Networking Pays Off

I would like to thank you for printing the alumni directory (Network 2002). During my recent job hunt I decided to look for job opportunities in the directory and wound up being hired by another Mines graduate!

Vanessa Davies-Pappas BSc Math & Comp Sci '99, MSc Math & Comp Sci '01

[Editor’s note: Active members of CSMAA can view the directory online. The online version is updated constantly throughout the year.]

More on Mines’ Military History

As a former professor of Military Science at Mines, I read Lorraine Wagenbach’s article “The Glory Years of ROTC” (Mines, Fall 2002) with a bit of disappointment for it said nothing about Army ROTC in later years. For example, in 1983 and 1984 Mines led the nation in the number of students who won Army ROTC scholarships! But this wasn’t an easy accomplishment.

Although Ms. Wagenbach proudly pointed out that in 1971 Mines commissioned 64 engineers as second lieutenants, the nadir of the program followed just nine years later when enrollment in the advanced course fell off drastically, and the Mines Army ROTC program was placed on probation and faced extinction. The reasons for this are many: the anti-war backlash of the Vietnam War, the “national malaise” pointed out by President Carter, and the Department of the Army decision to discontinue “Branch Material” programs like Mines’, which guaranteed Mines students commissions in the Army Corps of Engineers.

It was only through hard work and the support of many Mines faculty members and former cadets that the Mines cadre, led by an energetic enrollment officer named Maj. (later lieutenant colonel) Bruce Greitz, was able to turn the tide, and Mines led the nation (in Army ROTC) once again in 1983 and 1984. Since then, Mines graduates have served with distinction in Operations Desert Storm, Enduring Freedom, Bosnia, Kosovo, and I am sure Iraqi Freedom!

Rick Anderschat
Colonel, U.S. Army Corps of Engineers, Retired
Professor of Military Science, 1983-1985
Government Policymakers Go to the Source
Energy and Minerals Field Institute provides on-site lessons about energy resources

Engineer Shows Passion for Wildlife and the Environment
Newlin ’96 is a scientist and a nature photographer

About Our Cover:
The Ponnequin Wind Farm, located south of Cheyenne, Wyo., near the Colorado-Wyoming border, provides the first commercially produced electricity from wind power in Colorado. The wind farm was one of many sites visited last summer by participants in CSM’s Energy and Minerals Field Institute. Photo courtesy of Xcel Energy, Denver, Colo.

Mines – A Leader in Energy
CSM is uniquely qualified to play a prominent role in energy issues

New Geology Museum Dazzles, Delights
Geology museum moves to new home in General Research Laboratory

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New Geology Museum Dazzles, Delights

By Marsha Konegni

The main floor of the two-story museum, located in the new General Research Laboratory at 1310 Maple Street, is a beautiful showcase; the lower level is a hands-on, educational environment for children who tour the museum.

Gold from the Smuggler Union Mine, Telluride, Colo.

Calcite from the Elmwood Mine, Carthage, Tenn., on loan from Martin Zinn

Azurite with malachite, donated by Bruce Oreck

Malachite with azurite from the Copper Queen Mine, Cochise County, Ariz.

Calcite with azurite from the Elsmoo Mine, Carthage, Tenn.

The official ribbon-cutting by Dr. and Mrs. John U. Trefny

Bryan Lees BSc Geol '85 and Kathryn Lees BSc Math '88 beside the world's best collection of rhodochrosite specimens, which they have loaned to the museum; the rhodochrosite, Colorado's state mineral, is from the Sweet Home Mine in Colorado.

Calcite from the Steinwood Mine, Carthage, Tenn., on loan from Martin Zinn

Paul Bartos, left, and Martin Zinn, who has donated an entire special exhibit of Tennessee minerals to the museum

Dave Bunk, former Mines student, with his special exhibit of rhodochrosite from the Sunnybloss Mine in Colorado

Former CSM President Guy T. McBride Jr., examining a recent donation to the new museum

Museum Director and Curator Paul Bartos, left, and Vice President of Academic Affairs Nigel Middleton, right, with Bruce Oreck, who has donated mineral specimens worth $1 million to the museum, including this clear quartz crystal surrounded by white and tourmaline from the Pederneiras Mine in Brazil

By Marsha Konegni

Azurite with malachite, donated by Bruce Oreck

Malachite with azurite from the Copper Queen Mine, Cochise County, Ariz.

Gold from the Smuggler Union Mine, Telluride, Colo.
Under Secretary of Energy Visits Mines

Robert G. Card, the U.S. Department of Energy’s Under Secretary of Energy, visited Mines in July to become better acquainted with the School’s energy research program. He met with Vice President of Academic Affairs Nigel Middleton, as well as John Curtis, John Fanchi, David Olson and Tony Dean. The meeting focused primarily on natural gas potentials in the Rocky Mountain region, with supplementary discussion on oil and gas production, nuclear energy and surrogate nuclear materials, and fuel cell technologies.

MicroPhage Inc.

MicroPhage Inc. has won “The Next Great Idea: TiE-Rockies’ Search for Tomorrow’s Technology Business,” a region-wide competition to identify and help develop the best new technology business concepts in the Rocky Mountains. All submitted business plans were evaluated by leading Colorado business executives and venture capitalists.

Mooney Honored

Dr. Michael Mooney, associate professor in the Division of Engineering, has received the 2003 Arthur Casagrande Professional Development Award from the American Society of Civil Engineers. The award recognizes outstanding accomplishments as evidenced by completed works, reports or papers in the field of geotechnical engineering. Mooney was honored for his contributions to geotechnical health monitoring, intelligent geosystems and geotechnical education.

Mines’ Newest Building

The General Research Laboratory (GRL), Mines’ newest building, celebrated its opening with a reception in September. Building occupants include the Center for Commercial Applications of Combustion in Space, the Geology Museum and the Ultraviolet Optical Science Laboratory. GRL is located at 1330 Maple Street.

Mines Medals to High School Juniors

A reception for Colorado high school juniors who won Mines Medals this year was held June 8. The students were chosen as the best in their schools in science and mathematics. The awards, a joint program of the CSM Alumni Association and the Office of Financial Aid, include a $1,000 scholarship for students who attend Mines.

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Larner Awarded Medal

The Russian Academy of Natural Sciences will present its highest award, the Piotr L. Kapitsa Gold Medal, to Larner. Larner was among 14 winners of the annual award. The Russian Academy named him for his contributions to geophysics. The award was presented at the Academy’s annual meeting at Moscow State University in September.

Selected graduates will enter a technical career intern program with government commitments to:
- provide extensive training in fossil energy technologies
- pay up to $40,000 of student loans
- pay for a master’s degree in earth sciences or engineering from one of the pipeline educational institutions, while working part-time and receiving full salary
- provide other standard benefits of employment with the federal government.

After an initial pilot program implementation period of up to 36 months, the program is expected to expand to include more colleges and universities ranked as superior in the engineering and earth sciences disciplines.

CSM Discoveries Hailed by Physics Today

Of four noteworthy physics discoveries highlighted in the August 2003 issue of Physics Today, two originate from the CSM Physics Department.

One is the all-optical histology with femtosecond lasers, a technique for cutting and imaging brain tissue. Mines Professor Jeffrey Squier BSc, Phy ’84, Ms, Phy ’86 is one of the researchers on the multidisciplinary, multi-institutional team that has developed the technique.

The other discovery is energy-filtered scanning tunneling microscopy. This novel technique extends the concept of a color filter, long used to enhance contrast in optical microscopes, to imaging at the atomic scale. The team of Mines researchers around Physics Associate Professor Peter Sutter, which developed the technique, foresees far-reaching applications in nanotechnology.

Unique Poster a Winner

A Mines poster entry won first prize in the category “Unique, Unusual, and New Techniques” at the 2003 International Metallographic Contest in San Antonio in August.

Fredrick Fraikor, director of CSM’s Colorado Advanced Materials Institute, and Tim Casias, an undergraduate student in the George S. Ansell Department of Materials and Geochemistry, submitted the winning entry, “Scanning Electron Microscopy of Petrified Wood Archeological Artifact.” The poster was also one of five finalists for the Jacquet-Lucas Award for best in show.

The CSM research project, associated with the poster is funded by the State Historical Fund with a team of faculty and student investigators including E. Craig Simmons, Chemistry and Geochrometry; Hans Joachim Kleebe, Materials Science; Andrea Elliott, Chemistry and Geochrometry; Helen Kearney, Materials Science graduate student; and Mark Eberhart, Chemistry and Geochrometry.

In July a film crew used the Mines campus as its location for the taping of a television commercial.
Taylor Named Speaker

Patrick Taylor BS Met ‘74, BSc Math ‘74, PhD Met ‘78, George S. Ansell Chair
Distinguished Professor of Chemical Metallurgy, has been invited to speak at the 2004 Extraction & Processing Division Luncheon at the 133rd Annual Meeting & Exhibition of The Minerals, Metals & Materials Society in Charlotte, N.C., in March. His presentation will be titled "Extractive Metallurgy Today and Tomorrow—An Academic's Perspective."

Brooker Discusses Violence, Imagination and Literature

The Division of Liberal Arts and International Studies announces that the 2003-2004 Hennebach Visiting Professor is Jewel Spears Brooker, a professor of literature at Eckerd College in St. Petersburg, Fla. Her lecture series—open to all CSM students, staff, faculty and the public—is titled "Violence, Imagination, and Modern Literature."

U.S. Task Force Hears Testimony


CSM Alumni Association

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Records

Central

Chicago
August 1, a group of Miners, friends and family got together for a Cubs game in Wrigley Stadium. Afterward, the group parted at the home of Jeff Babcock Met E ’65.

Missouri
Several Mines alumni turned out to watch the Orediggers football team beat University of Missouri at Rolla.

Gulf Coast

Houston
Houston Happy Hour: From left, Louise Jacobson BS Pet ’00, Meghan Quiat (current student), and Laura Westler BS CPR ’00 enjoyed getting together for happy hour June 26.

Ground was broken in September for three sorority houses, Sigma Kappa, Pi Beta Phi and Alpha Phi.
Dallas
Twenty alumni and friends attended a get-together of the Dallas section in June. Seated around the table starting at left, Gulshan Amlani, Jack Parkin Geop E ’53, Nancy Alexander BSc Math ’76, Will Culp BSc CPR ’99, Diane Brownlee BSc CPR ’75, Kevin Janowski BSc Chem Eng ’82, Les Crum MSc Min Ec ’80, John Gorman MSc Env Sc ’92, Elizabeth Gorman, Tim Saenger BSc Phy ’95, Azy Madani BSc Chem Eng ’01, Scott Darling BSc Pet ’87, Chip Hodge (on the stool), Kathy Roldan BSc GeoP ’88, Suzanne Heskin BSc GeoP ’01, James Heskin, Keith Brownlee BSc GeoP ’75, Kevin Smith BSc GeoP ’82, John Wise PRE ’68, James Messer BSc Met ’92. Photos by Will Cup.

Utah
Bob Pearson ’59 traveled to Utah to watch the Orediggers soccer team compete in two games the last weekend in August. Afterwards, the team and supporters met for an after-game meal.

Grand Junction, Colo.
Aug. 14, the Grand Junction section sponsored a send-off party for new freshmen from that area. Thirty-six people attended along with three new freshmen and their parents.

Denver
The August mixer at the Wynkoop Brewery, owned by Denver’s new mayor, John Hickenlooper, drew some regulars and some new faces.

This year’s freshman class was welcomed by volunteer alumni (wearing the red shirts) who helped out on move-in day at the dorms Aug. 15. The Alumni Association also sponsored a picnic for freshmen and their families that day and about 225 people showed up at the Coolbaugh House for a barbecue lunch. The following Monday, alumni volunteers distributed water during the M-Climb in the morning and flipped burgers and mingled at the graduate student picnic held on Kafadar Commons that afternoon.

If you’d like to help at future fun events, contact the Alumni Office at 303-273-3295 or e-mail to csmaa@mines.edu.
RESEARCH

- Recovering methane from sandstone aquifers is being explored in a new approach that works by lowering the aquifer to recover trapped gas. Because this technique generates a fair amount of produced water, economic ways to treat the water for beneficial reuse to make the process more attractive are also being studied.

- The Reservoir Characterization Project focuses on acquisition, processing, interpretation and visualization of time-lapse geophysical data – repeated measurements over an operating field that help detect and track changes in the Colorado fields due to the movement of fluids (water, oil, gas) in the production and enhanced recovery processes.

- The Center for Wave Phenomena focuses on new theoretical and computational techniques for processing seismic data from fractured reservoirs. Such data exhibit all the complexities associated with wave propagation through inhomogeneous, anisotropic geologic environments and demand sophisticated mathematical techniques applied to the data using computationally intensive algorithms on parallel clusters of Linux processors. The Center develops, maintains and supports the open-domain Seismic Unix processing system, which has been installed on nearly 3,000 systems in more than 60 countries around the world.

- Mines expertise in scientific computing and numerical analysis provides computational modeling of gas flow and scientific data visualization, an essential component in data analysis for reservoir characterization.

- The huge natural gas reservoirs located in dirty, low permeability “tight” geologic formations common in the Rocky Mountain basins are the focus for research in well stimulation hydraulic fracturing techniques. New computer modeling techniques simulate 3-D and 4-D reservoir behavior.

- The Center for Hydrate Research studies natural gas hydrates that are encountered in energy exploration and production. In exploration, the Center measures and models hydrates in the oceans. In production, it concentrates on flow assurance, i.e., keeping the pipelines free of hydrate plugs - the estimated cause of >90% of the flow obstructions in deepwater gas production sites around the world.

- Researchers are investigating the quantitative kinetic characterization of reaction systems, especially those where kinetics and transport are coupled. Reactions that occur during direct hydrocarbon oxidation in high-temperature solid oxide fuel cells are being studied. Once the gas-phase and heterogeneous kinetics have been characterized, they can be included in the combined transport-kinetic models needed for optimization of fuel cell performance.

- New processing techniques are being designed and new and improved materials are being developed for the synthesis of thin film electrodes, solid electrolytes, the minimizing of corrosion and oxidation problems and the maximizing of transport efficiencies in proton transfer fuel cells, PEM fuel cells, and solid oxide fuel cells.

- Using a combination of electronic structure calculations and chemical activation analysis, researchers are identifying the effect of pressure and temperature on the product distributions of key reactions that lead to production of the aromatic precursors that ultimately lead to formation of soot and or deposits in an effort to reduce pollution.

- The green alga Chlamydomonas reinhardtii generates H2 by means of an Fe-hydrogenase-mediated system that has the highest potential energy efficiency of any known photosynthetic H2-generating mechanism. To maximize the hydrogen-producing capacity of the alga, researchers are working to optimize a known hydrogenase through molecular engineering to identify enzymes involved in the regulation of hydrogenase synthesis and to develop a new high-throughput assay for biological H2 production.

- Research on the pyrolysis of biomass includes developing new pyrolysis reactors to produce hydrogen from tree thinnings obtained from western forests.

- Better transparent conducting oxide layers for photocell applications are being developed to bring fusion energy to commercial reality. A charged particle detector that can withstand the extreme conditions inside the fusion reactor vessels has also been developed and can be used to diagnose the fusion production.

- Innovative new metal-substituted hexaaluminate catalyst materials that show good activity as lean-combustion catalysts with excellent high temperature stability for catalytic combustion are being developed.

- Modern diesel injectors are very high pressure resulting in improved fuel atomization. Since fuel/air mixing is a critical component for in-cylinder control of emissions, full utilization of this new injection technology requires a deeper understanding of the transient diesel mixture preparation/combustion process. The combined experimental and modeling effort aim to improve the understanding of the relationship between fuel injection as a controlling parameter for diesel efficiency and emissions.

- university in the United States with programs from the baccalaureate through the doctorate in all of the key fields related to energy.

The School is home to the Colorado Energy Research Institute, recently reestablished with support from the Colorado Energy Management and Conservation. It develops energy research and educational programs throughout the state including fossil fuel, renewable and alternative energy technology, as well as energy efficiency and conservation. In addition, the School houses 13 centers and institutes directly related to energy. CSM also has a unique collaboration with industry in its development of The Petroleum Institute in Abu Dhabi, which opened its doors to students in 2001.

All Mines departments and divisions are involved in energy-related projects including fossil fuels, alternative energy sources, combustion, nuclear energy and materials energy storage technology, power distribution technology, and energy economics and policy. Much of the study is interdisciplinary. For example, molecular hydrogen (H2) is a promising future energy carrier because of its clean combustion and potential for sustainable production and is being studied in a variety of ways. One problem associated with an economy using hydrogen is that the energy and power density of gaseous H2 is low unless the gas is highly compressed. So, for example, the range on a hydrogen fuel cell is only a few miles unless we compress the hydrogen to high pressures. Mines researchers are working on a variety of possible solutions to this problem.

In addition to hydrogen fuel cells, researchers at CSM are studying solid oxide fuel cells, which will convert a hydrocarbon, like gasoline or ethanol (ethyl alcohol), directly into carbon dioxide, water and electricity. These efforts could make it possible to use the
RESEARCH

- Spray rolling, an innovative and energy-efficient manufacturing technique to produce aluminum net-shape products, is being studied. Spray rolling combines spray forming and twin-roll casting. It requires less energy and generates less scrap than conventional processes and, consequently, enables the development of materials with lower environmental impact in both processing and final products.

- Understanding ignition kinetics is essential to being able to reliably characterize events such as ignition in a low-temperature homogeneous charge compression ignition (HCCI) engine. The improved mechanisms can be used to suggest combinations of fuel and engine conditions that should lead to more robust operation of the HCCI engine.

- The OpenChem Workbench (OCWB) Project is developing an integrated suite of reaction engineering software utilities for the simulation of gas-phase chemical reactors. The aim of this software is to put powerful chemical reactor modeling tools into the hands of a broad array of chemists and chemical engineers. Only specialists have the expertise to operate the current software. The types of processes that can be modeled and optimized using the OCWB include some of the most energy-intensive operations in the chemical process industries: combustion and pyrolysis cracking.

- A process and a reactor to deposit CdTe films by atmospheric-pressure chemical vapor deposition are being designed. The atmospheric-pressure process has potentially great advantages over vacuum-based processes for the high volume production that is needed for cost-effective manufacture of terrestrial photovoltaic cells. Photovoltaic research includes chemically reacting how modeling to support manufacturing reactor design and control, development of chemistry models for the CdTe deposition process, and film growth and process demonstration.

- How to minimize radioactive wastes produced by nuclear energy plants and what surrogate materials might be used for devolving techniques for radioactive materials processing are being studied.

- Bacterial colonies in permeable reactive barriers to passively treat uranium-contaminated groundwater at abandoned uranium mine sites are being studied. One consequence of uranium mining is widespread contamination of groundwater. A number of technologies are available for treating uranium-contaminated groundwater but their general high cost and relative inefficiency make them impractical. Bacteria are being used to transform uranium from the soluble, mobile oxidized form to one that is reduced and less mobile.

- New materials and processing techniques for long-life, rechargeable batteries are being developed, as well as new materials (intermetallics, carbon nanotubes and nano-particles) and processing techniques for improved hydrogen storage capabilities.

- Electrical energy systems engineers are concerned with all aspects of generation, transmission, distribution and utilization of electrical energy. They are pursuing both fundamental and applied research in the interrelated fields of conventional electric power systems and machinery, renewable energy resources, distributed power generation and power electronics. Current research includes application problems in power systems, energy engineering education, power quality, variable drives, microgrid system and interconnection issues to deal with distributed generation.

- Researchers are studying the application of risk and investment theory to the petroleum industry to provide guidance to firms and decision makers with regard to developing strategies, allocating resources and managing risk. Another focus is energy integration and portfolio management and decision analysis, the application of portfolio management to oil and gas exploration and production, an investigation of corporate risk tolerance and performance in oil companies, and a behavioral study of risk taking at a major oil company.

- Recent energy-related doctoral research developed a system of integrated software applications to allow the Minerals Management Service to estimate revenues from natural gas production on federal properties, particularly in the Gulf of Mexico. The mathematical model constructed decides when it is profitable to consider conversion from royalties-in-value (cash payments) to royalties-in-kind (physical molecules of gas).

- Researchers are studying connections among natural resources, political corruption and development, with a particular focus on petroleum. How do the different governments manage windfalls and rents from abundant natural resources, such as oil and petroleum, and why do these countries tend to perform worse economically than those without similar endowments?
Endowed Faculty Chairs Help Drive Research

Colorado School of Mines is able to maintain its position as a national and international leader in energy thanks to its ability to attract top research scientists and engineers. In addition to the School’s longstanding reputation for excellence in energy, several distinguished endowed chairs and professorships that help retain highly talented faculty have been created in energy-related disciplines. The holders of these endowed positions attract support from a range of public and private agencies for the development of innovative energy-related research and instructional programs. Furthermore, their stature and accomplishments draw additional faculty members and high-caliber graduate students interested in furthering the specific field of research.

Mines is currently fortunate to have faculty occupying 17 endowed chairs and professorships, many of whom are conducting energy-related research. Six such individuals are featured below:

Dr. Anthony M. Dean is Mines’ William K. Coors Distinguished Chair in Chemical Engineering. Dean joined the faculty of Mines after serving 21 years at the Corporate Research Laboratory of ExxonMobil Research and Engineering Company; prior to that he taught at the University of Missouri. A board member of the Combustion Institute, Dean is currently researching reactions that occur during direct hydrocarbon oxidation in high-temperature solid oxide fuel cells, with the goal of developing a means to optimize fuel cell performance. Dean is also working on identifying hydrocarbon structures that are less likely to produce the specific free radicals that lead to soot or deposit formation.

Dr. Robert J. Kee, the George R. Brown Distinguished Chair in Engineering, is the former manager of the Thermal and Plasma Processes Department of the Sandia National Laboratories and the winner of such awards as The Silver Medal of the Combustion Institute, The Beatrice Award for Outstanding Contributions to Technology Transfer, and DOE Basic Energy Sciences, Sustained Outstanding Research in Materials Chemistry. Kee is currently working on a portfolio of alternative energy research projects, including solid-oxide fuel cells, catalytic combustion, and thin-film photovoltaics. All of these technologies will help advance the energy industry’s efforts toward environmentally-friendly and sustainable production and distribution.

Dr. Kenneth L. Larner Geosp E ’60 and PhD graduate from MIT, is the Charles Henry Green Professor of Exploration Geophysics and the director of CSM’s Center for Wave Phenomena. Prior to joining the faculty of Mines, Larner was the vice president for geophysical research at Western Geophysical Company. Larner, a past president of the Society of Exploration Geophysicists, recently served as a Society of Petroleum Engineers distinguished lecturer, and this year received the P. L. Kapitsa Gold Medal of the Russian Academy of Natural Sciences, its highest award. His research interests include imaging of the Earth’s subsurface with an emphasis on application of the seismic method to seismic data processing for exploration and development of hydrocarbons.

Dr. Dennis W. Readey is the Herman F. Coors Professor Chair in Ceramics and past president of the American Ceramic Society. Before coming to Mines, Readey was chairman of the Department of Ceramic Engineering at Ohio State University and prior to that he was a program manager in the Division of Physical Research of the Department of Energy. Readey directs CSM’s Colorado Center for Advanced Ceramics, which is currently researching fuel cell, solar cell and battery materials with funding from the National Renewable Energy Laboratory (NREL).

Dr. E. Dendy Sloan is the Gaylord and Phyllis Weaver Distinguished Professor in Chemical Engineering and Petroleum Refining and the director of CSM’s Center for Hydrate Research. Sloan is the recipient of numerous campus and national awards, including the Presidential Award as Outstanding CSM Educator, the CSM Faculty Senate Distinguished Lecture Award, and the Donald L. Katz Research Award of the Gas Processing Association. His history of 30 years of hydrates research has been supported by a consortium of 12 corporations. He is a Fellow of the American Institute of Chemical Engineers. Dr. Roel Snieder holds the W.M. Keck Foundation Distinguished Chair in Exploration Science. Prior to joining the faculty, Snieder was professor of seismology at Utah University, where from 1997-2000 he served as dean of the faculty of Earth Sciences. In 2000 he was elected as Fellow of the American Geophysical Union for important contributions to geophysical inverse theory, seismic tomography, and the theory of surface waves. Snieder is one of the four faculty members of the Center for Wave Phenomena, a research group that is supported by a consortium of 25 companies from the petroleum industry with the aim of making exploration and production of hydrocarbons more efficient.
To Learn More About Energy, Government Policymakers Go to the Source

Tours of energy sites in Colorado, Utah and Wyoming, participants in the 2003 Energy and Minerals Field Institute (EMFI) in August saw a “buffet, a smorgasbord of Western energy resources,” as William Wicker described the experience. “It gave exposure to the greatest variety of resources possible,” added Wicker, who serves on the U.S. Senate Committee on Energy and Natural Resources.

The EFMI, originally called the Energy Field Institute, was established in 1978 to create a forum for exploring interactions between regional energy development in the West and federal policies. Due to a decline in financial support from the federal sector, many of the Institute’s major programs were discontinued in 1996. In 2003 the Colorado Office of Energy Management and Conservation provided funding to reactivate the Colorado Energy Research Institute (CERI), which is administered by CSM. Together with matching financial support and in-kind contributions from CSM, the reestablished CERI provided sufficient funding to the CSM Office of Special Programs and Continuing Education (SPACE) to conduct the summer Institute.

“Through EMFI, the School has provided valuable input to the policymaking process and has gained the recognition and respect of many in the public sector,” said Gary Baughman MSc CPR ’73, PhD CPR ’74, director of SPACE and former EMFI director. Other EMFI organizers were Erling Brostuen, Melody Francisco, Jim Proud and John Rold.

“I now have a better understanding of the whole energy picture. This was a very comprehensive, hands-on week. I work in renewables in the fossil were most interesting to me. I had my eyes opened to things I had no experience with, and experiences are so much better than another PowerPoint presentation. Discussions with both sides showed the amount of compromise that will be necessary in the future.” - Roger Meyer

“The whole package was interesting. I wanted to experience new things, and I had never been to a power plant. I learned an integrated view of the whole energy picture, and I got it.” - Gene Whitney

The Pennequin Wind Farm, located south of Cheyenne on the Colorado-Wyoming border, this wind farm is operated by Xcel Energy.

The Jim Bridger Power Station in Rock Springs, Wyo. Institute participants learn about converting coal into electricity.

West Elk Mine in Somerset, Colo. “The Glowworms”—one of the EMFI groups underground at the mine—sport reflective vests.

National Renewable Energy Laboratory’s Outdoor Test Facility in Golden, Colo. Peter McNutt of NREL explains the operation of the solar collectors at the OTF.

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The Jim Bridger Power Station in Rock Springs, Wyo. Institute participants learn about converting coal into electricity.

West Elk Mine in Somerset, Colo. “The Glowworms”—one of the EMFI groups underground at the mine—sport reflective vests.
Tony Newlin MSc CPR ’96 is both an engineer at Intel Corporation and a nature photographer. At Intel, he applies mathematical tools to supply chain optimization. In nature, he captures the beauty of the wilderness on film.

Growing up in northern New Mexico, Newlin often camped with his family in the San Juan Mountains of Colorado and developed an appreciation of the great outdoors. He observed nature long before he decided to photograph it. He mountain bikes, flyfishing, hikes or takes a float plane to remote places to find animals in their habitats, where he tries to photograph them without disturbing them. Newlin now lives in Portland, Ore., and often travels to Alaska.

With no formal training, Newlin became serious about photography in the summer of 1996 while on a kayaking trip in the San Juan Islands. He uses 35 mm Nikon cameras for his photos and sells his prints over the Internet (www.tonynewlin.com) and at various lodges in Alaska. Next summer, he plans to open a gallery in Telluride, Colo.
Dear Fellow Alumni and Friends,

After more than 15 years, I’ve finally gotten over the dread that comes with the end of summer and the start of classes at CSM. As a matter of fact, I had an absolute ball as the fall semester got underway this year. Of course, I’m not facing a semester of thermodynamics, linear algebra, transport phenomena or any other classes. But still, it was a thrill to be part of the excitement and eagerness of the dawn of a new school year at Mines. For the first time, the Alumni Association participated in some events that I hope will become new traditions for us and the School.

On freshman move-in day, Aug. 15, alumni volunteers helped freshmen and their families get settled in. Alums decked out in snapety polo shirt’s were present at each of the dorms greeting students and their families, making them feel as much at home as a new frosh can feel in the first five minutes on campus. That same day, the Association and Student Life hosted a barbecue luncheon for freshmen and their families. It was a wonderful opportunity for alumni and staff to visit with and get to know the students and their families.

Alumni also volunteered on Aug. 18 helping Blue Key and Student Life during the traditional “M” climb. We manned a water station along the route to help revitalize the kids on their way up Mt. Zion. See the website (www.alumni.friend.mines.edu, then click “Recent Events”) for photos. Does that bring back some memories?

Later the same day, alumni volunteers manned the grills and food lines for the Graduate Students Association picnic. We had a great turnout with grad students and flipping burgers and hot dogs as fast as possible.

The positive response from these events, volunteers from students, and our families was overwhelming. The alums had a ball and the students enjoyed visiting with those of us in liners who have “gotten out.” The freshman parents appreciated the attention and the effort to help them and their frosh get that at-home feeling.

I see two important things in these events: we were done by alumni volunteers, and they involved alumni interacting with students on a personal basis. We may forget that comes with the end of summer and the start of classes at CSM.

We are working hard to have a greater presence on campus, to be visible and known to students and faculty, and to be part of the campus experience. I see students as alumni-to-be who will soon join us in the esteemed ranks of CSM alumni. We want them to be part of us, and we want to be part of their lives. To succeed, the Association must engage students as soon as they come to the School. Besides, it truly is enjoyable and rewarding to spend time with them!

Remember, the Alumni Association is all about people – people who have graduated from Mines – or will someday – and people who work as leaders as we do. As I mentioned at the start of this letter, I hope these events will take root and become traditions for the Association and the School. And also that the class of 2011 continues, we can build upon these events and create more opportunities and more traditions. Even if you don’t live within reach of campus, make the opportunity to meet Mines students and their families from your hometown. Participate in the send-off parties and the Alumni Admission Representative program. Return to campus for Homecoming and Reunions. It is our responsibility to help shape the future of the body of Mines alumni by becoming actively involved on a personal level with each other and with our future fellow alumni!

Sincerely,

John N. Schwartzberg BSc Met ’88, P.E.
President, Colorado School of Mines Alumni Association

Gary F. Abbott BSc Eng ’94
M. Maclean Price BSc CPR ’96
Michael D. Fingler Geol ’94
Perry K. Hurlbut Geol E ’40
John M.Stores BSc Pet ’89

Engineering New Traditions

Become a Member of the Alumni Association

MEMBERSHIP:

We invite you to join the Alumni Association. Membership in the Alumni Association entitles you to all the benefits listed above. Membership is open to Mines alumni and those who have attended Colorado School of Mines for at least one year.

Application Completed and Signed

Please return this form to: Colorado School of Mines Alumni Association, 300 Crockett Street, Golden, CO 80401

Membership dues are $20.00 per year. Please send check or money order to: Colorado School of Mines Alumni Association.

Join the Alumni Association and begin your new traditions.

MEMBER: $20.00/year

STUDENT: $10.00/year

LIFETIME MEMBER:

$400.00

Benefits of Membership include:

• Annual Membership newsletter
• Alumni Association website
• Alumni connection

CONTACT INFORMATION:

Name:
Address:
City, State, Zip:
Email Address:
Phone:
Signature:

Life Membership is available to Mines alumni and those who have attended Colorado School of Mines for at least one year. Life Members play a role in the future of Mines future.

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In 1929, the Association's first Honorary Membership was conferred on Erle O. Kiester. Kiester volunteered his services as football coach in 1922 after the Miners had suffered “three unsuccessful and dreary seasons,” according to the 1929 Mines Magazine that announced the honor. Kiester turned things around immediately. The 1929 season closed in triumph, with the Miners on the “unconquered champions of the Conference,” said the article. “Kiis” as he was called, led the team until 1914 when he resigned because of business activities. But in 1929, when the team’s future once again looked gloomy, he returned as “an ‘inspirational Coach,” talking to the boys on the field and injecting spirit and enthusiasm into them.” Although not a Mines graduate himself (he was from Yale and had played fullback on one of its famous teams), he nonetheless “placed Mines on the football map.”

Kiester was joined by Claude L. Barker, EM ’31. Barker was active in industry, school and Association affairs. Among other things, he headed up the Colorado Mining Association summer educational program to familiarize high school teachers with the mineral industry. In 2002, David L. Coolbaugh, Gt E ’43, EM ’47, DSc Geop ’61 won the award that was named after his father. Dave has a long history of service to the School and the Association. He currently chairs the CSM History Project, which is overseeing a book to be published next year. The recipient of this award need not be an alumni. In 1995, the award was given to Bob Weine, a CSM geology professor from 1957-1983. Frank Stermole, a chemical engineering and mineral economics professor, received the award in 2001.

The Young Alumni Award was instituted in 1986. Because the Association’s other awards usually are given to mature alumni with many years of service, the Association’s board of directors decided to establish recognition for young alumni who show enthusiasm for supporting the Mines community early in their careers. The award is given to alumni under 40 who have received their first degree from Mines while they were under 25. Tim Hoops, EM ’79, was recognized for his work in establishing the CSM AA annual golf tournament. To date, the tournament has raised $102,500 for the emergency student loan fund.

Honorees of CSMAA awards have their names engraved on plaques displayed in the Association office. A complete list of winners also appears in the annual directory. If you know of a deserving person who should be honored by the Association, please submit the name, along with backup material, to the CSM AA office.

By Maureen Keller
New Leading Ladies in Golden

By Greg Murphy

This past winter, a pair of longtime Mines head coaches decided to call it a career. Michele Harris, a 20-year veteran of the volleyball program, decided to step away in order to devote more time to her family. In addition, Travis Brown, a 10-year member of the men’s basketball coaching staff, is retiring from his duties.

Athletics Director Marv Kay EM ’63 and two search committees, committed to finding quality coaches, saw the programs going in the right direction, finally decided on Shelly Johnson as the head volleyball coach and Paula Krueger to take over the women’s basketball program. Johnson arrived in Golden after serving the past three seasons as an assistant coach at Wayne State (Neb.), while Krueger came to CSM after a successful six-year stint as an assistant coach at Northern State.

In addition to their coaching staffs, both were standout student-athletes. Johnson was selected as an NAIA All-American in 1992 and Wayne State while Krueger was named the Most Valuable Player of the 1992 National Tournament during Northern State’s championship campaign in 1992–93. Each coach hopes to bring with them ideas and concepts they have already learned as players and coaches.

“When I was at Wayne State, it was a real tradition,” Krueger said. “I want to establish that same type of tradition here at Mines and incorporate players on the team. The community of Golden and the Mines administration have welcomed me and have been very supportive.”

Krueger echoed those comments saying, “The athletic staff has embraced both Shelly and I with open arms and has made the transition very easy. I am very comfortable around the Mines and absolutely love the small town atmosphere of Golden.”

Both coaches have benefited by hiring outstanding assistant coaches for their respective programs. Krueger brought in her sister, Kasey, as an assistant coach. “It’s great to have Kasey here teaching the setters,” Johnson said. “I can rely on her to take the setters’ skills and take those on to our student. Shelly and I both have our own styles and the setters have to learn each other’s styles. It was a perfect fit.”

Meanwhile, Johnson is extremely excited to have Kasey by her side after Kasey lettered four years as a setter at Wayne State, including the final three seasons with Shelly as an assistant coach. “It’s great to have Kasey here teaching the setters,” Johnson said. “I can rely on her to take the setters’ skills and take those on to our student. Shelly and I both have our own styles and the setters have to learn each other’s styles. It was a perfect fit.”


Harris has returned to her family. In addition, Kay was named the Rocky Mountain Athletic Conference Coach of the Year and the American Football Coaches Association D-3 Coach of the Year in 1977 and 1978 as well as the National Intercollegiate Athletics District I Coach of the Year in 1978.

In addition to his service at Mines, Kay has been an instrumental figure in the city of Golden. He has served as the chairman of the Golden Buffalo Bills Day Celebration, the chairman of the Golden Buffalo Bills Day Celebration, the chairman of the Golden Buffalo Bills Day Celebration, the chairman of the Golden Buffalo Bills Day Celebration, the chairman of the Golden Buffalo Bills Day Celebration, the chairman of the Golden Buffalo Bills Day Celebration and the chairman of the Golden Buffalo Bills Day Celebration.

FOOTBALL: The Orediggers are just 2-0 on the season, but have shown signs of improvement from years past as they have hung tough with the teams in the upper echelon of the Rocky Mountain Athletic Conference. Mines, which has posted wins over Western New Mexico and Missouri Rolla, is being led by junior Chad Frieberg who has thrown for more than 1,400 yards and 10 touchdowns. Sophomore linebacker Jared Heath has registered 62 tackles and is among the national leaders in that category.

VOLLEYBALL: After winning just one match last season, Mines has posted a 6-12 mark through 18 matches this season. Perhaps the best win of the season was a convincing 3-0 triumph over Mesa State, the preseason favorite in the RMAC West Division. Senior Lauren Ramsey leads the team in kills (193) and blocks (73), while senior Sonia Hestevolte has posted a team-best 255 digs, 44 kills and 12 aces. She was also named to the Clash in the All-Tournament Team.

SOCCER: Mines has posted a 5-9 mark this season. Each match has been closely contested. Six of the losses have been by one goal, while another loss was by two goals. On the other hand, three of the Orediggers’ five victories have come via shutouts. Senior Jared Peacock leads the team with eight points, while senior Robbie Williams, junior Justin Buck and sophomore Mike Dixon have six points apiece.

CROSS COUNTRY: The Mines cross country teams have been extremely competitive in their races this season and competed at the RMAC Championships on Oct. 25 in Lakewood. The Mines women, ranked 10th in the region earlier this season, have been led by super sophomore Heather Bercerof, while senior Derek Hudson has paced the men’s squad.

ON THE NET: Now you can get all the latest and most comprehensive news on Oredigger football and Colorado Mines athletics 24 hours a day by visiting the Colorado School of Mines Athletics Department’s official website at http://athletics.mines.edu.

JOIN THE OREDIGGER E-MAIL LIST: Get all the latest news on all of Colorado Mines Athletics by signing up for the Orediggers’ E-Mail List. Receive daily updates, game recaps and press releases on all of Mines’ athletic teams by e-mailing Sports Information Director Greg Murphy at gmurphy@mines.edu. Please indicate in your e-mail which sport reports you want, or if you want to receive news of all sports.
Beckley '85 Turns Hobby into Business

By Heather McGregor

Steve Beckley BSc Pet '85 always wanted to own a commercial cave, a place where he could take people underground and show them the wonders he discovered as a hobby caver. “I thought it would be neat to have something for people to come and see to enjoy themselves in a natural environment,” Beckley said.

In 1998, his dream began to come true when a door of opportunity opened at the historic Fairy Caves in Glenwood Springs, Colo. By then, he shared the dream with his wife, Jeanne. In 1992, Prebble agreed to let the couple enter the cave. Accompanied by a Texas caver hand-picked by Prebble, the two entered the Fairy Caves and made their way to Jam Crack, which at the time was the only way to get down to the vast network of undeveloped caverns in Iron Mountain. Jam Crack is a vertical opening in the limestone, 30-feet deep and about 8.5 inches wide. The three cavers inched their way down the crack, so narrow they couldn’t even turn their heads. “You make a commitment, left or right, and then you go down,” Beckley said.

They drilled a new entrance with airlock doors and installed a system to be safe and subtle. On Memorial Day weekend in 1999, they opened the caves for the touring public. This was Jeanne Beckley’s second time caving and she nearly lost her nerve. But the Texas caver convinced her that Jam Crack was the worst spot, and everything else would be fine. “He lied to me,” she said with a laugh, remembering the rest of the route. “It took us three hours to get from the entrance down to the Barn; it turned into a 10-hour caving trip.” But the strain was worth it. “It was so incredibly beautiful,” she said. They saw the Barn, a huge cavern embellished with thousands of soda straw stalactites, flowstone, cave bacon and glowing stalagmites. And they went farther down to see King’s Row - now the end of the developed tour - a garden of stalagmites.

“With the help of friends, they worked for months turning the caverns into a space that could be visited by ordinary people. They drilled a new entrance with airlock doors and installed a boardwalk and 127-foot staircase and landings so people could walk down. They reworked the century-old electric lighting system to be safe and subtle.”

During winter and early spring, the road was simply too dangerous for the tour buses so the caverns closed in the winter. But with the recent opening of the Iron Mountain Tramway, a joint project of the Beckleys and another Glenwood Springs couple, the caverns are now open year-round. With a tramway, a mountaintop restaurant and gift shop, trains, an observatory, a children’s discovery center and the caverns offered, they changed the name of the tourist attraction to Glenwood Caverns Adventure Park. “We always wanted to show people what you can see in a cave, but in most caves you’re crawling through tight spots,” Jeanne said. “With these carefully developed caverns, visitors don’t even get their shoes dirty. But they come away with a smile, which pleases the Beckleys.”

Luengo ‘85 Builds Hydro Plants in Guatemala

Javier Luengo BSc Pet '85 is a consultant in the hydroelectric field working mostly on new projects in Guatemala. “I have experience designing, building and operating hydro plants," he says. “During the pre-feasibility and feasibility studies it is normal to meet with the local villagers and authorities on a regular basis.”

The power plant Luengo is currently working on will provide local villagers with jobs in addition to power. All the projects I have been involved with are private. “Other benefits are greater sales of goods during construction, transportation to and from the sites to the near villages, consumption of goods and services from nearby towns and villages and housing rentals,” says Luengo. He has seen communities improved by new roads and bridges being built and community lighting installed.

“Being a petroleum engineer, this field of work is totally different for me," Luengo says, “but my Mines engineering degree has helped me during the years in different fields of work.” In the five-plus years Luengo has been involved with hydro plants, he has traveled to Switzerland twice (where he snow skied), Canada, the United States, Mexico, Costa Rica, Honduras, Colombia and a variety of sites in Guatemala.

“Searching for oil and producing it, which I did years back, is very interesting,” he says, “but what I really like of the field I’m in now is that the energy is clean and friendlier with the environment!”

Reprinted with permission from the Glenwood Springs Post Independent.
### November
- **13** Golden, Colo. Lunch Bunch: second Thursday of every month. An informal alumni get-together meets at the Buffalo Rose in Golden, Colo., 11:30 a.m. Denver Mixer: second Thursday of every month. Wynkoop Brewing Company, 1634 18th Street, Denver, 5:30 p.m. No charge at door, pay own way.

### December
- **11** Golden, Colo. Lunch Bunch (see Nov. 13 for details). Denver Mixer (see Nov. 13 for details).
- **18** Grand Junction, Colo., section luncheon (see Nov. 20 for details).

### January
- **08** Golden, Colo. Lunch Bunch (see Nov. 13 for details). Denver Mixer (see Nov. 13 for details).
- **15** Grand Junction, Colo., section luncheon (see Nov. 20 for details).

### February
- **08** Golden, Colo. Lunch Bunch (see Nov. 13 for details). Denver Mixer (see Nov. 13 for details).
- **15** Grand Junction, Colo., section luncheon (see Nov. 20 for details).

### March
- **11** Golden, Colo. Lunch Bunch (see Nov. 13 for details). Denver Mixer (see Nov. 13 for details).
- **18** Grand Junction, Colo., section luncheon (see Nov. 20 for details).

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### Mines Annual Fund

The gifts we give reflect the values we hold. When you make a donation to the Mines Annual Fund, you affirm your loyalty to the School.

A contribution to the Mines Annual Fund expresses your belief in a Mines education. Your tax-deductible donation will help support student scholarships, academic programs, sports, as well as many other aspects of campus life.

Giving is part of the School’s legacy. Participating in this tradition supports Mines students in tangible ways. It is also an expression of appreciation for the role the School has played in your life.

You can support the Mines Annual Fund by:
- Mailing a check to the address below.
- Making a pledge online: [www.oia.mines.edu/give/](http://www.oia.mines.edu/give/).
- Pledging during the annual phonathon, or
- Responding to upcoming mail/email solicitations.

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### Alumni Notes & Quotes

#### Edward's '61 Retires After Long Mines Career

Glen R. Edwards Met ‘61, a professor of metallurgical engineering and co-founder of the Center for Welding Research (now the Center for Welding, Joining and Coatings Research - CWJCR), has retired from CSM. Edwards worked for Los Alamos National Laboratory while studying for his master's degree in materials science. He also earned a Ph.D. from Stanford University in 1971. Edwards began his career at Mines in 1976 and was a full professor by 1979. He has devoted the last 27 years to course development, materials research and both undergraduate and graduate education. He helped found the CWJCR in 1982 and assumed directorship in 1987.

#### Two Named to Mining Hall of Fame

George O. Argall Jr. EM ‘35 and Russell L. Wood EM ‘49 were inducted into the National Mining Hall of Fame in Leadville, Colo., in September. Argall (1933-2002) was an internationally famous mining engineer, technical editor and publisher. During his career he visited and reported on mining operations in 66 nations. He took special pride in getting a story right. On his typewriter, Argall taped three words so he could always see them: accuracy, accuracy, accuracy. As a youngster, Argall went to school in the building that is the core of the National Mining Hall of Fame and Museum in Leadville.

Wood (1927-2001) was a consummate mining engineer. He generously used his resources for the benefit of CSM and the communities in which he lived. His relationships with laborers and leaders of industry were sound, good-natured and successful. Wood served on the School’s Board of Trustees for 35 years including seven as president. Each year, the Mining Hall of Fame selects men and women who pioneered the discovery, development and processing of our nation’s natural resources to add to its roster. This year’s group included six people bringing the total honored to 179.

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### Calling All Alumni

**CSM Credit Union**

Invites the Alumni of Colorado School of Mines

To Join the CSM Credit Union Family

**Serving Members since 1955!!**

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**Stay in Touch for ALL Your Financial Needs**

- **Savings**
- **Checking**
- **VISA Credit Card**
- **Pension Loans**
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**Little White House on Campus**

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**Glen R. Edwards Met ‘61**

Dr. Kurt M. Strack MSc Geoph ’81, president of KMS Technologies - KJT Enterprises located in Houston, has received a Distinguished Technical Achievement Award for 2003 from the Society of Petrophysicists and Well Log Analysts, during its annual conference June 24 in Galveston, Texas. Strack’s company specializes in borehole logging tool and permanent sensor development. He serves as an adjunct professor in the geosciences department at University of Houston where he teaches borehole geophysics.
Phalanx

Mines Acknowledges Individual Donations

Colorado School of Mines received gifts of $25,000 or more from the following individuals between March 21 and August 31, 2003. Acknowledgements for corporate and foundation gifts since the last issue of Mines will be included in the winter issue.

Jerome '64 and Becky Brousard completed their Transforming Resources campaign pledge with a payment of $50,000. This gift supports scholarships for students in the Engineering and Technology Management master's degree program.

Holland Coors made a gift of $25,000 to support the Advanced Coatings and Surface Engineering Laboratory in the Department of Metallurgical and Materials Engineering.

A gift of $355,937 from the estate of James D. and Allis V. Corbett was used to establish a trust that will provide scholarships for students in Petroleum Engineering.

A Transforming Resources campaign pledge of $200,000 and a subsequent payment of $50,000, Fred Queer '49 established an endowed scholarship fund to support undergraduate students who demonstrate strong potential for success.

Patrick J. Early '55 made a gift of $25,000 just before his untimely death in May. As he did every year, he directed his gift to the Engineering Senior Design Endowed Fund with a generous gift of $100,000. The Fund helps support projects in the Engineering Senior Design course.

John Wright '69 made his annual Guggenheim Society level each year since the Society's inception in 1925. Wright's gift was to triple the fund by offering to match contributions dollar for dollar up to $25,000. Wright was pleased to submit a check for $25,000 in June 2003 and thanks the Mines community for their role in making it possible.

Robert Maytag donated $261,429 to Mines. He made a gift of $25,000 to the McKee Family Endowed Scholarship. The scholarship honors Mrs. William A. Preston '58, who served in the U.S. Mint from 1942 to 1945. She was active much of his life in the Boy Scouts of America and was an Eagle Scout and a Brotherhood member of the Order of the Arrow. He was a lifelong member of the Grace Episcopal Church.

Denver Aug. 7 from complications of pneumonia. He was 88. The son and grandson of miners, Frost also pursued a career in mining and metallurgy. He operated the Hlawatha Gold Mine in Cripple Creek from 1939 to 1942 and worked for the U.S. Army from 1942-1945. From 1945-1952 he was chief engineer for the Denver Equipment Company and supervised construction of the mill at the Pride of the West Mine. He also consulted on mining and milling operations in Mexico and Peru. He patented a new method for froth flotation and concentration of sulfide ores. He became a professor of metallurgy at the U.S. Mining and Metallurgical Program.

In Memoriam

FRANK "RED" AUSANKA PE '42

AUSANKA PE '42 died at his home in Santa Barbara, Calif., May 4. He was 89. After graduation, Ausanka served in the U.S. Army Corps of Engineers in Burma during World War II. He was retired from active duty in 1946, and made his annual Guggenheim Society level each year since the Society's inception in 1925. Wright's gift was to triple the fund by offering to match contributions dollar for dollar up to $25,000. Wright was pleased to submit a check for $25,000 in June 2003, and thanks the Mines community for their role in making it possible.

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FRANK "RED" AUSANKA PE '42

AUSANKA PE '42 died at his home in Santa Barbara, Calif., May 4. He was 89. After graduation, Ausanka served in the U.S. Army Corps of Engineers in Burma during World War II. He was retired from active duty in 1946, and made his annual Guggenheim Society level each year since the Society's inception in 1925. Wright's gift was to triple the fund by offering to match contributions dollar for dollar up to $25,000. Wright was pleased to submit a check for $25,000 in June 2003, and thanks the Mines community for their role in making it possible.

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In memoriam

STEVEN M. GRAVER PE ’82 died in a plane crash Sept. 2, 2002. The crash was the result of engine failure during takeoff in his Beechcraft Bonanza. Graver’s entire family and two survivors were in the plane and there were no survivors. After struggling through Mines for over six years, Graver graduated with the proud accomplishment of receiving the Tippie & Vaughn scholarship for those that showed potential but not necessarily academic excellence. In 1983, Graver married Julie Coyle from Charleston, W.Va. They spent the next 20 years following the oil fields in Texas, Louisiana, Syria, Venezuela and Scotland while raising a family and pursuing their passions for water skiing and flying. They raised three active girls who enjoyed music, water skiing, dance and flying: Amanda, 15, Sarah, 13, Elizabeth, 13. At the time of their deaths, they resided in Lafayette, La. Graver was vice president and general manager of the North American unit for ENSCO International Inc. His professional activities included SPE, International Association of Drilling Contractors, American Petroleum Institute, Global Drilling Safety Leadership Initiative and his local chamber of commerce. Graver’s positive “can-do” and supportive attitude touched many people through the oil industry. His friends and colleagues established a Mines scholarship in his honor. Graver is survived by his parents, Henry PE ’57 and Jan Graver, a sister and brother, a nephew, two nieces and a grandmother.

JAMES DONALD MULRYAN EM ’54 died May 20 in Littleton, Colo. He was 74. That day, SME lost a distinguished and dedicated member. Mulryan was an honor high school student and a participant in football and basketball. He was a Phi Kappa Sigma fraternity and the Society of Mining Engineers. In 1998, he married Marie Gilmore, a schoolteacher. He worked as a management consultant with Westinghouse, Kelly, Davenport and Toole, a partner in Neff, Naitys and Witherspoon and successor firms, retiring in 2000. He was a life member and longtime secretary of the Northwest Mining Association. He was also an active member of M Anitas United Methodist Church and several other organizations. Mulryan is survived by his wife of nearly 50 years, Barbara, four daughters, five grandchildren and two step-grandchildren.

JENNIFER B. SMITH EM ’69 died on April 30 in Littleton, Colo. She was 52. Smith was a private practice pediatrician. Smith was the proud mother of two children and a step-grandson and step-granddaughter.

WILLIAM H. THORNE MSc Min ’64 died on April 16 at his home in Anchorage, Alaska. He was 86. Thorner was a mining engineer born in Charleston, W.Va. He graduated from UW law school in 1958 and spent two years in the U.S. Army Counter Intelligence Corps. He was an engineer in offshore drilling and later in platform design. He worked in the North Sea and the Gulf of Mexico. In 1992, Walthal was diagnosed with Parkinson’s disease and retired. He is survived by one daughter and two sons. "Sam was the embodiment of CSM in that he believed that there was no problem too great to solve or you worked at it intelligently and tenaciously," says friend H. Joe Boyd PE ’63, M Sc PE ’69. "It was that attitude that brought him considerable national recognition as an offshore drilling engineer on both platforms and drillships.”
40 MINES FALL 2003
COLORADO SCHOOL OF MINES

climb to Spiller Creek. Nearly out of energy continued forcing a route through heavy over timbered slopes. After lunch, we face to descend, then bushwhacked north our way along a ledge on the vertical cliff discernable trail. We cautiously worked bags. Next morning we began the steady hastened our retreat to warm sleeping fettuccine before dropping temperatures enjoyed ramen noodles and freeze-dry sunny for the trek to Steelhead Lake our expedition was Bill Elliott. brothers at Mines. The fourth member of had been roommates and fraternity finally, it was a reality. John, Dave, and I backpacking in the High Sierras. Now, Mines next year. granddaughter, Jennifer M.

Sierra Nevada Rendezvous By John Sulzbach EM ’56 For years, Dave Mann EM ’56 and I had talked! John Blumger PE ’56 to high backtracking in the High Sierras. Now, finally, it was real. John, Dave, and I had been roommates and frad with no brothers at Mines. The four member of our expedition was Bill Elliot In the morning we were awakened by calls of white-tailed ptarmigan. Bill calls of white-tailed ptarmigan. Bill produced a flask of bourbon to sun set. Our mood was further enhanced splashed across the creek in our boots and fell. acres to the right of a stone wall. The trail was well defined at a small lake. We woke to a frosty morning. The with high spirits we hustled to wash up

John B. Michael Morgan BSc Eng ’88

Larry Hoppe is an independent consultant in Nica, Wash.

British Columbia. We carefully descended a steep ledge that was over and around rocky slabs. We created a clear cut for lunch before resuming our ascent. The low point on the jagged ridge was 11,350 feet but offered no obvious way down. It looked hopelessly steep. Dave and I explored the creek, eventual route we convinced ourselves was doable. We carefully descended a steep ledge that sloped in toward the ridge. At first we had to remove our packs and lower them by rope and then ledgered a eight-foot vertical break, but eventually we reached the bottom and picked our way through the talus and outcrops to a small lake. We delved on a ledge on the vertical cliff face to descend, then bushwhacked north over timbered slopes. After lunch, we continued forcing a route through heavy timber on steep slope before making the climb to Spiller Creek. Nearly out of energy and sunlight, we finally managed camp. Day three we were challenged by a long ascent up steep switchbacks with two dayhikes. This led to two summits, then another long climb before dropping down and joining the trail of a major trail junction. Over a streamside lunch we decided to continue up the valley with the likelihood of large talus covered trails. The trail was well defined at a gentle grade, so we hiked steadily for over two hours before reaching 9,200 feet. Dave and Bill fished, John birded, and looked for artifacts until dusk. Bundled we enjoyed dinner around a campfire. We awoke to a frosty morning. The valley opened before us as we climbed toward the craggy summits of Sawtooth Ridge. Snowfields on the northern slopes fed melt streams that crossed our trail. The grade was reasonable, but after two hours, we left the trail and headed east to the icy headwaters of Matterhorn Creek, where we began an exhausting ascent. We chose each own path through grass and low shrubs, over and around rocky slabs. We created a clear cut for lunch before resuming our ascent. The low point on the jagged ridge was 11,350 feet but offered no obvious way down. It looked hopelessly steep. Dave and I explored the creek, eventual route we convinced ourselves was doable. We carefully descended a steep ledge that sloped in toward the ridge. At first we had to remove our packs and lower them by rope and then ledgered a eight-foot vertical break, but eventually we reached the bottom and picked our way through the talus and outcrops to a small lake. We delved on a ledge on the vertical cliff face to descend, then bushwhacked north over timbered slopes. After lunch, we continued forcing a route through heavy timber on steep slope before making the climb to Spiller Creek. Nearly out of energy and sunlight, we finally managed camp. Day three we were challenged by a long ascent up steep switchbacks with two dayhikes. This led to two summits, then another long climb before dropping down and joining the trail of a major trail junction. 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Stamp mills were used to crush ore into a fine enough grind so that precious metals could be liberated. Stamp mills were a significant improvement overarraids that had been used since antiquity to grind ore. Stamp mills were used in China, not just to crush ore, but for crushing and milling rice. In Europe, stamp mills first appeared in the Middle Ages. By the Renaissance, stamp mills were well established in mining and milling operations in Germany and Bohemia.

A stamp mill is made up of pesas or stamps lifted by a cam from a power source, usually water or steam, but sometimes animal or human power. Once a pestle is lifted to a set height, it is dropped on ore placed below it. Each stamp assembly, with steam, tappet, bosshead and shoe, weighed between 500 and 1,300 pounds. The sheer weight and force of the stamp assembly falling crush the ore. The assemblage of pesas used to stamp the ore were called a battery, usually three to five stamp per battery. As ore was crushed, water discharged it through screens onto copper amalgamation plates. Mercury painted on the cooper-acted the gold or silver forming an amalgam that could later be recovered through a reprocessing. Heating the amalgam during the reprocessing vaporized mercury, which could then be condensed back into liquid form for use again, leaving the gold or silver.

The German stamp mill was adopted in Britain and became known there as the Cornish gravitation stamp mill. It eventually found its way to the United States and was first used in 1829 in the Georgia Gold Rush and later in mines in Virginia and the Carolinas. When the 1849 California Gold Rush began, stamp mills soon followed. The first California stamp mills had wooden shafts and soft iron shoes and proved to be inefficient. Fortunately, all manner of people had flocked to California to seek their fortunes, including "tinker mechanics." These mechanically inclined miners instituted a number of innovative design changes including iron instead of wooden stamper, cast iron instead of soft iron shoes, round shoes instead of square, and using curved tangential cans instead of straight ones. The California stamp mill or Quartz Mill III as it sometimes was called was developed from practical experience in the California gold fields. It became the model used around the world as the standard ore-crushing machine. Even the Cornish eventually adopted it in the late 19th century after a great deal of resistance. Wherever it was used, the basic design was the same. The only differences were the weight of the shoes on the stamp, the distance the shoes fell to the anvil, and the number in which the stamps fell after being lifted. Most stamp mill batteries were made from heavy timber, but iron or steel frames are also found. Although stamp mills were heavy, they could be transported disassembled to a mining site and easily reassembled. They were used well into the 20th century but were eventually replaced by ball mills. Today only a few working stamp mills and working models survive in museums or as rusted ruins at old mining sites.

CSM’s model is a California-style stamp mill manufactured by the Thomas Mining Machinery Company Ltd., around 1890. The model is about 4 feet tall, 2 feet wide and 4 feet long, built to a scale of 8 to 1. Two batteries of pesas are on the mill. To a battery, make 10 stamps in all. The order in which the stamps fall varies by region and is determined by the type of ore being crushed. With this particular model the order is 1:3:5-2. This order was known as the homestead sequence in the United States and was also commonly used in South African mines. Because the model has a stamp order used in South Africa it may have been manufactured as a working model made for export to that country where the British had extensive mining interests. It is likely the model was used in explorations and trade shows where the Thomas Mining Machinery Company tried to sell its stamp mills throughout the British Empire. How it got to Buena Vista, Colo., is a mystery. Fortunately it did and was preserved until it could be donated to the Archive.

By Robert Sorgenfrei
At the 2003 Celebration of Mines, students enjoyed the last cotton candy days of summer.