Kerns, David M. Mathews, John D. McIver, Charles E. Melbye, George L. Miller, William L. Payne, Glenn J. Poulter, Herman T. "Ted" Schassberger, Richard C. Siegfried, Edward M. Warren, John R. Weyler and John H. "Jack"

1955: Frank Aiyama, Parks Bunn, Chet

Love, Willard T. Danker, Richard H. Dreith, Frank K. Gibbs, Fred J. Gruberth, John P. McKenzie, Jr., Chester F. Norstrom, Jr., Robert E. Smith, Richard L. Stallings and Don J. Thorson.

1960: Gerald Askevold, Tom Carroll, Robert R. Cederstrom, Edwin H. Crabtree III, Richard A. Daniele, Bill Engel, Clyde W. Frost, S. Bruce Heister, G. Wesley Hoagland, A. L. Holmes, George C. Kane, Walter I. Knudsen, Jr., Forrest G. Loper, Dennis B. O'Neil, Jack H. Pizante, Carl William Samuel, John B. Smith Jr. and R. Glenn Vawter.

1965: Charles "Jeff" Babcock, Robert J. Barday, Ernest L. Bradley, Frank Erisman, Richard C. Hecox II, James B. Huddleston, Barry Quakenbush, Gordon M. Quick, George R. Stephan and John R. Zak

1970: Lee F. Burson, Charles D. Crew, Robert K. Nichols, David R. Northrup and Robert C. Scharp, Bob Slusher,

1975: Carl E. Cross, Damian C. Friend, R. S. Gaide, Joseph J. Garbee, Ronald E. Lengerich, James McCune, Michael

L. McGonagill, George Puls, Paul J. Shattuck, Dean D. Stoughton and William A. Warfield.

1980: Michael J. Banschbach, Frank A. DeLuca, Jr., Dave DeSonier, James C. Ferguson, Victoria (Loepp) Ferguson, John H. Gould, Sharon L. Hart, Phyllis Fett Halvorson, Debra G. (DeTurk) Lawless, Thomas G. Merriam, Steve W. Patton, Brian W. Rothkopf, Mark A. Wolf and Genevieve B. C. Young.

1985: John W. Anthony, C. Mitchell Cox, Glen M. Gallo, William A. Gilbert, Darren E. Hadley, Elizabeth L. Key, Teresa Muhic, Barbara Slayman, Jeff Styers, George H. Wayne Jr. and Colleen R. Wilkinson.

1990: Jason D. Brockel, Jennifer E. Day, John H. Fronczak, Tony Gangemi, Julia B. Hoagland, Patrick W. Hochanadel, Jeannette A. Jones, Larry Krahl, Ken Lykens, C. Renée Milliken, Claudio Mingelli, Shirley A. Smuda, Stephen A. Smith and Nancy P. Yeagley. ■

February

2 **Houston Section.** The Met Business and Sport Club, One Allen Center in Houston. 6:30 p.m. Cash bar, hors d'oeuvres and \$10 per person).

10 **Golden Lunch Bunch.** An informal lunch get-together of CSM alumni the second Thursday of every month at the Buffalo Rose in Golden, Colo., corner of 12th and Washington, 11:30 A.M.-1 P.M. Order from the menu.

17 **Grand Junction Section Lunch.** An informal lunch get-together of CSM alumni the third Thursday of every month at the Bookcliff Country Club. 2730 G Road. Call for further information: John Howe, (970) 242-4903 (B) or Del Tolen, (970) 256-1118 (B).

22 **Mines Basketball at Metro State in Denver.** Buffet starts at 6:15 P.M. in the Metro Gym.

March

9 **Golden Lunch Bunch.** An informal lunch get-together of CSM alumni the second Thursday of every month at the Buffalo Rose in Golden, Colo., corner of 12th and Washington, 11:30 A.M.-1 P.M. Order from the menu.

10 **"Dolphins" at the Imax Theater,** 7 P.M., Denver Museum of Natural History, 2001 Colorado Blvd. Adults \$7; children and seniors (60+) \$5. Call (303) 273-3959 for reservations.

16 **Grand Junction Section Lunch.** An informal lunch get-together of CSM alumni the third Thursday of every month at the Bookcliff Country Club. 2730 G Road. Call for further information: John Howe, (970) 242-4903 (B) or Del Tolen, (970) 256-1118 (B).

Denver Section Luncheon, Southeast Area. 11:30 A.M., Metropolitan Club, 7800 E. Orchard. \$20. Guest speaker Jim Gusek BSc Min '73. Call (303) 273-3295 for reservations.

April

1 **Mines Varsity-Alumni Soccer Match.** Brooks Field. 2 P.M.

6 **Houston Reception for Dr. Bickart.** Location and time TBA.

9 **Bone Valley (Florida) Alumni Gathering.** Mine tour at 1 P.M., barbecue at 2 P.M. Call Dick Holmes for details at (941) 553-6634.

13 **Golden Lunch Bunch.** 11:30 A.M.-1 P.M. Buffalo Rose in Golden, Colo. Order from the menu.

15 **"Bus Stop" at the Source Theater.** 8 P.M. Denver Center for the Performing Arts, 1050 13th Street.

CSM community-wide art show. Arthur Lakes Library. Through May 6.

20 **Grand Junction Section Lunch.** An informal lunch get-together of CSM alumni the third Thursday of every month at the Bookcliff Country Club. 2730 G Road. Call for further information: John Howe, (970) 242-4903 (B) or Del Tolen, (970) 256-1118 (B).

27 **Mines Choir Concert.** 7 P.M. Friedhoff Hall (FREE).

May

4-6 **Reunion**

9 **Astros vs. Rockies.** 7:05 P.M. \$12 per person. For tickets, contact Vicky Jackson (713) 297-1223 or vicky.jackson@us.pes-intl.com. 11:30 A.M.-1 P.M. Buffalo Rose in Golden, Colo. Order from the menu.

11 **Golden Lunch Bunch.** 11:30 A.M.-1 P.M. Buffalo Rose in Golden, Colo. Order from the menu.

18 **Grand Junction Section Lunch.** See listing under Feb. 17 for details.

June

8 **Golden Lunch Bunch.** 11:30 A.M.-1 P.M. Buffalo Rose in Golden, Colo. Order from the menu.

15 **Denver Section Lunch, Southeast Area.** 11:30 A.M. Location TBA.

Grand Junction Section Lunch. An informal lunch get-together of CSM alumni the third Thursday of every month at the Bookcliff Country Club. 2730 G Road. Call for further information: John Howe, (970) 242-4903 (B) or Del Tolen, (970) 256-1118 (B).

csm.aa.mines.edu/alumni

In Their Own Words: Mines Men in the Korean War

By Steve Vornick

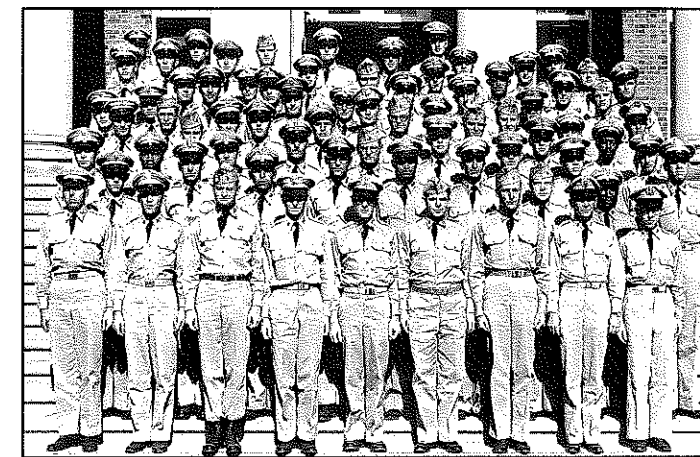
The following is the first of a two-part account of the Korean War (June 1950-July 1953) based on recollections of Mines men who served in Korea during that conflict. The article was prepared with the assistance of Norman R. Zehr EM '52, MSc Min '56, Medalist '77, Hon Mem '98, former director of the Colorado School of Mines Alumni Association and assistant editor of the three-volume Encyclopedia of the Korean War.

On June 25, 1950, infantry and armored units of the North Korean People's Army surged across the 38th parallel into South Korea. The bloody, three-year-long war that followed affected millions of Americans, but none more directly than the 1.5 million American military personnel who rotated in and out of wartime Korea. The war altered the plans and lives of more than 380 graduates and students of the Colorado School of Mines who served in the U. S. military from 1950-1953. For those Miners who served in Korea in combat and combat-support roles, the war was a landmark event that helped shape not only their own lives, but the geopolitics of the latter half of the 20th century.

When the Korean War broke out in 1950, the military was already well represented at Mines. Many students were World War II veterans who attended Mines with the help of the G. I. Bill. Some were discharged, while others maintained military connections as reservists. Many non-veteran underclassmen had also joined reserve or national guard units to earn a few dollars to help meet school expenses.

Army military science instruction had begun at Mines in 1873. An Army Reserve Officer Training Corp (ROTC) program, one of the first four in the United States, was established at Mines in 1919. In the 1930s, thanks to the prominence and excellence of its ROTC program, Mines was known as the "West Point of the Rockies." By 1950, the Mines ROTC program had graduated hundreds of second lieutenants into the U. S. Army. All non-veteran students were required to take two years of ROTC.

When the Korean War mandated a threefold increase in the size of the U. S. Army, the newly-formed Department of Defense reactivated the draft and called up many reserve and national guard units. A deferment arrangement allowed Mines students to continue working toward their degrees, provided



The 55th Associate Engineer Company officer class, Fort Belvoir, Virginia, 1952.

they remained active in the ROTC program, which would lead to Army commissions and induction into active service upon graduation.

During the Korean War, most Mines men who entered military service ended up in the Army Corps of Engineers, the ideal place to apply their engineering skills. But Mines men also served in all branches of the military as everything from infantrymen and seamen to cartographers, supply officers and pilots. During the war, not all Mines men in the military actually served in Korea. Many were assigned to duty stations in places like Europe, Alaska, Japan and the Philippines. Together, their enormously varied duties reflected both the broad scope of the Korean War effort and the buildup of national defense capability during the early years of the Cold War.

The Korean War originated in the political chaos that followed the Japanese surrender at the end of World War II. When Japan, which had forcibly occupied Korea since 1910, relinquished control, the peninsula was arbitrarily divided into zones of Soviet and American occupation, north and south of the 38th parallel. The Soviets installed a communist government in the north with Kim Il Sung, a Korean exile who had lived in the Soviet Union, as premier of the Democratic People's Republic of Korea. When American efforts to unify the country under a republican regime failed, the Republic of Korea—South Korea—installed Syngman Rhee as president in a free election.

North of the closed border, the Soviets trained and equipped a large army, then withdrew, challenging the United States to withdraw its troops from the south. Lacking funds to support further Korean operations, the U. S. Army withdrew its occupational forces in June 1949.

One year later, the North Korean People's Army (NKPA) crossed the 38th parallel in an attempt to forcibly unify the country under communist rule. In an emergency session, the United Nations Security Council voted to send troops to support South Korea. The U. N. troops were dominated by American forces and commanded by Gen. Douglas MacArthur.

The surprise NKPA invasion caught the Republic of Korea

continued on next page



The main street of Chonan, Korea, May 1953.

continued from previous page
 (ROK) troops and their handful of American military advisers by surprise. Emergency reinforcement by undertrained and poorly equipped American troops was not enough to turn back the overwhelming numbers of NPKA troops and armor that quickly captured Seoul and Taejon.

Within a month after the initial invasion, NPKA forces had advanced south more than 300 miles and were poised to take Pusan, the last United Nations toehold on the Korean mainland. In desperation, the U. N. defense stiffened, forming a flexible defensive line known as the Pusan Perimeter.

Army 2nd Lt. **John H. Mason Met E '49**, who later became a lieutenant colonel, took part in that initial fighting withdrawal. A platoon leader in a 25th Infantry Division engineer battalion, Mason recalled those chaotic early weeks of the war. "Arrived in Korea in July 1950, during the withdrawal south into the Pusan Perimeter. We provided engineer line company support during retrograde action building or blowing roads and bridges, laying mine fields to create obstacles, and fighting as infantry."

U. S. A. F. Capt. **Wendell F. Edwards EM '48**, who had served in World War II in China and India, was an army engineer in Korea. He had witnessed grave suffering in World War II and was again appalled at how quickly war disrupted food supplies and services and displaced millions of citizens. "My most vivid recollections of Korea are of the extreme hardship experienced by native civilians."

The Pusan Perimeter was a classic defensive military action. In six weeks of intense fighting, American forces suffered their highest casualty rates of the entire war. But the Pusan Perimeter held, buying invaluable time to bring in supplies and rein-

forcements and to plan counteractions.

The U. N. counteractions were swift and decisive. In a risky and daring amphibious landing, MacArthur put ashore 70,000 U. N. troops at Inchon, just west of Seoul and far behind NKPA lines.

Army Col. **Irvin M. Rice EM '39 MSc Min '47**, who had landed in France on D-Day in 1944, spent a month in Japan on MacArthur's planning staff preparing for the Inchon invasion. Rice commanded the 37th Engineer Beach Group, which stormed ashore at Inchon Sept. 15, 1950. "This landing far in the rear of the North Korean Army came as a complete and disastrous surprise to that army, then mostly engaged in far south Korea attacking Pusan. Our landing cut the North Korean supply lines and forced a hasty retreat back across the Han River."

Shortly after the Inchon landing, MacArthur received orders to cross the 38th parallel, destroy the NKPA and unite Korea under the government of South Korea. Within one month, Gen. Walton Walker's U. S. 8th Army had fought its way north to capture the North Korean capital of Pyongyang.

An airdrop by the 187th Airborne Regimental Combat Team north of Pyongyang was too late to rescue a trainload of U. S. prisoners of war. Miner John Mason, who had participated in the withdrawal to the Pusan Perimeter and was now a first lieutenant commanding a 25th Engineer Battalion (1st Cavalry Division) bridge platoon played an unusual role in the airdrop. "On the breakout of the perimeter after the Inchon landing, we supported the advance north. When we got to the 38th parallel, I was given the bridge and assault platoons. Took the bridge platoon with a floating bridge north past Pyongyang and past the 187th Airborne

making its first combat jump—that was probably the first time an airborne outfit was ever supported by a bridge platoon!"

By Nov. 20, 1950, advance elements of the U. S. 8th Army had moved to within sight of the Yalu River and the Manchurian border. Meanwhile, MacArthur had opened a second front on the east coast of Korea by landing X Corp at Wonsan, which also rapidly advanced northward.

With supply lines overextended and the cold Korean winter setting in, U. N. forces suddenly faced a new and formidable adversary—the unexpected entry into the war on Nov. 26 of 320,000 Chinese regulars. Once again numerically overwhelmed, U. N. forces fell back across the 38th parallel.

John Mason, now an army captain, remembers that second retreat. "We withdrew again on entry of the Chinese in November 1950. Erected a float bridge on the river in Pyongyang for withdrawing units—the bridge was blown as last units crossed. I recall the weather after the Chinese joined. It was as cold as I have ever been and finally when it warmed up it was the opposite extreme—hot, dusty, smelly. Similarity with Vietnam. In Nam you were never really sure who the enemy was."

Meanwhile, in eastern Korea, hordes of Chinese troops forced X Corp into a withdrawal that became a brutal fight for

for two more years.

American disagreement on war policy became apparent in April 1951, when President Harry Truman relieved MacArthur of command for making unauthorized statements that advocated all-out victory. Ridgway replaced MacArthur as commander of U. N. forces, until he was replaced by Gen. Mark Clark in May 1952.

Peace talks began July 1951, but broke down repeatedly. Meanwhile, bitter fighting continued, and names like Bloody Ridge and Heartbreak Ridge became part of the military lore of the Korea War.

Army Sgt. **H. Boyd Moreland EM '56**, who fought with the 7th Cavalry Regiment of the 1st Cavalry Division, remembers being "cold, tired, hungry. And hot, tired, wet and scared. Once or twice traveled by foot, on top of tanks, by truck and plane from the Naktong almost to the Yalu. Then walked south. Then back north to the Chorwon vicinity and the Imjin River. We defeated a large communist Chinese force at Singchang-ni on the night of 29-30 Nov., 1950, thus helping to prevent encirclement of the 8th Army. There were numerous other actions. I was a rifleman, machine gunner, gunner on 60mm mortars, assistant squad leader, assistant platoon sergeant, and commo sergeant. I was a BAR

"Built and blew up bridges; built and blew up roads; built fortifications and blew up fortifications... Got hot and wet and learned all about cold, and all about hot dust and cold dust, and warm mud and freezing mud."

Spencer R. Titley Geol E '51

survival. In November 1950, Pvt. **Melville J. Coolbaugh EM '54**, a veteran of the Inchon landing, had advanced with the 31st Regiment (7th Infantry Division) deep into eastern North Korea. Coolbaugh recalls the bitter fighting at the Chosin Reservoir in temperatures as low as -24° . "In North Korea we participated in the earliest actions against the Chinese at the Fusen Reservoir. As part of a regimental combat team consisting of two reinforced battalions, we moved to the east side of the Chosin Reservoir where we were attacked by what we later learned to be two Chinese divisions. We fought them off for five days and four nights, then withdrew. I was wounded lightly three times and suffered frostbite, but survived the withdrawal to Hagaru-ri. Then I fought with the surviving provisional Army unit attached to the 7th Marines during the breakout to the coast."

In the fighting withdrawal from the Chosin Reservoir, the 7th Marines and its attached Army units suffered more than 4,400 battle casualties and 7,300 non-battle casualties mostly caused by frostbite. After hospitalization, Coolbaugh fought again with the 31st Infantry Regiment into the summer of 1951, before returning to the States for discharge as a sergeant first class.

On Jan. 4, 1951, advancing North Korean and Chinese troops recaptured Seoul. But in February and March 1951, the new U. S. 8th Army commander, Gen. Matthew Ridgway, launched a massive counteroffensive that drove the communist forces back north to the 38th parallel. Thereafter, battle lines remained relatively stable, although fierce fighting continued

[Browning automatic rifle] man the longest—six months."

First lieutenant **Alfred A. Lee EM '50** was one of many Mines men who put their engineering skills to use for the U. S. Army. "Designed and built double-line aerial tramways to carry ammo up and wounded down, one of which we named 'A Bridge to Mars.' Cleared minefields of Chinese wooden box mines, and was

continued on next page



Lt. Bob "Tex" Owen '51 (left) and three Korean laborers at the Paris Mountain road construction site near Mochan, Korea in 1953.

continued from previous page
awarded the Bronze Star. Cleared minefields in advance of the 6th tank battalion in the drive toward Kumsong."

Army 1st Lt. **Spencer R. Titley Geol E '51, Medalist '75**, who served with the 194th Combat Engineer Battalion, remembered the general discomfort and the repetitive construction and destruction. "Built and blew up bridges; built and blew up roads; built fortifications and blew up fortifications. Laid mine fields and blew up or took up minefields. Laid wire and blew it up. Got hot and wet and learned all about cold, and all about hot dust and cold dust, and warm mud and freezing mud. Learned how to traverse a rice paddy quickly in summer and how to hide in one in winter. Learned what they smelled like and why. Learned that there was no way to bridge a river in flood and that a floating bridge cannot sustain a current in excess of 12 ft/sec (in spite of what they say). Learned about engineer reconnaissance in the light of the moon, and the dark of the moon."

Army 1st Lt. **Tyler Brinker PE '50** served with the 3rd Engineers, 24th Infantry Division. "We built tranways for medevac and supplies up the Korean mountains, just like at Silverton [Colorado] for the mines."

In Korea, the U. S. Army actually had two jobs—fighting a war and training the ROK Army. **Robert W. Meader Geol E '51**, a first lieutenant engineer officer served with the Korean Military Advisory Group (KMAG) as an instructor with the ROK Army Engineers School at Chinhae.

When the war began, accurate, reliable maps of Korea were nonexistent. Maps used for tactical purposes literally had to be

made from scratch, a job that utilized the skills of Mines men like Army 1st Lt. **Paul J. Fritts Geol E '52**, a cartographer with the 420th Engineer Aviation Topographic Battalion.

Fritts's classmate at Mines, Army 1st Lt. **William F. Oline Geol E '52**, a pilot with the 30th Engineer Aviation Topographic Battalion, felt fortunate not to experience combat. "Since nobody shot at me and I loved flying, my service time was generally enjoyable."

But Korea offered more than enough combat to go around. Marine 1st Lt. **James D. Jerrell EM '52** faced combat as a forward observer with the 11th Marine Artillery Regiment, 1st Marine Division. First Lt. **Robert W. MacCannon Met E '51 EM '54** saw combat as an engineer officer with the 187th Airborne Regimental Combat Team.

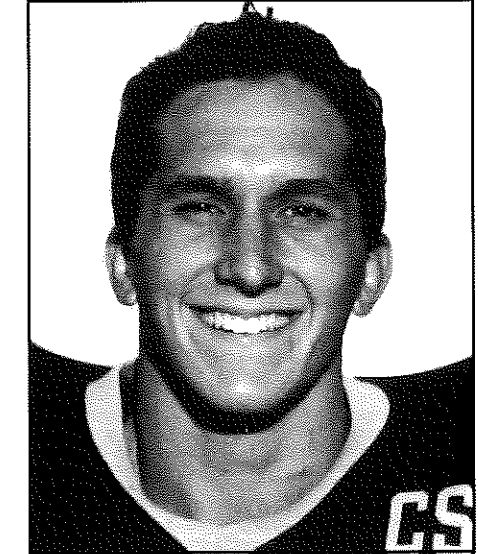
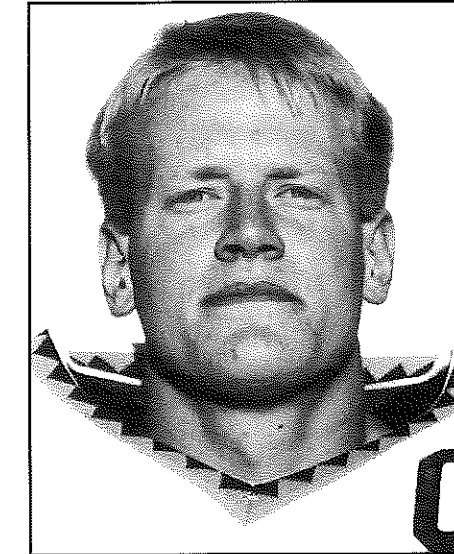
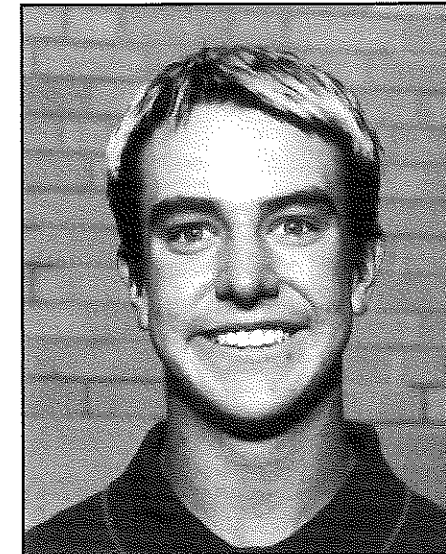
James V. Bonds EM '52, a first lieutenant with the 1169th Combat Engineer Group, distilled his recollections of Korea to what he felt were its basic fundamentals. "Mud, snow, ice and water."

Keith G. Comstock Met E '50 MSc Met '58, a first lieutenant with the 3rd Infantry Division who later became a colonel, took things a bit further, summing up his Korean wartime experience in words with which most servicemen would certainly agree. "My recollections of Korea are of being cold most of the time and devastated by the constant casualties."

Steve Voynick is a freelance writer from Leadville, Colo. His most recent book is Climax: A History of Colorado's Climax Molybdenum Mine. During 1964, Voynick served with Charlie Battery, 4th Bn., 76th Artillery (7th Infantry Division) at Munsan-ni, Republic of Korea.

30 CSM Student-Athletes Named Academic All-Conference for Fall 1999

By Jeff Duggan
Sports Information Director



From left, golfer Jack Sayers and football players Justin Murray and Forrest Buckner all earned perfect 4.0 grade point averages.

Colorado School of Mines had 30 student-athletes named Academic All-Rocky Mountain Athletic Conference for the fall of 1999. Included on the list were three men's golfers, 10 football players, seven cross country athletes (four women, three men), five men's

soccer players, four volleyball players and one member of the men's tennis team. Furthermore, golfer Jack Sayers and football's Justin Murray and Forrest Buckner all earned perfect 4.0 grade-point averages.

In order to be named Academic All-

RMAC, a student-athlete must have a 3.2 or better cumulative grade-point average, be a starter or key reserve on their team and must have been a student at their school for at least two consecutive semesters.

Orediggers Place Eight On Fall All-RMAC Teams

By Jeff Duggan
Sports Information Director

Eight CSM athletes were named to All-RMAC teams following the fall sports season. Junior forward Marc Miller was named First Team All-RMAC in men's soccer after finishing the season tied for third in the conference with 28 total points (13 goals, two assists). For Miller, who also ranked second in goals per game with .72, this season marked the third time in as many years that he had been named All-RMAC. Miller was a First Team selection in 1998 and a Second Team choice following his freshman campaign in 1997.

Football's Sam Brubaker, a senior defensive lineman (45 total tackles, 3.0 sacks) was selected Second Team All-

RMAC while senior Kelly Taga (offensive lineman) and junior linebacker Matt MacRostie (team-leading 87 tackles) were both named Honorable Mention All-RMAC.

The volleyball team, which won seven of its final 10 matches, was honored with four selections to the 1999 All-RMAC Volleyball Team. Freshman outside hitter Laurie Alzheimer earned Second Team all-conference laurels and was named RMAC Co-Freshman of the Year. Senior outside hitter Sabrina English, middle blocker Heather Booker and outside hitter Coree Kammerzell (both sophomores) were named Honorable Mention All-RMAC, as well.

Academic Awards Luncheon Scheduled

Mines will hold its annual Academic Awards Luncheon Feb. 17 to recognize those student-athletes who excel in the classroom.

Student-athletes are recognized at three levels—bronze, silver and gold—based on their grade point averages for both semesters of the previous calendar year.



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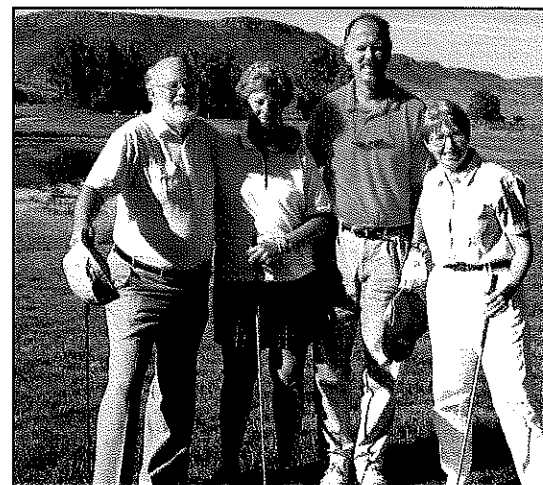
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Among last year's 110 participants were, from left, Ed Warren '50, Debbie Mooney, Steve Sonnenberg '81, and Mary Jo Giddings.

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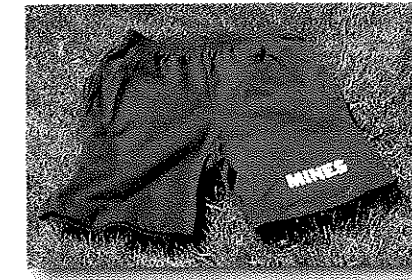
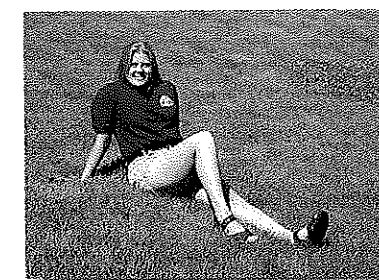
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Spelunking in Lechuguilla Cave

A Mines graduate helps map and explore the greatest new cave discovery in 50 years. He is one of a select few researchers and explorers allowed inside.

By Maureen Keller

Lechuguilla Cave is full of spectacular formations such as this one. Photograph by David Harris/HPS.

Wriggling through tunnels barely big enough for a man's body, rappelling down jagged cliffs and slowly traversing slippery, slime-covered rocks, all in complete darkness more than 1,000 feet beneath the surface of the Earth may sound like a nightmare to some. But to Paul Burger BSc Geol '91, MSc Geol '99, it's the job of his dreams.

Burger is a hydrologist at Carlsbad Caverns National Park. One of his duties is to help researchers collect samples in Lechuguilla [lech uh GEE yah] Cave, the greatest cave discovery in the past 50 years. "Not a day goes by where I don't think 'I can't believe I'm paid to do this,'" he says. The discovery and exploration of Lechuguilla Cave is an exciting one fraught with danger and intrigue. That story is told by Burger and three co-writers in a recently published book, *Deep Secrets*.

Lechuguilla Cave, named for a blue-green plant in the agave family found in the surrounding area, is located in the Guadalupe Mountains of southern New Mexico on national park land. Despite the discovery of nearby Carlsbad Caverns 100 years ago, Lechuguilla remained unknown, except as a shallow cave where bat guano was harvested in the 1800s.

In the mid-1950s, a park ranger visiting the cave noticed a strong wind blowing through rocks at the back of the cave and recorded his observation in a report. In the late 1970s, members of the Cave Research Foundation (a private, non-profit group dedicated to promoting the long-term preservation of caves) came across the report and decided to check it out. Caves react to changes in barometric pressure, so strong winds indicate the presence of an extensive network of passages. When the pressure falls, air inside the cave rushes out. When pressure rises, air rushes in. The larger the cave, the more wind rushes in or out as the cave tries to reach equilibrium.

Digging at the back of the small cave began in earnest in 1984. Work was sporadic as expeditions had to be arranged when people were off work, usually during holidays. In 1986, the diggers finally broke through and were awestruck by what they found.

During this time, Burger was growing up on Air Force bases around the country. In the early 1980s, his family moved to Colorado and to keep her children occupied for the summer, his mother signed them up for a spelunking class, although she didn't know what it was. Burger says he was afraid of heights, the dark, and was also claustrophobic. But he conquered his fears and, he says, "I started caving in 1984 and have been caving almost every weekend since then." In 1988, he made his first trip to Lechuguilla.

Lechuguilla Cave was formed by sulfuric acid rather than carbonic acid like most other caves. Rising hydrogen sulfide from nearby oil fields mixed with water from the surface to create sulfuric acid. The acid ate away the limestone, forming the cave. The enormous cave—more than 100 miles of corridors have been mapped so far—contains some of the most beautiful

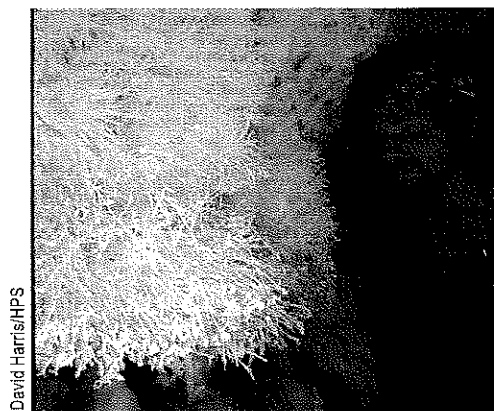
selenite crystal stalactites ever found. It also has the longest soda-straw stalactite, more than 24-feet long compared to the previous record-holder of 8 feet. Although not part of the original team to discover the cave,

Burger has chartered previously unexplored territory and has been able to name some of the cave's rooms, passages and pits.

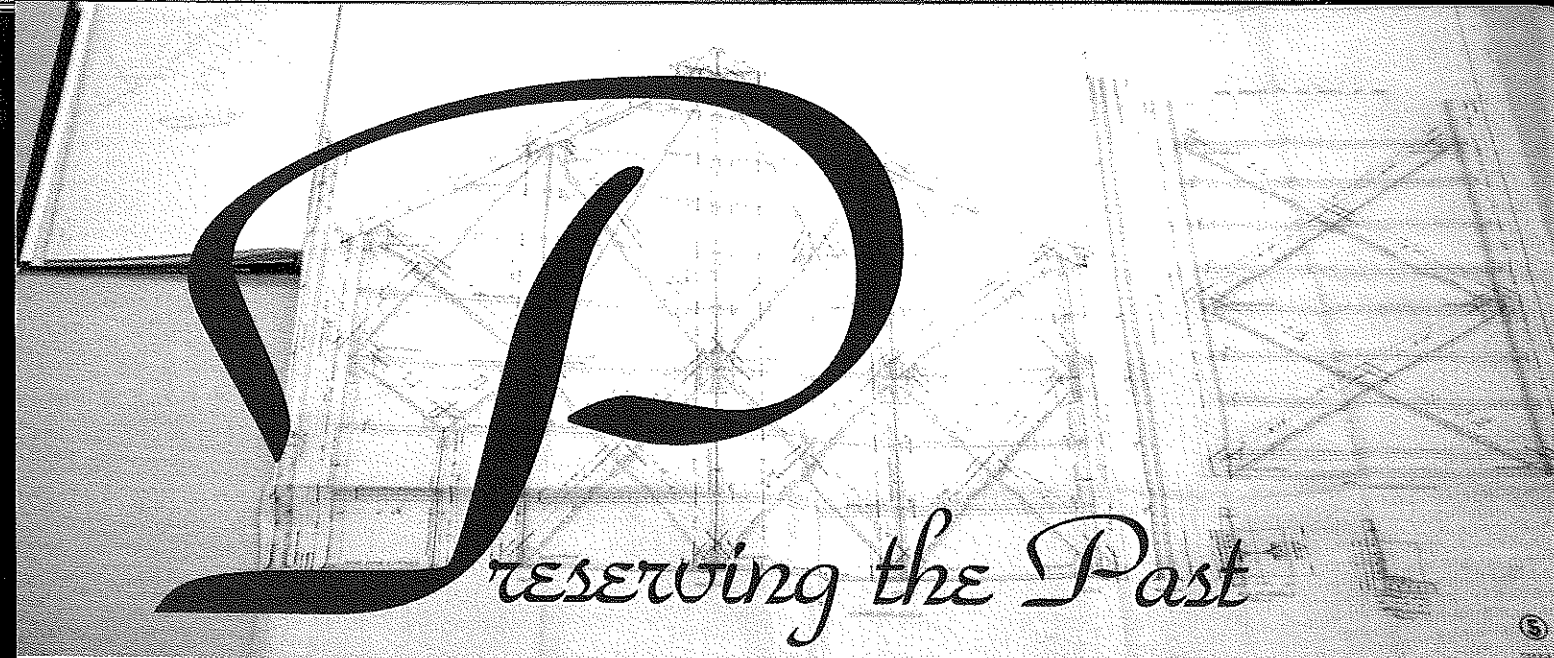
The discovery of Lechuguilla Cave caused enormous excitement among the caving community, but six months after it was penetrated, in-fighting among various parties interested in exploring the cave caused the park to close it for a year. It is now classified as a research-only cave and is not open to the public. Only six expeditions are allowed per year with no more than 12 members on each expedition. "The environment is so sensitive to traffic," Burger says. In the past, fabulous discoveries were quickly exploited and caves were badly damaged. "The thrill of cutting-edge exploration just creates that excitement," he continues. It's difficult to stop oneself from forging down passages where no other human has ever been.

In addition to mapping and exploring on his own time, Burger helps conduct research projects in the cave. One of the projects is a study of microbes that grow on rocks and pools within the cave. "These microbes are using rock as food to survive in an extreme environment. There's a possibility of these types of microbes being found on Mars so NASA is interested," he says. "There's a potential for those microbes to be used to fight cancer. They are so aggressive, some microbes will consume leukemia cells."

Burger came about his dream job at Carlsbad Caverns by following his heart. While still an undergraduate, he started taking a week off every other month to explore the cave. "It didn't help my grade point," he says. "But it became my priority. I thought, 'What will I remember in 15 years: what I got on a physics exam or how I explored Lechuguilla?'" The answer is obvious. ■



Paul Burger views a spectacular crystal inside Lechuguilla Cave.



Preserving the Past

The art of preservation and restoration of documents requires an appreciation of historical materials, an understanding of chemistry and a lot of patience. Margaret Katz, collections conservator at Arthur Lakes Library since 1992, has the necessary qualifications and has risen to the challenge of caring for a collection of documents, much of it more than 100 years old and just sitting on shelves until her arrival. The library has been used by thousands of people over the years, she notes, "And many things are just falling apart from use."

During her working day, Katz sits in a spacious room awash with natural light on the lower level of the library. She may spend the day piecing together tiny torn fragments of an ancient map, for example, restoring it to a readable condition. She may carefully separate stuck-together pages of an old book. Or she may spend her time strengthening new publications before they are shelved for use by the CSM community.

Katz came to preservation and restoration by a circuitous route. She received a bachelor's degree in French from Alfred University in New York, but took many art courses including one on the chemistry of materials. After graduation, she headed for Tulane University to pursue a master's in French, again using her electives to study art. While at Tulane, she began working for the library in special collections and her first project was restoring French colonial manuscripts. After graduation, she stayed on the job, took more art courses and had a sort of apprenticeship in preservation and restoration.

After three years at the Tulane library, Katz moved to Colorado and found no openings in any libraries. She took a job with Amax Mining Co. in Nevada, pulling samples from drill rigs and readying gold samples for the lab. When the documents job opened at CSM, she was prepared with a background in both preservation and mining.

Restoring old and worn documents is a time-consuming, painstaking process. Documents are washed in water and scrubbed with soft brushes to remove old paste. They are stored in a humidifier that has below 30 percent relative humidity and are weighted with stones to flatten. Seams and rips are re-

paired with rice paper and wheat starch paste. "We try to restore as much as possible to the original," Katz explains.

"To me, tape is the worst invention," Katz continues. "It discolors paper and dries it out. We have to use solvents to get it off. If there is one thing I'd like to impress on people, it's to not use tape to repair important documents."

Katz is also responsible for storage of at least one copy of all graduate student theses produced at Mines. "The early ones were mine reports," she says. "A lot contain photos and were handwritten with hand-drawn maps and diagrams. The work is beautiful. "As of early December, the number of theses in the library was 5,310. Because the old theses are historically valuable, the collection is stored in a vault.

Katz doesn't worry that she'll ever run out of work. In addition to what is already in the library, gifts are always being made, adding to the library's collection. Recently, Rocky Flats donated an entire semi-trailer full of documents. In the mining industry, the Arthur Lakes Library collection is world famous, Katz says. Her task is to keep it in usable condition. ■



CSM's first dissertations were hand-written documents with finely drawn maps and diagrams like the one pictured at the top of the page by students named Colbran and Richards. It was submitted in 1902 and is a design for the bracing and roof of a boiler house. Above, Margaret Katz restores a badly damaged map using a process that is painstaking and time-consuming.

ON THE MOVE

1939

Sigmund L. Smith Met E, MSc Met '47 is retired and lives in San Diego.

1940

Lester Newhouse Geol E is retired and lives in Springfield, Va.

Howard K. Schmuck Jr. Met E is retired and lives in Arvada, Colo.

1942

Neal N. Beckner PE is retired and lives in Grand Junction, Colo.

1943

Charles D. Reese EM is retired and lives in Colorado Springs, Colo.

1948

Daniel Pavone Met E, MSc Met '51 is retired and lives in Wheat Ridge, Colo.

1950

Richard G. Martin Geol E is retired and lives in Roswell, N.M.

John R. Weyler PE is a management consultant for various firms and lives in Denver.

1951

Paul A. Bollheimer Geop E has retired. He lives in Houston.

E. Geoffrey Jeffreys Geol E is president and chief executive officer of The Jeffrey's Co., Inc. in Daphne, Ala.

Roger A. Richter EM is president of Western Underwriters, Inc. in Parker, Colo. and lives in Denver.

James C. Ternahan Jr. Met E is retired and lives in Grand Junction, Colo.

1952

James H. Bright Geol E has retired from Cazador Investments and lives in Reno, N.V.

William H. Isaacs PE and his wife Earline have retired in Lafayette, La.

1953

Richard H. Mandel PE is president of Cross D Bar Trout Ranches, Ltd. He lives in Denver.

Roger A. Peck PRE is retired and lives in Grand Junction, Colo.

Raymond Shucavage EM is retired and lives in Grants, N.M.

1954

M. Kent Miller Geol E, MSc Met '59 is retired and lives in Kerrville, Texas.

1956

Joseph R. Dunbar PE is president of Mountain States Pressure Services, Inc. in Littleton, Colo.

1958

John T. Corson Geop E is in China for three months on contract with the Asian Development Bank performing a feasibility study on a proposed 1,000 km railroad.

James B. Mollison Geol E is retired and lives in Pierre, S.D.

Stanley G. Young Met E is senior research scientist for NASA in Orlando, Fla. He lives in Titusville, Fla.

1959

George N. Krauss Met E is retired and lives in Malvern, Ohio.

F.H. Merelli PE is chairman and chief executive officer for Key Production Company, Inc., in Denver.

1966

Roger W. Derby MSc Met, MSc Phy '66, DSc Met '68 is retired and lives in Oak Ridge, Tenn.

1968

David R. Canning EM has returned to the United States from Saudi Arabia where he was working and is more or less retired and living in St. George, Utah.

Cliff Kangas Met E is vice president of engineering for Zemex Industrial Minerals. He lives in Spruce Pine, N.C.

1969

William A. Abbott PE, MSc Pet '74 is chief petroleum engineer for Petron Development Co. in Lakewood, Colo.

Dennis A. Dechant BSc Math is vice president of engineering for Northwest Pipeline Corp. in Denver.

Frederick J. Hebein Math E is a professor at California State University in San Bernardino.

Robert K. Spangler II BSc Met is claims manager for Acme Steel Co. He lives in Saint John, Ind.

1972

Claude C. Corkadel III BSc Met is manag-

er-special products for Mobil Oil Corp. He lives in Oakton, Va.

Michael G. Long BSc Pet is project general manager for PB Amoco Exploration in Sundbury-on-Thames, Middlesex, United Kingdom. His e-mail address is LongMg@bp.com.

Pamela R. Tittes BSc Met, MSc Min Ed '77 is a consultant for Tittes Construction Consulting, L.L.C. in Denver.

1973

Alan C. Billard BSc Pet is drilling manager for BP Amoco in Houston.

James L. Green BSc CPR is a facilities engineer at the Rocky Mountain Arsenal in Commerce City, Colo. He lives in Thornton, Colo.

David G. McDowall EM is maintenance and land superintendent for Homestake Mining Co. He lives in Spearfish, S.D.

Victor J. Miller BSc Geol is an engineering manager for Kinross Gold U.S.A. in Salt Lake City.

1974

Stanley J. Gradisar BSc Min is an associate and a patent attorney for Holme, Roberts, & Owen LLP. He lives in Littleton, Colo.

Timothy M. Hawkes BSc Min is a self-employed mining consultant. He lives in Louisa, Ky.

Alexander M. Homenuke BSc Geol is self-employed as a professional engineer. He lives in Mount Lehman, British Columbia, Canada.

Thomas R. Kelly BSc Min, M Eng Min '95 is president of Andes Nevada Mining Corp. He lives in Savannah, Ga.

Edward J. Meier Jr. BSc Math is manager of systems development for Ball Corp. He lives in Broomfield, Colo.

1975

Steven S. Anderson BSc Geop owns Kin-nickinnick Exploration, a geophysical consulting company in Lafayette, La. that concentrates on Gulf Coast development and exploration projects.

Hoy E. Frakes Jr. BSc Met is plant manager for SPS Nonferrous in Las Vegas.

Richard J. Schlager BSc Chem, MSc Met '75 is vice president, government programs, at ADA Environmental Solutions and lives in Aurora, Colo.

1976

Raymond E. Bailey BSc Geol is senior

project engineer for M.K. Ferguson Corp. He lives in St. Charles, Mo.

Michael Carney BSc Geol is a manager for Schlumberger, Ltd. He lives in Houston.

James P. Edler BSc Met is president and CEO of SiNeramics, Inc. in Ferndale, Mich.

W. Durand Eppler MSc Min Ec is vice president of Newmont Mining Corp. and president of Newmont Indonesia, Ltd. He lives in Denver.

David S. Hass BSc Met, a senior engineer for ARINC, lives in Shawnee, Okla.

1977

Allen E. May BSc Geop is project director, global procurement for BP Amoco p.l.c. in Sundbury-on-Thames, Middlesex, United Kingdom. His e-mail address is mayae@aol.com.

Sharon G. Roness BSc Min is senior mining engineer for Jacobs Ranch Coal Co. in Gillette, Wyo. She lives in Newcastle, Wyo.

1978

Michael J. Dern BSc Pet is a freelance consultant. He lives in Evergreen, Colo.

David A. Saegart BSc Min is plant engineer for Rio Grande Portland Cement Co. in Tijeras, N.M. He lives in Albuquerque, N.M.

1979

David W. Casselberry BSc Min is chief economist, corporate planning for Phillips petroleum Co. in Bartlesville, Okla.

Bruce W. Cavender BSc Met is president of advanced operations Management, Inc. He lives in Tucson, Ariz.

Gregory M. Henningsen BSc Geop, MSc Geop '84 is systems analyst for Forest Oil Corp. He lives in Lakewood, Colo.

Timothy L. Hoops BSc Geol has been named director and is also the president and chief executive officer of Kestrel Energy, Inc., in Denver.

William D. Hissem BSc Min is product manager for Sandvik Tamrock L.L.C. He lives in Rex, Georgia.

Peter B. Papazian MSc Geop is an electrical engineer for the National Telecommunications Information Administration in Boulder, Colo. He lives in Golden, Colo.

Pete J. Weader BSc Chem is treasurer of Dupont Dow Elastomers in Wilmington, Del.

1980

Debra J. (Bollacker) Batory BSc Geol is

senior analyst for Burlington Resources in Midland, Texas.

Douglas Gable BSc Geop, M Eng Geop '87 is employed by Kinnickinnick Exploration in Lafayette, La.

Thomas E. Jordan BSc Geop, MSc Geop '87 is vice president of exploration for Key Production Company, Inc. and lives in Lakewood, Colo.

Douglas S. McKittrick BSc Met is senior metallurgical engineer/product safety officer for Western Forge Corp. in Colorado Springs, Colo.

Kenneth W. Snodgrass BSc CPR is general manager of Equiva Trading International LLC in Houston.

Mark A. Wolf BSc CPR has recently been promoted to technical manager with Air Products in Calvert City, Ky. Previously he was production superintendent with Air Products at its chemicals plant in Wichita, Kan.

1981

Robert L. Cline M Eng Min is director of engineering at Marathon Technical Services and lives in Summersville, W.Va..

George B. Gilfillan BSc Min is a contract analyst for BHP World Minerals. He lives in Farmington, N.M.

Maj. Paul A. Groven BSc Min and Connie G. (Barnes) Groven BSc Min '83 live in Olympia, Wash. Paul is a pilot at McChord Air Force Base.

Jorge C. Lira BSc Met, MSc Met '83 is managing director for Energotec S.A. in Lima, Peru.

Wanda J. (Eaton) Snodgrass MSc CPR is senior reservoir engineer for Chevron U.S.A. in Houston.

Charles R. Wagner BSc Pet works for the Apache Corp. as senior reservoir engineer in Houston.

1982

Joseph R. Albi Jr., BSc Pet, MSc Min Ec '86 is vice president of engineering for Key Production Company, Inc., in Denver.

Roger M. Flahive BSc Pet, MEng Pet '84 is executive vice president of Shenandoah Energy in Denver. He lives in Littleton, Colo.

Barbara L. Ganong BSc Pet is petroleum engineer for EOG Resources, Inc. in Denver.

Donald Gudczaskas BSc Met, MSc Met '84 is product manager for Uyemura International Corp. in Southington, Conn. He lives in Terryville, Conn.

Katherine J. Heinlein BSc Math is senior

geophysicist for ARCO Alaska, Inc. in Anchorage, Alaska.

David D. Keanini BSc CPR is general manager of engineering for Western Gas Resources. He lives in Westminster, Colo.

Steven M. Gruver BSc Pet is vice president/general manager for ENSCO Offshore Co. in Broussard, La.

1983

J. Daniel Applegate BSc Min is a graduate teaching assistant in the mining engineering department at University of Missouri-Rolla.

John E. Bain BSc Geop is president of Galileo Geophysics, Inc. in Houston.

Mark A. Balderston BSc Pet is southwest-ern Wyoming area superintendent for Santa Fe Snyder Corp. in Baggs, Wyo.

G. Timothy Fisher II BSc Met is senior engineer-minesite service program for Henkel Corp. He lives in Sierra Vista, Ariz.

David S. Hallman BSc Geol is senior project engineer for Golder Associates. He lives in Evergreen, Colo.

Dennis M. Jones BSc Min is area manager for American Mine Services, Inc. He lives in Denver.

Steven Plybon MSc Geop is managing director for Maio-Plybon Giosciences, L.L.C. in Dallas. He lives in Plano, Texas.

Michael F. Winter BSc Geol is a design engineer manager for Morrison Knudsen Corp. He lives in Littleton, Colo.

1984

George R. Clough BSc Geop is staff accountant for Reed Barker and lives in Parker, Colo.

John M. Kirkpatrick BSc Geop is director of information systems for Sunrise Medical in Longmont, Colo.

Joseph T. Nelson BSc Pet is operations manager for LGI-COLOG in Golden, Colo.

Bret R. Siepman BSc Geol is an independent geologist/geophysicist in Englewood, Colo.

1985

Linda A. Battalora BSc Pet, MSc Pet '88 is an attorney for Victor J. Boog, P.C., in Lakewood, Colo.

Jerome A. Bollinger BSc Math is project engineer for Zimmerman Metals. He lives in Golden, Colo.

John T. Campbell BSc Pet is Turkey opera-

tions manager for Perenco. He and his wife Sherry live in Littleton, Colo.

Erik E. Hansen BSc Geol is senior hydrogeologist for Equilon Enterprises LLC in Houston.

Russell A. Kappius BSc Geop is president and principal consultant of Seisware Solutions Inc. in Littleton, Colo.

Robert E. Moore BSc CPR is complex manager for Valero Refining in Texas City, Texas.

Gerald "Winston" Tripp II BSc CPR is an emergency medicine physician for Western Emergency Physicians in Littleton, Colo.

Benjamin R. Saunders BSc Eng is a mechanical engineer for Maxtor in Longmont, Colo.

David Seymour BSc Met is chief metallurgist for Newmont Gold Co. in Denver.

Douglas S. Tudor BSc Math is service delivery manager for Shell Services International. He lives and works in Houston.

1986

Steven L. Durfee PhD Geochem is senior scientist for Anesta and lives in South Jordan, Utah.

1987

Daniel W. Donoho BSc Geop is chief geophysicist for Resource Solutions LLC. He lives in Lakewood, Colo.

1988

Jeffrey A. Block BSc Eng is an information systems engineer for Experimental and Applied Sciences (EAS). He lives in Lakewood, Colo.

John J. Cambuzzi BSc Eng is manager of technical services for Johns Manville Corp. He lives in Lakewood, Colo.

Eric S. Danas Geop E is product designer for Microsoft Corp. He lives in Redmond, Wash.

Jill M. (Kristan) Donoho BSc CPR is director of business development for Nexus Resource Corp. She lives with husband **Daniel Donoho BSc Geop '87** in Lakewood, Colo.

Robert E. Farrar BSc Eng is project manager for Black and Veatch.

Richard E. Jones BSc Min is in sales with Naico Exxon Energy Chemical in Park City, Utah.

Bruce G. Karr BSc Geop is a geophysical analyst for Fairfield Industries. He lives in Littleton, Colo.

David R. Kennar BSc CPR, MSc CPR '90 is

process engineer for Equilon Enterprises, LLP in Martinez, Calif.

Richard C. Landsdowne BSc Min is project engineer for Phelps Dodge Morenci, Inc. He lives in Tucson, Ariz.

David J. Lillo BSc Pet is district manager for Patina Oil & Gas and lives in Littleton, Colo.

Christopher E. Papadakis BSc Geop is an environmental consultant and an antique dealer. He lives in West Lawn, Pa.

Joel D. Schneyer MSc Min Ec is president of Mercantile Resource Finance, Inc. in Parker, Colo.

E. William Worthington BSc Geop, PhD Geop '92 is research associate for University of Alaska-Fairbanks, Geophysical Institute.

1989

Remo A. Baptista BSc CPR is senior research and development engineer for Monopol Ltda in La Paz, Bolivia.

Colin M. Engle BSc Geol, Geol E '96 is taking an MSc course in reservoir evaluation and management at Heriot-Watt University in Edinburgh, Scotland. He will finish in October and plans to work in the United Kingdom.

Matthew W. Erker BSc Geop, MSc Env Sc '91 is a manager for Carter & Burgess and lives in Lakewood, Colo.

Craig Friesen BSc Eng is project engineer for MK Centennial Engineering in Denver.

Gary E. Grove BSc Pet, a senior planning engineer for Enron Corp., lives in Houston.

Tom R. Hergert BSc Met is configuration control authority for Rocky Mountain Remediation Services in Golden, Colo.

Richard C. Hugo BSc Met is a post-doctorate associate at Los Alamos National Laboratory in New Mexico.

Christos I. Ismailidis BSc Eng is productivity engineer for The Vineyard at Strawberry Ridge in Warren, Conn.

Laura A. Laffoon BSc Chem is a teacher at PS1 Charter School in Denver.

1990

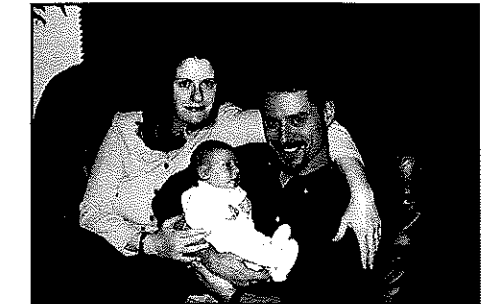
Katherine T. Clemence Burger M Eng Geol is hazardous substance engineering geologist for California Department of Toxic Substances Control in Sacramento, Calif.

Larry A. Cramer BSc Met is chief consulting metallurgist-concentrators for Anglo American

Platinum Corp. in Johannesburg, South Africa. His e-mail address is lcramer@amplats.co.za.

Claudio Mingelli MSc Geop is a geophysicist for Western Geophysical in Houston. His home is in Napoli, Italy. His e-mail is claudio.mingelli@wail.com.

Scott Muller MSc Env Sc is a senior research engineer—software for Storage Technology Corp. and lives in Broomfield, Colo.



Steve BSc Met and Penny (Hill) BSc Met Ouellette have a daughter, **Deirdre Morgan**, born Sept. 13 in Longmont, Colo.

Bryan R. Young BSc Met is project manager for JT Thorpe & Son. He lives in Sandy, Utah.

1992

William T. Beltz Jr. BSc Met is a metallurgical service engineer for Rouge Steel in Dearborn, Mich.

Robert W. Dalton BSc Eng is staff engineer for Infinite Engineering and lives in Scottsdale, Ariz.

Wendy K. (Moore) Hahn MSc Mat Sc is a member of the technical staff at Los Alamos National Laboratory, New Mexico.

Lisa BSc Math and Bryan BSc Min '91 Mortimer had a daughter, **Grace Jan. 7**. She weighed 8 lbs. 11 oz. and was 20 in. long.

U.S. Marine Capt. **James Kyle Roudebush BSc Eng '92** is assigned to Marine Tactical Electronic Warfare Squadron One in Incirlik Air Base in Turkey where he flies the **EA-6B Prowler**.

Kenneth E. Telleen Hydrogeol is project hydrologist for Delta Environmental and lives in Naperville, Ill.

Gary D. Witt M Eng Geol is a hydrogeologist for Wright Water Engineers, Inc. He lives in Littleton, Colo.

1993

Evan R. Anderman M Eng Geol, PhD Geol '96 is principal hydrogeologist for Calibra Consulting and lives in Denver.

Clarice M. Blaylock BSc CPR is staff engineer for EnecoTech, Inc. in Denver. She lives in Arvada, Colo.

Adrian M. Jacobsen BSc CPR is production engineer for Fina Oil & Chemical Co. in Carville, La. He lives in Baton Rouge, La.

William A. Johnsen BSc Eng is a software engineer for Raytheon Systems Co. and lives in Littleton, Colo.

Geoffrey J. Philipson BSc Eng works for Gates Rubber Co. as an application engineer. He lives in Poplar Bluff, Mo.

Khuzema Sulemanji BSc CPR is an engineer for Texas Instruments Inc. and lives in Houston.

1994

Theresa L. (Daniels) Alleman BSc Chem, MSc Chem '98 is a laboratory manager in the chemical engineering department for CSM and lives in Lakewood, Colo.

Sabine B. (Molden) Brueske BSc CPR is process engineer for the U.S. Department of Energy. He lives in Seattle.

Jason L Buesing BSc Eng is back with Recycled Materials Co. in Arvada, Colo. as a civil/environmental engineer.

Justin L. Cunningham BSc Eng works for ASI RCC, Inc. as operations engineer in Buena Vista, Colo.

Ronald W. Kuehne BSc Met is plant metallurgist for Sheffield Steel Corp. and lives in Sand Springs, Okla.

Mark L. Ulmer BSc Pet, BSc Eng '97 is a petroleum engineer for Scientific Drilling Inc. and lives in Chino Hills, Calif.

1995

Peter A. Gintautas Ph.D. Geochem is technical manager for organic analysis for Paragon Analytics, Inc. in Ft. Collins, Colo.

Andrea (Castle) Koy BSc Math works for Coors Brewing Co. in logistics and supply chain management in Golden, Colo.

Michelle Dawn Lettota BSc Eng works for USWest as a design engineer in Littleton, Colo.

Bennie P. Mondragon BSc Math is systems engineer for Advanced Business Consultants Inc. in Mission, Kansas.

Cynthia M. (Joyce) Pascua BSc CPR is senior principal engineer for Safe Sites of Colorado in Golden, Colo. She lives in Arvada, Colo.

Andrew C. Perry MSc Met, PhD Met '98 is a researcher at Bethlehem Steel Corp. and lives in Lebanon, N.J.

Eric B. Scheidemantel MSc Min Ec is a major in the U.S. Army. He lives in Lenox, Mo.

Navy Lt. **Brian L. Tothoer BSc Geop** is on a six-month deployment to the Mediterranean Sea and Arabian Gulf aboard the fast-attack submarine *USS Scranton*.

Norio Yuki MSc Met is a senior research engineer for Japan Steel Works, Ltd. in the Invar Project Team in Muroran, Japan. His e-mail is nyuki@nikko-metal.co.jp.

1996

Edward A. Adkins BSc Eng is a mechanical engineer for U.S. Filter in Colorado Springs, Colo.

L. Michael Cheeseman BSc Geol is an analyst for Simmons & Co. International in Houston.

Kjell D. Moe BSc Geol is an engineer for Ground Engineering and **Cynthia R. (Marshall) Moe BSc Eng '98** is a construction administrator. They live in Arvada, Colo.

Hannah J. Moore BSc Met is senior engineer for Polaroid in Bedford, Mass.

Robert R. Nolan BSc Eng is a mechanical engineer for JC Chang and Associates. He lives in Long Beach, Calif.

1997

Angela M. Baron BSc Geop is office engineer and schedule engineer for Kiewit Western Co. in Glenwood Springs, Colo.

Jeff Scott Brown BSc Eng is a manufacturing engineer for Volant Sports in Denver.

Maj. **Charles H. Lunati MSc Min Ec** is an operations research analyst for the U.S. Army in the Pentagon. He lives in Alexandria, Va.

Skye (Stock) MacCarthy BSc Geol is a staff geological engineer for Harding Lawson Associates in San Jose, Calif.

Jeffrey A. Sterling MSc Min Ec is a major in the U.S. Army and lives in Fairfax, Va.

Naomi E. Watnick BSc Eng is systems developer for eCollege.com in Denver.

1998

Andrew D. McAuley BSc Eng is a mechanical engineer for Echostar in Englewood, Colo.

Christine N. Beiriger BSc Pet is production engineer for AERA Energy in Bakersfield, Calif.

Michael P. Dolan BSc Geochem is an exploration geochemist for Mobil Exploration and Production U.S. in New Orleans.

Jeffrey E. Henry BSc Pet is a petroleum engineer for Devon Energy Corp. in Oklahoma City.

Glendon A. Jacques BSc Eng is an analyst for Andersen Consulting L.L.P. He lives in San Leandro, Calif.

Kevin J. Kidd BSc Min is business manager for Bechtel Mining and Metals in Englewood, Colo.

Tiffany L. Maier BSc Eng is a controls engineer in the Austin site services/semiconductor products sector of Motorola, Inc. She lives in Austin, Texas.

Travis T. Moore BSc Eng is an associate engineer for Black and Veatch in Aurora, Colo.

Dusty Lynne Mosness BSc Phy is a law student at University of Colorado and lives in Golden, Colo.

Preston K. Reichert BSc Eng is a construction project engineer for SeaWest Wind-Power, Inc. in San Diego.

Patrick D. Sandoval BSc Eng is an engineer for Kiewit Network Services Co. in Golden, Colo.

J. William Zuckerman BSc Eng works for Omnitech Robotics as a mechanical engineer in Englewood, Colo.

1999

Atsushi Akaike PhD Min, who lives in Edgewater, N.J., is an associate for PricewaterhouseCoopers LLP, in Teaneck, N.J.

Karen L. Dennis BSc Eng is a piping design engineer for Bechtel in Gaithersburg, Md.

William V. Fehringer MSc Engr Sys is a senior software engineer for Lockheed Martin Astronautics in Denver.

Lisa N. Gonzales BSc Min is an associate engineer for EMC2 in Phoenix.

Brad D. Kosmicki BSc CPR is a crew training engineer for Bechtel Bettis in North Charleston, S.C.

Marcus W. Lathrop BSc CPR is an environmental engineer for Motorola Corp. in Austin, Texas.

Julio E. Rincon S. MSc Min Ec is project director for Quimica Venoco, C.A. in Miami. He lives in Edo. Carabobo, Venezuela.

John B. Sion Jr. BSc Eng is a structural engineer for MNA, Inc. in Lakewood, Colo.

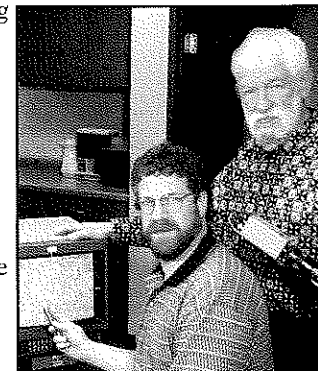
Michael A. Varco BSc CPR works for Hyundai Semiconductor America in Eugene, Ore.

Nathan A. Wanstrath BSc Min is production manager for New Point Stone Company Inc. in Greensburg, Ind. He lives in Batesville, Ind.

Joy Zhang BSc CPR is an analyst for Andersen Consulting LLP. ■

Schwartzbergs Analyze Why Bad Things Happen

John Schwartzberg BSc Met '88 (seated) is in the failure-analysis business with his father, **Fred Schwartzberg Met E 53**. "It's engineering detective work," John Schwartzberg explains. "It's like putting a puzzle together. Sometimes the pieces aren't there and you have to recreate what happened." In addition to determining why events occurred, the Schwartzbergs can also prescribe suitable repairs.



A case they recently worked on involved a weight-lifter whose equipment failed, dropping a heavy weight on his foot causing a serious break. It turned out the equipment was designed and built by a group of weight-lifters. They had come up with a great idea, but never really had determined what was necessary to make the product safe. "We often run into situations like this," Schwartzberg continues. "We see lots of products that were never engineered. We call them 'Billy Bob' products." Failures of equipment such as this underscore the importance of having a product engineered to ensure safety.

The elder Schwartzberg began the firm, Emtech located in Denver, in 1983. He had been employed in the aerospace business with Martin Marietta, but wanted to get back into engineering.

"About that time, I was bailing out of the broadcast news business," says John, who has journalism and political science degrees from University of Colorado-Boulder. "I stumbled into going back to school for an engineering degree."

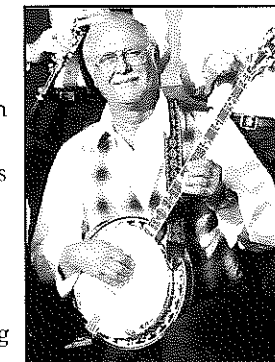
After graduation from Mines, John also went to work for Martin Marietta. But by 1992, the company was downsizing and John decided to join his father. "It's very interesting," he says of his work. "Every day is different. We rarely see the same problem."

The one thing that concerns him, though, is to see an accident that didn't need to happen. "It's bothersome professionally and distressing personally," he says. "Some companies feel it's cheaper to litigate and pay the occasional jury award than to spend the time and money to design a safe product."

On the other hand, Schwartzberg says, "It's gratifying when companies come to us before disaster happens. I wish more companies would do that."

Hildebrandt '59 Leads a Dixieland Band

An engineering consultant by day and a musician by night, **Warren Hildebrandt Geol E '59** blends his interests in science and the arts. As a consultant, Hildebrandt, formerly an executive with Getty Oil Co., manages business and technical services for the California Manufacturing Technology Center and provides business and technical services. As a musician, he is one mean banjo player.



Hildebrandt was attending someone else's retirement party when the idea of taking up the banjo first came to him. Asked what he would do when he retired, he responded that he would play in a band. For the next several days he gave the idea serious thought and because he'd always loved Dixieland jazz, decided on the banjo. "About five years later I finally got one," he says. "I

learned to play it, became good enough to play in public and formed a band."

Today, his Coyote Hills Jazz Band makes about 100 appearances annually throughout Southern California. They appear every Wednesday evening at Spaghetti Station, 999 West Ball Road in Anaheim, Calif., near Disneyland. They also appear in festivals, jazz clubs and on radio and television.

The seven-piece band includes trumpet, clarinet, trombone, drums, tuba and piano in addition to Hildebrandt on the banjo. Hildebrandt and some others also do vocals. Their music is traditional Dixieland jazz and blues from the early 1900s and includes songs by Louis Armstrong, Jelly Roll Morton and Irving Berlin. "The band's repertoire boasts more than 500 songs as heard in saloons, in dance halls, along the New Orleans waterfront and on the concert stage," the group's press kit states.

"What I looked for in New Orleans—but found in Los Angeles," says one fan, S. Decble of Sidney, Australia.

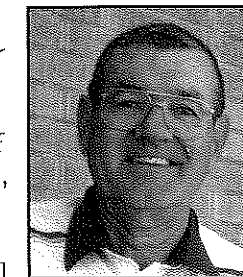
The Coyote Hills Jazz Band also has a recording, "At the Station," which has sold worldwide and received significant praise. To purchase a copy, contact Ivory Music Productions at 800-781-7277.

Pearson '59 Combines Love of Mines, Athletics

After only five months as an engineer, **Bob Pearson PE '59** knew he wanted to do something else. But he never regretted his education at CSM. In fact, he made the school his career.

"I came to Mines because of my math teacher, Mrs. Pennington, at Wheat Ridge [Colorado] High School," Pearson recalls. "She tried to get all her students to come to Mines."

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Pearson wanted to be a teacher so he started at Colorado State College of Education (now University of Northern Colorado). After only one quarter, he dropped out and enlisted in the U. S. Navy to serve in Korea. During his enlistment, he witnessed the test of the hydrogen bomb.

After returning to Colorado, Pearson decided to try CSM and chose petroleum engineering as his major. "I didn't like it," he says. "But I was too stubborn to quit." Along with his engineering studies at Mines, he also pursued his real interest—sports. "I loved the athletics," he says. "I was a half-miler on the track team. I played basketball. I was the football manager my senior year. And I also directed the Barbs [non-Greeks] in intramurals and we usually won the trophy."

To pay off his college loans, Pearson became a test engineer for American Machine and Foundry (AMF), the contractor for the lift mechanism on Titan II missiles. Several months later he was offered the job of recreation director for the City of Golden and he accepted. "I took a 50 percent cut in pay to do this," he says, "but I thoroughly enjoyed it." Five years later, in 1966, he returned to Mines as a coach and business manager and stayed until his retirement in 1998.

"I coached baseball, basketball, softball, soccer, tennis, intramurals and helped with track," he recalls. He was assistant basketball coach for 26 years during which time the team won two conference championships. But the highlight of his career, he says, was coaching soccer. In his last five years of coaching, the team won four conference championships: two in the Rocky Mountain Intercollegiate Soccer League, one in the Colorado Athletic Conference, and the final year in the then newly-formed Rocky Mountain Athletic Conference (RMAC). Pearson's overall coaching record in soccer was .491, just shy of his goal of winning 50 percent of his games. "But the record is probably as

good as any for a team sport at Mines," he adds.

During his soccer-coaching days, Pearson also put his engineering skills to good use by designing portable goal posts, still used on campus today.

In retirement, Pearson continues his association with CSM. He has served on the board of directors for the Alumni Association and is currently a member of the credit union board. He also is sections manager for the Alumni Association organizing CSM alumni groups throughout the world.

Gilbert '97 Is Part of Peace Effort in Kosovo

Christopher Gilbert BSc Eng '97 is currently an engineer in one of the world's hot spots supporting the U. S. military effort to keep peace. He works for Brown and Root Services in Ferizaj, Kosovo [formerly Urosevac] designing and building base camps for the military. "This is the largest base camp built for deployment of U. S. troops since Vietnam," he says. About 5,000-7,000 U. S. troops are stationed in the area. "The military is the only law right now. Kosovo plans on having an election in late 2000."



Gilbert's four-year contract to work in Kosovo began in July, four days after his wedding. His wife, who also works for Brown and Root, lives in Houston. Every three months Gilbert gets a week off for a one-week European vacation. Once a year he gets three weeks back in the States. He earns it by working 12 hours a day, seven days a week. "There's not much else to do here," he says. Americans must follow certain rules and bars are mostly off-limits. "There's not much of a night life."

Life in Kosovo is difficult. "Right now, conditions aren't good," Gilbert



Kosovo has mountains to rival Colorado's.

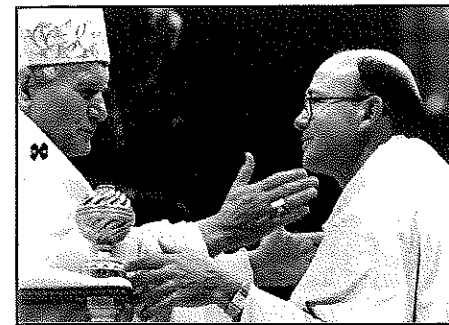
says. "Usually we don't have power or heat so a lot of people sleep in their offices at night." Generators keep U. S. facilities supplied with power. And sometimes hostilities still erupt. "When I first got here, there was lots of retaliation against Serbians [by local Albanians]. Twenty or 30 houses were burned every day. Now that it's winter, it's a lot better," he says, "but the other day, a 76-year-old Serbian man and his wife were beaten and killed."

Local reaction to the troops is positive, Gilbert says. "The locals have become pretty familiar with the troops." Gilbert and the other Americans in Kosovo work mostly with ethnic Albanians. "We've tried to hire Serbians but it hasn't worked out well," he says. "They are too scared to come to work."

Brown and Root puts its employees up in local housing and they live off the local economy. In addition to building infrastructure, Brown and Root supplies the military with food, power, heat and other necessities. "We're here to serve the military," Gilbert explains, "so that all they have to do is keep the peace."

Meaden '58 Finds Calling Within the Church

At the age of 43, Paul Meaden Geol E '58 had a good job making good money working on the Alaska pipeline. At the same time, he was depressed and felt something was missing from his life. He was healthy physically, but was unsatisfied spiritually. A radical change was needed, he decided, so he wrote to the abbot of Our Lady of Guadalupe, a



Meaden, right, at his ordination by the Pope in 1984.

Benedictine monastery in New Mexico. Today, he is both a monk and a priest and spends his days praying and doing good works.

"A monk is a person who professes to a monastery," explains Meaden. "I decided as long as I'd made the commitment, I might as well go all the way." So he spent two years at a seminary in Los Angeles, then was ordained by the Pope in Rome.

Meaden is vice president to the abbot and has administrative duties. And as the monastery's only engineer, he is in charge of facilities expansion, contracting, and that sort of task. "I have a drawing board," he says. "And I can still do strength calculations. Those years at Golden come into play."

As a priest, Meaden has traveled all over the world. In 2001, he will spend several months studying in Italy learning to speak Italian "so I'm not entirely lost in international meetings. It helps to be bi- or trilingual."

As a theologian, Meaden says he looks to people like Albert Einstein, Alfred Eddington and Alvin Toffler who, in addition to being scientists, understood the need for humans to develop their spiritual sides. "I use them because of my background," he says. "The physical laws are also the divine laws."

Reuter '79 Teaches the 3 Rs

Dan Reuter CPR '79 has found his calling teaching children to read, write and do basic arithmetic. "I love it," says the recently hired first-grade teacher. "It takes as much skill to teach as it does

to be a chemical engineer."

Reuter should know because for 12 years he worked as a chemical engineer and says the skills he learned at Mines have served him well. "I know where the kids are now and where they need to go," he says. "Learning to read is as hard as learning chemistry." In fact, he continues, it's a lot like engineering if you compare the alphabet to the elements and learning to form words with learning the elemental table.

Much to his surprise, Reuter says, he learned the importance of language arts after graduation. "I had to write like mad as an engineer." Being a successful engineer, he says, requires organization, communications, people skills, and knowing your field. His first career helped him "get a good feel for what people need to know."

Reuter's parents were educators so perhaps he was born to be an educator himself, although they at first discouraged him from becoming a teacher. After 12 years of engineering, Reuter decided to enter Word to the World Bible College in Denver. "I'd always wanted to do it," he says. At the college, an instructor recognized his talent for teaching and encouraged him to pursue it. So last spring, Reuter enrolled at Metro State to earn a teaching license.

After graduation, Reuter was a substitute teacher before being hired permanently and discovered he likes the lower grades. For a short time he taught science, a subject that he was knowledgeable about because of his "superb engineering background from Mines." But it was the younger children that drew him. "I know how to keep them engaged," he says. "I know how to make learning fun."

Henry '61 Raises Alpacas

After 30 years with Polaroid, the life of Bruce Henry Met E '61, Medalist '92 has taken a different turn. Henry and his wife, Lori—a former software specialist—have become farmers in retirement. (She is the sister of Larry Preble PRE '61, Medalist '98.) What they raise at their Wilpaca Farm are alpacas.

"We purchased land in Wilton, New



Bruce Henry with alpacas Vanessa (white) and Contessa.

Hampshire to build a second home," Henry says, "and had no intention of starting an alpaca business. In fact, we didn't know anything about alpacas!" But now, the couple has a second career.

Alpacas, cousins to the llamas and part of the camelid family, are "the most user-friendly livestock animals in the world," says Henry. "They are docile, friendly and make a pleasant humming sound." They are almost "potty-trained," too, in that they all use a common dung area.

An alpaca weighs about 150-175 pounds and unlike the llama, which is primarily a pack animal, are raised for their wool. "Once a year we shear them," explains Henry. "They produce luxurious fibers. The fiber is cashmere-like in quality, very fine and hollow, with a good insulation quality." Legend has it that alpacas, native to Peru, were the property of Inca kings who had exclusive use of their wool for weaving clothing.

Alpaca wool comes in 15 natural colors

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 ors—from white to black with silver, maroon and many fawn and brown shades in between. The fiber can also be dyed. Each animal produces between five and 10 pounds of fiber a year, enough to make several sweaters. Most people who are allergic to sheep's wool are not allergic to alpaca. The Henrys sell the wool to local spinners and also sell knitting kits on the Internet (www.wilpacafarm.com). They are also members of the Alpaca Fiber Cooperative of North America. The Henrys were instrumental in forming a New England chapter of the National Alpaca Owners and Breeders Association, which promotes the alpaca industry.

In addition to selling the fibers, Henry also breeds and sells the animals. Alpacas are no longer imported from South America and all alpacas in the United States must be born and raised here. In 1995, only about 100 alpacas inhabited all of New England on seven or eight farms. Today, there are 60 farms in New England with about 1,000 alpacas. Henry's herd consists of six male alpacas and 21 females. Last year they produced six babies, called cria. Next year Henry expects 11.

Alpacas also make fine pets, says Henry. They are shown at county fairs and are often led through obstacle courses to show off their versatility. "Nine out of 10 times, they're led by children," he says, emphasizing their ease of handling. "They are just beautiful animals, as cute as they can be."

Henry and his wife name all their animals. Their most recently born cria is named Sorpresa (Spanish for surprise) because she came unexpectedly, well ahead of her projected due date.

Henry explains that he took up raising and breeding alpacas for two reasons: he loves animals and wanted to earn extra income in his retirement. And, he happily reports, he has made a profit the past two years. "It represents a new and different venture from the corporate world," says Henry, who attended Har-

vard Business School after Mines. "It has the same business issues that all businesses have," but also offers something else. "If you would enjoy the lifestyle of farm and livestock without the rigors of slaughtering and 6 A.M. milkings, alpacas offer a lovely choice."

Jones Lemire '83 Sails, Plays Saxophone

Alison Jones Lemire MSc Geol '83 enjoys the outdoor life even though she lives in Portland, Maine. "It's a wonderful place to live if you love outdoor activities," she says. "Summer is great for biking and sailing. And we have excellent skiing out here, both cross country and downhill."

Lemire is a hydrologist for Acadia Environmental Technology. "We provide environmental consulting services to oil companies, industrial clients, government agencies, and municipalities," she says. "The company is small, with three technical staff, but very busy." Despite being busy, though, she makes times for other pursuits.

"I have been fairly active in racing J/24 sailboats, which we take to regattas all over the east coast—all the way to Key West—for some really competitive



J/24 sailboat needs a crew of five so it's easy to find a spot on a crew. "We've done very well."

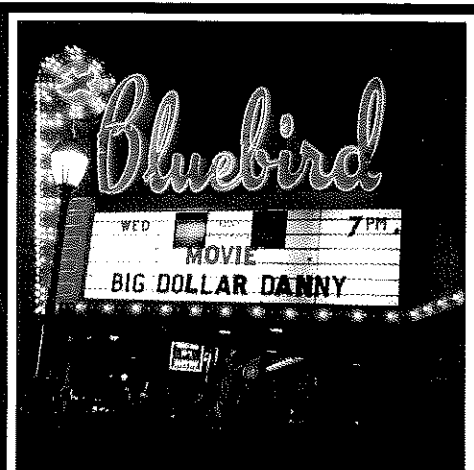
In addition to outdoor activities, which include a new hobby of gardening, Lemire has recently taken up the saxophone. She plays with a concert band, a big band, and a saxophone quartet. "We rehearse more than we perform," she says, but she has appeared at county fairs, street fairs, nursing homes and at the Poland Spring Inn. "It's something I've always wanted to do."

Lemire welcomes word from any of her former classmates. Her e-mail address is ajonesL1@maine.rr.com.

Tang '98 Spends 2 Weeks in a Chinese Jail

Jian Tang PhD Phy '98 spent 14 days in a Chinese jail last November and December after she was arrested for practicing Falun Gong in China. Falun Gong is a spiritual movement that combines slow-motion meditation exercises and Buddhism.

"I just wanted to know the situation of Falun Gong practitioners in China, to share experiences with them," Tang told the *Denver Post*. Chinese authorities cracked down on the sect last April after 10,000 members conducted a peaceful protest. Chinese authorities consider the movement "an evil cult, harmful to people's minds and bodies," according to a story from AP Wire Services. After Tang's arrest, U.S. Sen. Wayne Allard of Colorado intervened asking U.S. officials to help secure her release. She was freed Dec. 10. ■



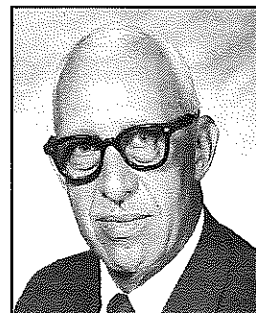
Dan Horan BSc Pet '98 premiered his film "Big Dollar Danny in Delusions of Grandeur" at the Bluebird Theater in Denver Jan. 12. (See "Headliners," November/December 1999 issue.)

racing. Sailing is a huge summer activity here," Lemire says. She and her new husband Gerry don't have their own boat but crew for others. Each

PAUL A. ARCHIBALD

Paul A. Archibald Met E '35, a resident of the Masonic Home in Elizabethtown, N.Y., died May 7 at age 87.

Archibald, originally from Maine, was a veteran serving as a major in the U.S. Army during World War II. After the war, he was chief metallurgist and vice president of Standard Steel, Burnham. Earlier in life he worked at U.S. Steel and Rio Grand Railroad in Denver.



Archibald was a member of East Kishacoquillas Presbyterian Church, Reedsville, N.Y., Lewistown Country Club, Masonic Lodge 160, Middleburg, Elks Lodge No. 663, Lewistown, CSM-MAA Alumni Association and Beta Theta Pi. He is survived by daughters Janice and Carol Crafa, seven grandchildren, nine great-grandchildren and two great-great-grandchildren.

DUANE JOHN FRITZ

Duane John Fritz PE '51, of Durant, Okla., died Oct. 1 at the age of 78.

After graduation from high school in his native Chicago, Fritz joined the Civilian Conservation Corps in 1939 and was stationed in Illinois, Missouri and Nevada.

In 1940, Fritz enlisted in the U.S. Army, and was sent to the Aleutian Islands. During a routine inspection tour for mines, a trap accidentally discharged killing all the members of the crew except for Fritz and the commanding officer. Both were critically wounded and Fritz lost his left eye. He was transferred in an unconscious state to a hospital in Portland, Ore., and remained there several months for recovery.

In 1943, Fritz enrolled in U.S. Army mechanic's school in Glendale, Calif. Upon completion of the training, he was assigned to the Pyote Army Air Base

with a grade of staff-sergeant. While stationed there, he met his future wife, Marcine Moore, whom he married in 1944. At the same time, he was reassigned to the Ardmore Army Air Base and finally Bowman Field, Louisville, Ky., until the end of World War II.

After the war, Fritz worked for McCurdy McElroy on an oil and gas lease in Texas for two years and then enrolled at CSM. After graduation, he was employed by Arkansas Fuel Oil Corp. in Louisiana where he served as chief reservoir engineer. He then went to work for Southern Natural Gas Company as manager of operations in its exploration and production division. In 1970, Fritz retired from Southern Natural and retired as an oil and gas operator in 1989.

Fritz is survived by his widow. The couple had resided in Durant since 1982 where they restored the historic Horace Marshall House which has been deeded in trust to the Durant Historical Society.

RALPH GODFREY

Ralph Godfrey EM '38 died of pancreatic cancer July 3, 1998 at 85.

According to his widow Mary, who was married to him for 53 years, he was "a good man, a good husband, a good father, and a good provider." Godfrey loved his profession, which was mining, and never retired. "He was known to be the best mining engineer in the states and

South America," says Mrs. Godfrey. "He was registered in five states: Colorado, California, Nevada, Arizona and Florida."

Godfrey is survived by his widow, four children, seven grandchildren and six-great grandchildren.

THOMAS ARMSTRONG HARR

Thomas A. Harr EM '36, 84, died Sept. 4 at his home in Evergreen,

Colo. Services were held Sept. 10 at Fort Logan National Cemetery. Harr was born in Billings, Mont., but grew up in Denver and attended school at Park Hill Elementary, Smiley Junior High and East High. At CSM, he was a member of Sigma Alpha Epsilon, Sigma Delta Psi and, after graduation, CSM Alumni Association.

Harr fought in World War II with the Army Corps of Engineers, earning the rank of colonel. He received a Presidential Unit Citation and Legion of Merit in addition to other awards and commendations. He worked for more than 40 years as district engineer and plant manager for Mountain States Telephone Co.

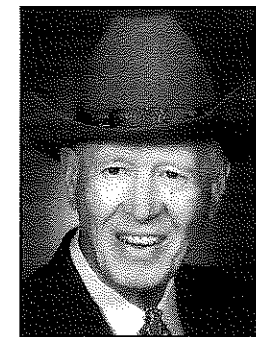
Membership included Colorado and National Engineer Council, Scottish Rite Masonic Lodge, Tennessee Walking Horse Association, Mayflower Society and TelCo Pioneers. His hobbies included horseback riding, fly fishing, bowling, hunting, genealogy, ornithology, traveling, photography and hiking.

Harr is survived by his widow Betty; son Tom; daughters Susan, Sally, Julia and Jayne; stepdaughter Linda; sister Mary Helen; and 13 grandchildren. His first wife Doris Pate, preceded him in death. Memorial contributions may be made to Sudan Interior Ministries (SIM) P.O. Box 7, Rehoboth, NM 87322 (The Thomas A. Harr fund for clean water for Ethiopian villages.)

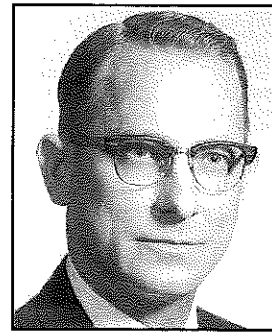
GEURDON E. JACKSON

Guerdon E. Jackson EM '52 died Oct. 11 at the age of 72.

Jackson was an honors graduate from CSM and the University of Arizona. He had a distinguished international career including chief mining engineer for Amoco Minerals. His expertise was



helping mining companies improve their financial and operational planning and reduce capital and operating costs.



Jackson lived in Western Australia and Queensland, Australia but also spent 42 years in Tucson, Ariz. There he acquired the Helvetia-Rosemont deposit for Banner Mining Co.

Jackson is survived by his widow, Maxine, a sister and a brother.

MILTON LEROY LITTLE

Col. Milton L. "Lee" Little died Sept. 30 at his home in Granbury, Texas. He was 67.

Although Little never graduated from CSM, he attended off and on from 1950 to 1955. According to his twin, Thomas Wilson Little PE '54, "One of the valuable things he took from Mines was a completed senior ROTC program."

After attending CSM, Little graduated with an earth science degree from Texas Christian University and a master's degree in personnel management from George Washington University. He attended the Command and General Staff College in 1970, the Armed Forces Staff College in 1976 and the Army War College in 1977.

Little served in the U. S. Army for 25 years and had two tours in Vietnam. He was Army Corps of Engineers district engineer during the construction of the Corps most expensive-to-date project—a \$25 billion fort, KKMC. He retired in 1981 as a highly decorated full colonel.

Following military service, Little joined the Arabian American Oil Company. He lived in Saudia Arabia and Indonesia. While overseas, he was an avid missionary and committed to numerous charities. During Desert Storm, Little "donated all his personal effort and resource on a one-on-one basis, like

storied care givers of old—YMCA, USO, Red Cross—to sustain and comfort our troops," says his brother.

THOMAS A. MANHART

Thomas A. Manhart Geol E '30, MSc Geop '32, Medalist '61, Mines Medal '84, Hon Mem '83, a pioneer geophysicist and oilman, died Nov. 20 at 91.

Manhart's career spanned the birth and development of the seismograph industry. He began his career with Shell Oil Co. and later joined Seismograph Service Corp. where, through the 1930s and World War II, he served in various capacities including executive vice president and chief of operations.

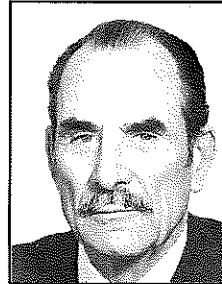
After World War II, Manhart was an active independent exploring for oil and gas in the mid-continent area. He formed the oil and gas exploration venture of Manhart, Millison and Beebe.

Manhart then joined Century Geophysical Corp., an early major seismograph contracting company and builder of seismic equipment. While at Century, he participated in the development of the first uranium exploration effort, formed Seismic Reference and organized Data Inc., a weekly oil-well scouting service. In 1974, he founded International Society of Energy Advocates, a group of independent oil and gas men who would have a major impact on oil and gas policy following the 1973 Arab oil embargo.

Manhart was a lifetime member of the Alumni Association, class agent and a guiding force when Mines Annual Fund first started. He is survived by his widow, Virginia, two daughters and seven grandchildren.

ALLAN P. NESBITT JR.

Allan Preston Nesbitt EM '38, a lifetime member of the Alumni Association,



died Nov. 28 at age 83, after a short battle with lung cancer.

Nesbitt was raised in Casper, Wyo., and was of Scotch-Irish descent. He worked his way through CSM. His first job after graduation was with El Teniente Copper Mine in Chile. He married Ada May Cox of Denver and took her with him back to Chile.

Nesbitt returned to the United States in 1941 and took a commission with the war-time Army. While in the Army he lived in five different countries and traveled in 32 others. From 1954 to 1958 he was professor of military science and tactics at Colorado School of Mines. His last post was in Seattle where he retired as a lieutenant colonel after 30 years of service.

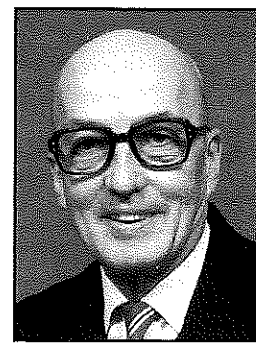
After retirement, Nesbitt worked as a contract administrator for King County Highway Commission for seven years. He was a member of Magnolia Presbyterian Church and did volunteer carpentry, janitorial and office work. During his retirement he enjoyed corresponding with his classmates. He and his wife were host and hostess for the 40th, 50th and 60th class reunions. He also enjoyed writing, traveling, gardening, Kiwanis and investments.

Nesbitt is survived by his wife of 60 years Ada, daughter Nancy Gibson, son Allan, five grandchildren and five great-grandchildren. In lieu of flowers, the family requests a contribution to a charity of your choice or CSM.

LOUIS B. PARKS

Louis B. Parks PRE '48 of Clarksville, Ga., died May 9 at his home at age 75.

Parks was a Navy veteran of World War II. While at Mines, the Denver native played basketball and football and was a member of Alpha Tau Omega, Blue Key and Theta Tau. He attended



his 50th reunion in 1998.

Parks is survived by his widow Christine, daughters Susan Louise Ransdell and Anne Christine Parks, son David B., a brother Howard E. and five grandchildren.

CLIFTON C. SAMMONS

Clifton C. Sammons Geol E '58, of Quartz Hill, Calif., died Aug. 14. He was a senior safety engineer for the State of California, DOSH Mining and Tunnel Unit. He also was an active member of the Alumni Association.

FRANK EDWARD WOODARD

Frank Edward Woodard Met E '42, a long-time resident of Grand Junction, Colo., and an active member of the Alumni Association, died Dec. 11 after a lengthy illness. He was 80.



After graduation from Mines, Woodard worked for Allis Chalmers in the metallurgical laboratory until 1944, when he joined the U. S. Army's Signal Company 30th Divison (Old Hickory). He served in the European theater, then returned to the States where his division then prepared for an invasion of Japan. "Mr. Truman saved my life and many millions of other GIs' by dropping the bomb on Hiroshima and Nagasaki," Woodard commented many times.

After the war, Woodard was a miner in Ouray, Telluride and Whitepine, Colo. In 1948 he moved to Beaver Mesa, Colo. to mine uranium and vanadium and continued to operate uranium mines until 1986.

Woodard was active in the Ute Chapter of Professional Engineers of Colorado and was a member of the Moose Lodge, Elks Lodge, Grand Junction Geological Society, Mining and Petroleum Club, the Society of Mining Engineers, Mining Hall of Fame (Lead-

ville, Colo.) Rocky Mountain Coal Mining Association, RAMS, Western Small Miners Association and the Uncompahgre Plateau Paleontological Society.

In the years since he retired, he traveled widely visiting mining operations in Chile, Wales, the Phillipines, Spain, Canada and Trinidad. He was married to Ruth Ray in 1958. She died in 1981.

Woodard is survived by long-time companion Mary Ann Bradshaw, son James Ray and three granddaughters. In lieu of flowers, the family suggests donations be made to Soup Kitchen, P. O. Box 246, Grand Junction, CO 81502.

GEORGE W. WUNDER

George W. Wunder EM '36 Medalist '74, of Port Washington, N. Y., died of cancer Nov. 1 at age 86.



At Mines, Wunder was active in professional and social organizations, a member of Blue Key, Sigma Gamma Epsilon, Scabbard and Blade, captain of the wrestling team and president of Beta Theta Pi.

Upon graduation, Wunder began his mining career with the U. S. Smelting, Refining and Mining Company at its Bingham Canyon operations. He was called to active duty with the U. S. Army Corps of Engineers in 1941 and rose to the rank of lieutenant colonel, commanding engineer aviation battalions in New Caledonia, New Hebrides, Guadalcanal and

Okinawa. After 56 months of active duty he was discharged and he returned to U. S. Smelting as superintendent of a four-mine complex at Eureka, Utah.

In 1948, Wunder began an 18-year career with the National Lead Company. He became a key executive with duties encompassing the nuclear metals division, Nickel Processing Corporation and the construction of the first magnesium extraction plant, built on the western shore of the Great Salt Lake, Utah, to extract magnesium and other by-products from salt water. Wunder then joined the New Jersey Zinc Company in 1967 as executive vice president with responsibility for all company operations. He then moved to The Anaconda Company where he was vice president and director of technology advising the vice chairman and division presidents on Anaconda's projects and operations in the United States, Chile, Indonesia, Iran, Mexico and Poland. Wunder retired in 1976.

In retirement, he pursued his passion for the outdoors. He was president of the Port Washington Sportsman Club and an active member of the Manhasset Bay Yacht Club. He continued his hunting and fishing activities throughout the United States until summer of 1999.

Wunder reached the pinnacle of success in life by achieving the respect and admiration of all those with whom he associated. He was a loving husband and father and totally dedicated to his family and to the School of Mines, both of which he believed made his successes possible. He is survived by his widow Frances, three children, four grandchildren and two great grandchildren. ■

Also in Memoriam

James E. Cole EM '35	1999
Michael C. Dengler BSc Pet '85	March 13, 1999
Frank E. Hayward PE '32	Unknown
Herbert B. Heggland PE '35	July 1998
Walter J. Hillabrant EM '42	May 23, 1999
Stanley T. Serocki Geol E '55	Sept. 9, 1999
Harvey W. Smith EM '49	Aug. 20, 1999
George D. Wilkinson Met E '53	May 16, 1999

The Colorado School of Mines Alumni Association has sections and contacts throughout the world. They are involved in various activities that include social and athletic events, student recruitment, scholarship, and university and community service.

All alumni are welcome to join in the action. Call (800) 446-9488, ext. 3959 for more information.

Central Region

St. Louis, Mo.

Terry Laverty EM '70 organized a Sunday afternoon get together for the revitalized St. Louis section. The group met in the bar of the Marriott Pavilion in downtown St. Louis. Remembrances were shared and stories were told. Michael Watson, CSMAA executive director, was on hand to update members on school activities. Several of those present volunteered to serve as high school student recruiters.

Roger Phillips Geol E '63 has offered to help Laverty organize the next event.



Standing from left, Mokhtar M. Hamada MSc PRE '63, DSc PRE '65, Marcia Imrie, Jim Imrie Met E '63, Bill Brown, BSc CPR '79, MSc Min Ec '80, Joe McKee PE 59, Maria Leathrum BSc Met '97 and Pat Leathrum. Back row seated, from left, Bobbie Aden BSc Met '78, Michael Watson and Roger Phillips Geol E '63. Front row seated, from left, Frank Hotter Geol E '59, Terry Laverty EM '70 and Phil Glynn BSc Met '86.

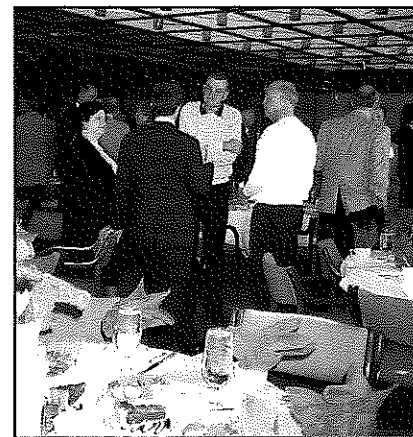
Metro Denver Region

Dr. John Trefny, CSM vice president for academic affairs and dean of faculty, discussed the current status and future plans for buildings and curriculum at the September quarterly meeting at the Metropolitan Club. In attendance were Dick Beach Geol E '66, Ed Crabtree EM '60, Bill Zisch BSc Min '79, Michael Watson, Bob Pearson PE '59, Cathy Cutrell BSc Geol '75, Bill Engel Met E '60, Mines Medal '94, John Ferrill MSc Env Sc '83, Jack Haley PE '48, Glen Jameson MSc Env Sc '95, Kevin Kidd BSc Min '98, Lee Mathews PE '48, Paul Mathias PE '63, Jim Mulryan EM '54, Charles McNeil BSc Min '71, Medalist 98, John Pfuitze BSc CPR '71, Lou Phannenstiel PRE '54, John Schwartzberg BSc Met '88 and Doug Ward BSc Pet '74.

Nineteen petroleum engineering graduates and guests attended a luncheon at the Petroleum Club Jan. 27. Craig Van Kirk PhD Pet '72, CSM petroleum engineering head talked about his department and its activities. The event was hosted by Barb Ganong BSc Pet '82 and Alan Mencin BSc CPR '79.

Soccer Match Planned

An alumni/ varsity soccer match is set for 2 p. m., Saturday, April 1 at CSM's Brooks Field. Bob Pearson is organiz-



More than 80 Denver-area alumni gathered in December for the annual holiday party. This year's event was held at the Petroleum Club, known for its spectacular views of the city.

ing a team of recent graduates to challenge Frank Kohlenstein's spring squad. A picnic or party is planned after the match. All Denver-area alumni are welcome. Pearson has contacted ex-players. If you didn't get invited and would like to play, call him at (303) - 273-3959.

Luncheon with Speaker Coming Up

Jim Gusek BSc Min '73 will discuss "The Straight Poop on Passive Treatment of Acid Rock Drainage" 11:30 a. m., March 16 at the Metropolitan Club, 7800 E. Orchard. Cost of the luncheon is \$20. Call (303) 273-3295 for reservations.

Rocky Mountain Region

Colorado Springs

Forty-one alumni, parents and players shared a buffet between the women's and men's basketball games when Mines played at University of Colorado- Colorado Springs Jan. 14. The buffet was in the library next to the gym. It was hosted by Kenji Farenelli BSc Geop '74, Colorado Springs section coordinator.

The women won their game 64-47; the men lost 75-70.



Pueblo



From left, Don Starbuck BSc Phy '74, Chuck Leaf PE '52 (back), Susan Gifford, Ed Cutrell Met E '54 and Jeanne Cutrell at the basketball game in Pueblo. Forty-five people associated with Mines attended. Buffet was between games in a classroom above the gym.

Greeley

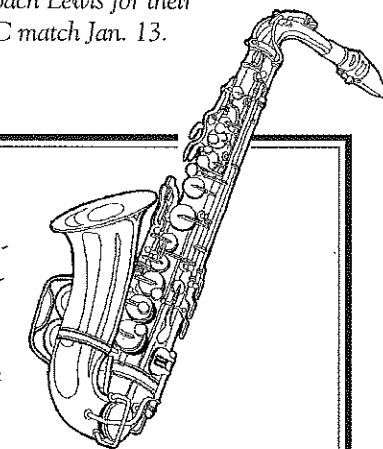


From left, Mines juniors Matt Chase, Jody Trantham and Nate Mascarenas are congratulated by Coach Lewis for their wins in the UNC match Jan. 13.

Calling All Musicians and Singers!

With nearly 5,000 CSM alumni living within the Denver metropolitan area, it has been proposed that a group be organized to participate in next year's homecoming parade. If enough people are interested, a marching band could be assembled that gets together occasionally to practice. The band could then march in the parade and if members were interested, perform at other events. In addition, if enough singers are interested, a chorus or quartet or other group could be formed. During Homecoming, that group could ride on the float the CSMAA plans to design and build for this fall's event.

If you are interested in either endeavor—whether as a potential leader, organizer, or as a participant—please contact Bob Pearson at (303) 273-3959 or rpearson@mines.edu.



Meet Students, Promote CSM, Have Fun!

By Mary Pott BSc CPR '83

Assistant Director of Admissions and Coordinator of Alumni Recruiting

Do you remember why you decided to attend the Colorado School of Mines? Do you remember why you stayed to graduate? Would you like to talk to high school students about your decisions, experiences and career? If so, consider participating in the Alumni Admissions Representative (AAR) program.

Throughout its history, Mines alumni have encouraged outstanding young men and women to consider their alma mater. Your participation in the AAR program helps the school reach students the admissions office can't afford to contact in person. You can help by:

- attending college fairs in your area;
- receiving calls from prospective students when they want to talk with someone locally;
- calling accepted students and inviting them to attend a program on campus;
- presenting scholarship awards at high school awards assemblies on behalf of Mines; and,
- hosting a send-off reception for enrolling freshmen from your area.

Last fall, alumni represented Mines at 28 college fairs in Texas, California and Alaska and have contacted more than 500 students to date. Here are examples of what alumni had to say about their experiences:

"It was splendid! We were busy most of the night with many interested people. Sometimes we had two or three people stacked up and ready to speak with us. This was definitely a success! I hope we get the opportunity to do this college fair again next year."

Roxann MacKenzie Hayes, EG '95, Houston, Texas

"I had a lot of traffic, much more than I expected. Not many people had heard of the school, but they were often attracted by the location. Those who were interested in engineering stayed to talk and get information. I think it was worth doing, and I'd be happy to do it again."

Dan Krygowski MSc Geop '75, PhD Geop '78, Austin, Texas

"It was fun and went really smoothly! We had 93 contact cards turned in. I know that the alumni made a positive impact in the lives of the local kids who stopped to talk."

Tom Walker, PE '89, Anchorage, Alaska

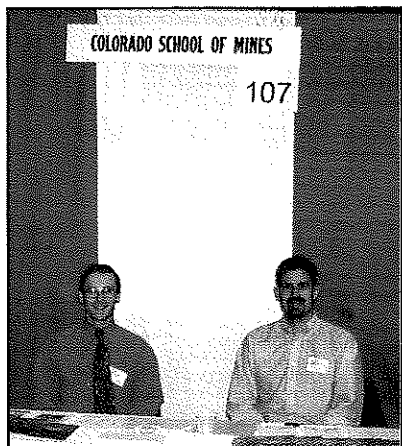
The college admissions process has become more complicated for high school seniors. Outstanding students are actively recruited by many top-notch schools and the schools that are chosen are the ones that can provide the best education for the money. The best information the students can get is to hear how Mines alumni have succeeded in a variety of careers. Even better is when they can hear it from the source.

We'd like to increase our representation in other areas of the country. We feel that through personal contact, we can increase the number of out-of-state students who decide to enroll. If you attended Mines as a non-resident, you understand how important that contact is when students make their college decision.

All our alumni representatives receive the latest material from the admissions office including view books, applications, catalogs, brochures, information sheets, etc., so that they are well prepared to talk to students. If you decide to participate, you will receive the *Alumni Admissions Representative Handbook* to help you in your efforts. Also, you will be notified of training programs in your area and of new developments on campus.

Many alumni have told me this program gives them a wonderful opportunity to give back to the school. This is especially true for young alumni who don't have the financial resources to give but want to contribute in some way.

If you have any questions, please call me at (303) 273-3291 directly or toll-free at (800) 446-9488, ext. 3291, 8 a. m. - 5 p. m. MST, or e-mail me at mpott@mines.edu.



Mike Niznik (left) and Tom Walker greeted students at a high school fair in Anchorage, Alaska last fall.

CSMAA Local Section Interest Survey

In an effort to better serve you, we need to hear from you!

Name: _____ Mines Degree/Degrees: _____

Address: _____

Phone: (H) _____ (B) _____

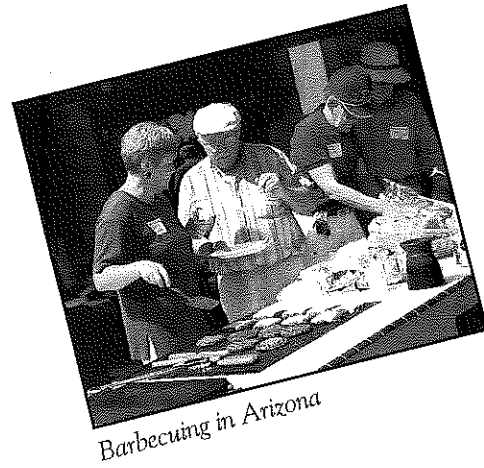
E-Mail: (H) _____ (B) _____

Please indicate your potential interest in attending CSMAA local section activities by circling a value from 1 to 5 where 1 indicates *no interest* and 5 indicates *very strong interest*.

	no interest		very strong interest		
	1	2	3	4	5
I would like to start a local section of the CSMAA in my area:	1	2	3	4	5
I would attend monthly/bimonthly/quarterly lunches:	1	2	3	4	5
I would like to help organize the lunches:	1	2	3	4	5
I would participate in CSMAA golf tournaments:	1	2	3	4	5
I would attend CSM athletic events in my area as an alumni group:	1	2	3	4	5
I would attend dinner meetings with a speaker:	1	2	3	4	5
I would participate in family weekend functions (picnics, ski trips, tours, etc.):	1	2	3	4	5
I would purchase tickets to plays, concerts, and attractions as an alumni group:	1	2	3	4	5
I would participate in recruitment of high school students (college fairs, contacts):	1	2	3	4	5

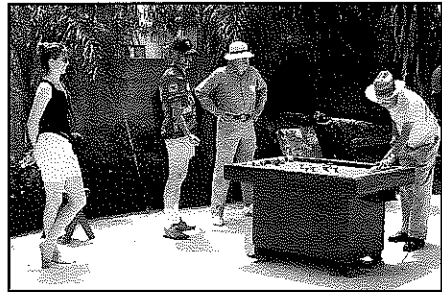
Other suggestions or comments?

Detach this page, fold in thirds and use reverse side to mail survey.

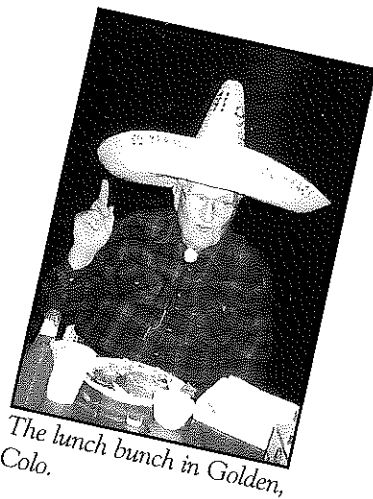


Barbecuing in Arizona

JOIN THE FUN!



Alumni Olympics in Arizona



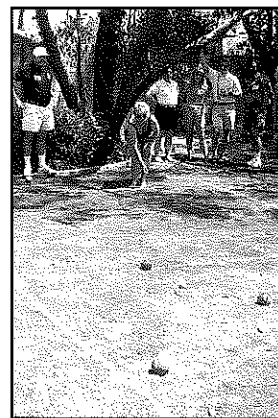
The lunch bunch in Golden, Colo.

PLACE
POSTAGE
HERE

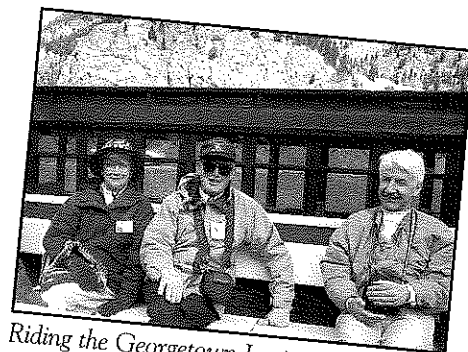
Bob Pearson
CSMAA
P.O. Box 1410
Golden, CO 80402



Bicycle races



Alumni Olympics



Riding the Georgetown Loop

CSMAA Contributors 1998-1999

The Colorado School of Mines Alumni Association thanks the following individuals who, in addition to paying their annual membership dues, made contribution 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.

- | | | | | |
|-----------------------------|-----------------------------|-------------------------------|------------------------------|--------------------------------|
| William A. Abbott '68 | Michael J. Belt '89 | James W. Calvin '71 | Charles R. Cutler '39 | Frank Erisman '65 |
| Joseph M. Abell '56 | Arden L. Bement, Jr. '54 | Charles W. Campbell '47 | Richard A. Daniele '60 | Marc D. Ernest '74 |
| Robert Abercrombie '54 | Einar T. Benson '33 | Harry D. Campbell '42 | James R. Daniels '51 | Lynn D. Ervin '40 |
| H. Don Adams '52 | John H. Benton '78 | Christopher R. Candee '69 | Zora V. Dash '74 | Hugh W. Evans '49 |
| Robert B. Affleck '85 | Ted R. Bergstrom '54 | T. Vincent Canning '32 | Jeffrey D. Davidson '79 | Richard J. Evans '63 |
| Roberto Aguilera '71 | Gerald W. Berk '62 | John W. Carey '51 | Edgar W. Davis, Jr. [D] '52 | Ronald E. Evenson '57 |
| Charles M. Albrecht '67 | Gerald L. Berry, Jr. '86 | Dale C. Carlson, Jr. '93 | Nathan O. Davis '97 | Bengt G. Fagerberg '47 |
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| George S. Ansell '85 | George C. Bodine, Jr. '48 | David A. Chasis '61 | Samuel J. Dennis '84 | William G. Fischer '56 |
| John W. Anthony '85 | Paul A. Bollheimer '51 | Charles E. Christman, [D] '49 | Michael R. DeSilva '65 | Joseph F. Fisher '61 |
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| David W. Ashcom '77 | Toni A. Bowden '95 | Martino E. Clavi '96 | W. Leon Dotson '53 | Michelle M. Foss '85 |
| Herbert J. Ashe '49 | James L. Bowen '43 | John D. Closs '50 | Ralph H. Dougherty '56 | L. Luke Fournier '50 |
| James S. Ault '52 | Robert F. Bowie '42 | Charles L. Clugston '65 | Peter A. Drobeck '79 | John F. Fox '52 |
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| Russell Badgett, Jr. '40 | Liselotte F. Bradford '86 | Roger Cohen '83 | Beverly C. Duer '53 | Raymond B. Franklin '49 |
| Chae Hwan Bae '90 | John S. Bradley '48 | David R. Cole '52 | Frederick F. Dueser '49 | William H. Fraser, Jr. '49 |
| Andrew L. Baker '89 | Ralph L. Bradley '47 | Dwayne M. Coleman '49 | George A. Dunham '59 | Wilbur S. Frederick '56 |
| Leanne M. Baker '81 | J. Larry Breckenridge '97 | Robert B. Coleman '49 | Harold P. Dunn '53 | Jamie E. Frisch '98 |
| Alfred H. Balch '64 | Donald L. Bröhm '52 | Eileen E. Colleary '78 | Jack D. Duren '48 | Duane J. Fritz, [D] '51 |
| Roger C. Banghart '57 | Alex A. Briber '48 | William M. Colleary '77 | Arthur J. Dyson '51 | Robert L. Froemke '43 |
| Richard B. Banks '53 | Arthur R. Briggs '57 | Daniel G. Collins '83 | Lawrence G. Eagan '65 | Brian R. Frost '78 |
| T. Jay Barbour '47 | Tyler Brinker '50 | E. L. Colthurst '52 | R. Charles Earlougher '36 | Weldon G. Frost '52 |
| W. Bruce Barbour '37 | Edward H. Brinley '49 | Kelth G. Comstock '50 | Frederick H. Earnest '87 | Carol V. Fuchs '74 |
| Robert B. Barker '58 | Jason D. Brockel '90 | L. Stevens Conder '51 | Bruce J. Eberhard '57 | Kenneth P. Fuchs '74 |
| John H. Barney '57 | Warren M. Broman, Jr. '66 | Harry M. Conger III '55 | Robert R. Edison '49 | Esther M. Fueg '96 |
| Geoffrey P. Barrett '95 | Albert H. Brookes '36 | Courtney E. Cook '49 | Sheldon T. Edwards '77 | James E. Fueg '96 |
| Bruce O. Barthel '56 | Darren L. Brown '84 | William H. Cooke '53 | Harry W. Egdorf, Jr. '75 | Thomas R. Fulton '53 |
| William P. Bartow '73 | Floyd L. Brown '43 | David F. Coolbaugh '43 | Richard B. Egen '60 | Joseph L. Fusselman '42 |
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| Tricia M. Bauer '97 | Gordon W. Bruchner '58 | John T. Corson '58 | Rodney J. Eichler '71 | Barbara L. Ganong '82 |
| William F. Baumann '54 | Paul M. Brunner '76 | Jeffrey R. Corwith '80 | Robert L. Elder '58 | Richard A. Ganong '47 |
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| Robert T. Beckman '57 | Bryan J. Burinda '94 | Sophie T. Cramer '98 | Harry A. Ellis, Jr. '54 | Phil H. Garrison '39 |
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W. Dennis Gibson '76
Mary Jo Giddings '88
John D. Gillespie '65
Marco V. Ginatta '71
Michael J. Glade '77
Jennifer R. Glennon '96
Jack V. Glinkman '54
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Daniel S. Gralla '85
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James L. Green '73
Robert E. Green '60
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Rodger D. Greer '83
Dennis E. Gregg '50
Bob Greider '43
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Fred J. Gruberth '55
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Richard W. Haley '56
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Jon F. Hamlin '58
Duncan L. Hammon '77
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Jack C. Haptonstall '60
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The History and Significance of Agricola's *De Re Metallica*

By Robert Sorgenfrei

At each commencement ceremony, a copy of *De Re Metallica* is carried by the president of the faculty senate in the procession. It is carried as a symbol of the academic enterprise at Mines. Why is a book originally published in Latin in 1556 considered so important more than 400 years later? What gives this book its enduring value and place in scientific literature? To answer these questions, we must go back and examine the life of its author, Georg Bauer, better known by his Latin name, Agricola.

Agricola was born in 1494 in Glauchau, Germany, 40 years after Johann Gutenberg published the first book with movable type and two years after Christopher Columbus discovered the existence of the New World. The Renaissance was in full swing and the Age of Discovery had started. Agricola was a true son of the Renaissance. He graduated from the University of Leipzig and was well versed in the Greek and Latin classics being printed in book form for the first time. He was interested in science and became a physician. In 1526, Agricola was appointed physician to the town of Joachimsthal (now Jachymov in the Czech Republic). This region of Europe is rich in ore deposits and to this day remains an area of metal mining. Agricola became fascinated with mining and spent most of his free time observing local mining operations, asking questions and studying the few books on the subject.

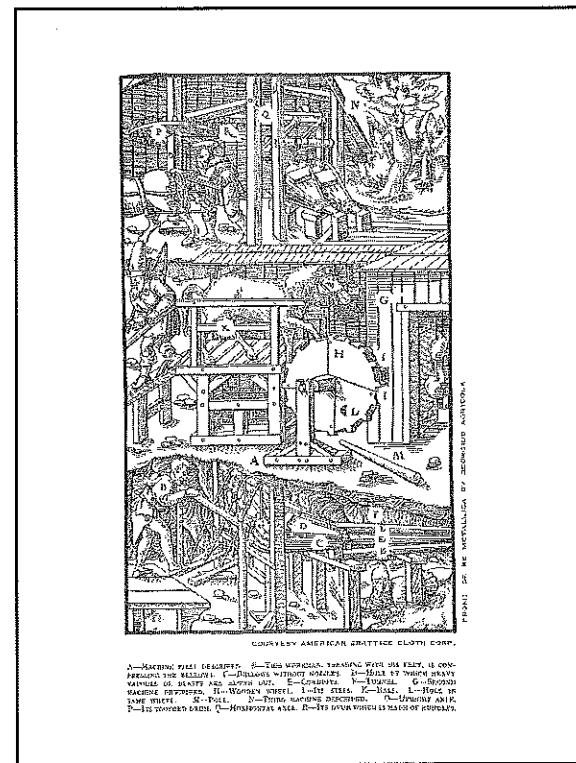
In 1539, he began writing *De Re Metallica*, or *On Metals* as the Latin title would translate into English. The book encompasses virtually everything there is to do with the mining industry. It is divided into 12 books or chapters. Sections discuss mining methods, metallurgical processes, mine investment, mine administration, mining law, diseases of miners and the effects of mining on the environment. The text is greatly en-

hanced by a series of 273 magnificent woodcut illustrations by Hans Rudolf Deutsch. The woodcuts show in great detail the technology used in ore haulage, use of water power, pumps, ventilation techniques in mines and metallurgical methods.

Agricola also made a contribution to physical geology by describing his observations of how wind and water help determine landscapes. He was far ahead of his time using geological observations in a dispassionate, objective manner. Unlike some of his contemporaries, he did not delve into alchemy and attribute magical properties to minerals. He was not only a great Renaissance scholar, but a true scientist, composing one of the first masterpieces of technical writing.

De Re Metallica was completed in 1550, but was not published until a year after Agricola's death in 1556 because it took a great deal of time to finish the woodcut illustrations. The book remained the definitive book on mining and metallurgy well into the 18th century. It is still perhaps one of the best works describing pick-and-shovel mining operations that technological advances in the 19th century finally supplanted.

Four editions of *De Re Metallica* were published in Latin (1556, 1561, 1621 and 1657). German editions were published in 1557, 1580 and 1621. An Italian edition was published in 1563. It was not until 1912 that the first English edition was published. In that year, mining engineer and later President Herbert Hoover and his wife Lou published their translation in London. It re-



A page from *De Re Metallica* shows a drawing that illustrates three machines used in mining that are described in the text.

mains in print to this day in a softcover edition published by Dover Publications.

The closest place to see copies of *De Re Metallica* is in the Russell L. and Lyn Wood Mining History Archive in the library on campus. The archive has an original first edition as well as the third and fourth Latin editions. The archive also contains copies of the Hoover edition and its later trade editions. The first edition is amazingly well preserved as the paper it was printed on is high quality cotton rag with virtually no acidic impurities. The paper in the first edition looks fresher than the paper in many books published centuries later. The original first edition as well as the other editions can be seen in the archive any afternoon Monday through Friday.

Robert Sorgenfrei is librarian/archivist of the Russell L. & Lyn Wood Mining History Archive, Arthur Lakes Library. ■



John McLaughlin, right, talks to children about being an engineer.

John McLaughlin Heads to Austria for a Semester Abroad

Third-year petroleum engineering student John McLaughlin is looking forward to spending spring semester in Austria studying resource engineering and learning to speak German. He already reads French well and will study German for two hours a day during his stay. His future dream job, however, will be with an oil company in South America or Southeast Asia.

McLaughlin, a native of Iowa, attended boarding school in Connecticut, but wanted to head west for college. "I wanted to go somewhere where I had to work hard," he says. "The professors I spoke to here [before deciding] were very high caliber."

Once here, McLaughlin wasted no time becoming actively involved on campus. He was a member of a student-faculty group proposing improvements to the school's honor code. He was class president his freshman and sophomore years. He was editor of the *Oredigger* last spring and fall semesters. And he was student liaison for the Alumni Association board of directors.

Even before he started college, McLaughlin planned to become an engineer. While still in high school, he began working for Weitz Construction Co. in Iowa. He later was a con-

struction engineer for Weitz Construction's branch office in Denver and worked on the AT&T and TCI corporate headquarters in the Denver Tech Center. His original career goal was to be a civil engineer, but working on the Tech Center projects changed his mind. "It was the pinnacle of innovation in construction engineering," he says. "But it wasn't as exciting a job as I was looking for. There's not that much creativity involved." Now McLaughlin is contemplating a career as a reservoir engineer. Last summer he worked for Phillips 66 in Odessa, Texas as the reservoir engineer on a team with a geologist and geophysicist. He studied well completion methods, worked on the economics of drilling, completing/stimulating, and producing the same gas plays and also did oil prospecting. "I just received an e-mail from my old boss that one of the old well bores I was looking at recompleting turned out to have five producing zones and the well will pay for itself in five days!" he says.

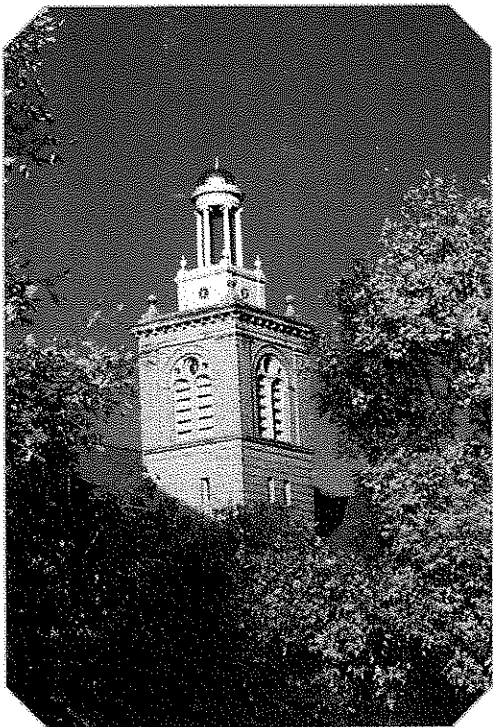
In addition to academics, McLaughlin is also an avid skier and mountain biker. In high school he ran track and holds two school records. He also plays piano, cello and trumpet. ■

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