

Harveys Endow \$10 Million Scholarship


Is Algae the Future of Biofuel?



Summer 2009 Volume 99 Number 2

Mines

Colorado School of Mines Magazine



Climbing Mt. McKinley

Cool off with this intriguing adventure.

conscientious

sometimes what you don't see
makes all the difference in the world



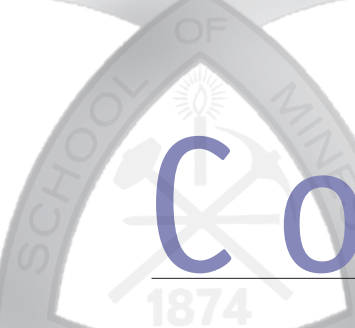
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Hugh and Michelle Harvey gave Colorado School of Mines \$10 million this spring to endow a scholarship program. The venture that made the Harveys' gift possible, Intrepid Potash, didn't exist 10 years ago. The Harveys' story is one of bold entrepreneurship, collaboration, innovation and open-handed generosity.

20 A Bold Ascent

Equipped with guts and common sense (but minimal mountaineering experience) three young Miners and their friends attempted to climb Mt. McKinley last summer. By choosing the little-climbed Muldrow Glacier route, they took on a grueling 26-day, 170-mile slog with packs that weighed 150 pounds on day one.

24 Great Green Greasy Algae

Algae give us much of the air we breathe. They are the foundation of most aquatic food chains. They are integral to soils everywhere. As solar collectors, they provide a big chunk of the energy budget for life on Earth. So can bio-scientists put them to work to underwrite the energy budget of modern civilization?

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Generous Supporters

Editor's note: Thank you to all who responded to the request for financial support for the magazine. We appreciate your gifts and the kind words that accompanied them.

Betty and I noted the *Mines* magazine Appeal, which you included in your introductory letter to the spring edition of *Mines*. We value the quality and content of *Mines* greatly and we always look forward to learning and being inspired by the *Mines* stories. We are keen to see *Mines* continue to produce its outstanding journalistic product into the future, and we recognize that the School of Mines' scope and portfolio is expanding technologically as well as geographically and geopolitically. This expanding scope/reach and the difficult economic time pose a challenge to *Mines* magazine, which I am confident you will overcome with distinction.

We are pleased to respond to the *Mines* magazine Appeal with a contribution of \$500. I am sure that other grateful alumni will respond as their means allow, ensuring that *Mines* magazine remains a positive differentiator in a globalized economy that is moving at light speed.

We wish you and your team continued success, and we are ready to join other alumni in supporting future funding augmentation efforts for *Mines* magazine.

Ralph and Betty Peterson (Ralph is retired CEO and current chairman of CH2M Hill. He was awarded an honorary doctor of engineering degree in 2000, and now serves on Mines' Advisory Board.)

I enjoy the magazine very much and I still have friends at CSM. Good luck.

Joe Savage '91

Thank you for a fabulous magazine. It's much improved...

Sincerely,
Mary Ann Sherrie (former employee of OIA)



Keep up the good work. The *Mines* magazine has really improved.

Jeff Bell '64

I am enclosing a check in support of the *Mines* magazine. I want you to know how appreciative I am that you continue to send the magazine to me – even after my husband's death. Thank you.

Betty Badini (widow of Alves Badini '58)

The Spring 2009 issue of *Mines* magazine was certainly filled with several inspiring articles, as all *Mines* magazine are! My husband, George, is an alumnus, and I briefly worked at CSM years ago. ... I was raised in Golden and especially enjoyed the article by Mr. Baroch about Golden's 150th anniversary celebration. Thank you for including the achievements of all the gentlemen in the Passing pages, which were inspiring as well. I remember going into Plummer's Jewelry store when I was a kid and enjoyed reading about Mr. Plummer. And, Chuck Russell was instrumental in initially helping the Houston Golf Tournament Committee. The other articles in the magazine are encouraging, inspiring and impressive. Keep up the good work and thank you for publishing the *Mines* magazine.

Barbara Puls (wife of George Puls III '74)

I've been a member of CSMAA since 1947 and a coasting-along-non-paying status for a long time. It's my pleasure to respond to your appeal for support for *Mines* magazine. It's also an opportunity to comment on your editorial. After the article "Writing" in the winter edition of *Mines* and the many letters it generated, it is regrettable that you fell into that trap of using the spelling of the heavy metal instead of the past tense of the verb to lead.

Gerry Gould '47

Editor's note: Regrettable indeed.

Contributors



Kirsten Boyer is a freelance portrait photographer living in Boulder, Colo. (Photography: "Great Green Greasy Algae")



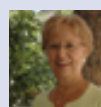
Anne Button is a principal at Effect Communications in Denver, Colo. She consults with and writes for higher-education institutions. (Lees and Chuber/Dumesnil profiles)



Oliver Dewey is an undergraduate at Mines who works part time for CSMAA. He assists with Passings and numerous magazine-related projects.



Jeff Duggan has served as *Mines'* sports information director for five years. In addition to providing all communications for the Athletics Department, he writes content for Scoreboard.



Jeannie Jacobson, who assists with copy editing the magazine, has worked for University Advancement (formerly OIA) in Corporate and Foundation Relations since 2001.



Trisha Bentz Kendall is associate director of communications for University Advancement, where she has worked since 2005. In addition to contributing to Investing, she spends nights and weekends writing Inside Mines, administering the website, and assisting with editing and copy editing.



Craig Korn, art director for *Mines*, is a freelance graphic designer based in Denver. He has worked on the magazine since helping with the redesign in early 2007.



Lisa Marshall is freelance journalist and mother of four who lives in Estes Park, Colo. ("A Bold Ascent")



Todd Neff, former science and environment writer for Boulder's Daily Camera, is a freelance writer based in Denver. (Spotlight: Christian Shorey)



Chris Peters, an undergraduate student at Mines, owns and operates Peters Photography. His work is found throughout this magazine.



Erica Siemers has served as director of communications for University Advancement since 2005. In this issue, she worked closely with Marsha Williams on "Paying it Forward."



Nick Sutcliffe is editor of *Mines* magazine and director of communications for the alumni association. A lecturer for LAIS 1999 – 2001, he subsequently worked for OIA in communications, before taking up his current position in early 2007.



Marsha Williams, director of integrated marketing communications for the school, has worked in public relations since 1998—she has contributed to *Mines* on numerous occasions during that time. ("Paying it Forward")



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Dear Readers,



It's coming up on 10 pm and the magazine goes to press tomorrow morning. I haven't left the building before 10 one day this week; and last week was much the same. Nevertheless, I think this is one of the best jobs on campus.

Let me explain. Condensed, the editor's job description might read, "Go out and find the most interesting people and stories you can, and write about them." This might be a challenge if Mines didn't attract so many talented and extraordinary people. As it is, my job is endlessly fascinating and inspiring.

Take, for example, Ryan Ford '07, Thomas Wells '07, MS '08 and Ryan Plieness '09 who assembled a Mt. McKinley expedition with three young men from Alaska in spring 2008. With very little mountaineering experience, these young men took on a formidable challenge, overcoming numerous obstacles in pursuit of a lofty goal. I was extremely impressed, and you will be too if you take the time to read "A Bold Ascent," by Lisa Marshall.

In "Paying it Forward," by Marsha Williams, we bring you the story behind the largest endowment gift ever created at the Colorado School of Mines. In addition to outlining the scholarship established by Hugh and Michelle Harvey's \$10 million endowment, this story chronicles Harvey's '74, MS '80 career, and the moment of creative inspiration that helped give rise to the largest potash mining company in the U.S.

Another example of the extraordinary is offered in "Great Green Greasy Algae," which takes a look at the potential of algae to generate biofuel. Matthew Posewitz, assistant professor of chemistry and geochemistry, has earned a national reputation for pioneering research in this field—in particular algal hydrogen production. I interviewed Posewitz before writing the story and came away staggered by the complexity of his work, enormously impressed by the progress made, and optimistic about the future of algal-biofuels.

I hope you enjoy these, and the many other remarkable stories collected in this issue of *Mines*. I'm always looking for more, so please get in touch if you have any tips. You can email me at magazine@mines.edu.

I'd like to end by thanking those who responded to the special appeal in the spring issue. As noted on the facing page, your generosity is deeply appreciated. If you didn't contribute or simply forgot, it's not too late. You can give online at <http://minesonline.net> by selecting the *Mines* magazine tab. Alternatively, mail your check, payable to "CSMAA – *Mines* magazine special appeal," to CSM Alumni Association, Dept 1947, Denver, CO 80291-1947. Your support will be much appreciated.

Best wishes for the rest of summer,

Nick Sutcliffe
Editor and Director of Communications, CSMAA

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

Comments and suggestions are welcome. Contact us by writing to *Mines* magazine, P.O. Box 1410, Golden, CO 80402; or call 303.273.3294 or 800.446.9488, ext. 3294 between 8 a.m. and 5 p.m. M-F, MST; or email magazine@mines.edu.

Visit the *Mines* magazine website at
www.mines.edu/magazine

Campus News



Commencement 2009

Excited students, proud families and friends gathered May 8 on Kafadar Commons for Mines' 135th Commencement. President Bill Scoggins welcomed visitors to the ceremony at which over 650 members of the Class of 2009 received their degrees.

Donald Paul, executive director of the University of Southern California's Energy Institute and the William M. Keck Chair in Energy Resources at USC, opened with an encouraging address about the next phase of life: "... your years at Mines have provisioned you well for this journey ... As with all Mines graduates who have come before, your class has the opportunity—and I would claim the obligation—to build sustainable lives and careers ... and to positively and constructively advance our societies." Paul, an MIT alumnus, retired in 2008 after a distinguished career at Chevron. During Commencement, he was awarded an Honorary Doctorate of Engineering.

In addition, the school awarded four Distinguished Achievement Medals.

Bruce M. Clemens '78: professor of photon sciences, Stanford University
Synchrotron Radiation Lab

M. Stephen Enders '76: director, Renaissance Resource Partners

Mari Angeles Major-Sosias '85, MS '92: strategy director—North American division, AREVA

Tom Vander Ark '81: managing partner, Revolution Learning; partner, Vander Ark/Ratcliff

Graduating senior Zachary Aman remarked on how Mines has prepared him and his classmates to make a difference: "In choosing to attend this institution, we



selected an arduous course, and are today the better for it ... We have the ability to truly comprehend the complexity of the world around us and, as Mines engineers, we have the potential to change it.”

Although this year’s graduates are entering a weak job market, they are still in high demand. Placement rates are on



par with the school’s 20-year average and 13 percent higher than the reported national average for engineers. More than 130 recruiters are registered for Fall Career Day, and 69 companies are already scheduled for fall campus interviews.

New Summer Program Engages Students in Renewable Energy Research

Twenty outstanding undergraduate students from Mines and other universities around the world are spending their summer on campus as part of the new 10-week Research Experience for Undergraduates (REU) program. The intensive program teams talented students with faculty from diverse fields at Mines to explore cutting-edge renewable energy research topics.

REU participants receive a \$4,500 stipend, attend scientific seminars, and tour private companies and government labs involved in alternative energy technologies. The program culminates in August with student presentations, and later in the fall participants will present their results at a national conference. Mines’ Renewable Energy Materials Research Science and Engineering Center (REMRSEC) is hosting the hands-on, interdisciplinary session.

REU brings students from an array of majors together to partner on three research areas: next generation photovoltaics, advanced membranes for energy applications and energy storage systems.

“Mines students can make a real difference in our world’s renewable energy needs,” said Chuck Stone, REU director.

Mines sophomore Lydia Gerber and Syracuse junior Grace Conklin are working on creating fuel cell membranes. Conklin, an environmental engineering major, finds the real-world application of her summer research fascinating, saying, “the opportunity to work with renewable energy is like a dream come true, and I’m interested in the impacts of these developments.” Chemical engineering major Gerber says she is most excited about working with new people. “Not many students get a chance like this,” she says, “and I’m networking with fellow REU students and learning more every day.”



Left to right: David Banville (Canada), Jonathan Guerrette (Colby College), Andrea Yocom (CSM), Cameron Brown (MIT), Charlotte Perfetti (France), Jennifer Smith (Georgia Tech), Louis Gerstenberger (CSM), Lydia Gerber (CSM), Cameron Frisby (CSM), Joanna Haag (CSM), Kory Risky (CSM), Grace Conklin (Syracuse), Lewis Patterson (CSM)

Charlotte Perfetti came to Mines from the Engineering School of Mines in Albi in the south of France. She knows she’d like to specialize in energy, so REU is a great opportunity to discover some options and to gain practical experience. “In choosing to spend my summer here,” she says, “I’m learning how the research world works. I’ve found out that you need to be very patient and have a lot of passion.”



New Provost and Executive Vice President Appointed

Steven P. Castillo began his appointment as Mines' provost and executive vice president on July 1. Castillo came to Mines from New Mexico State University, where he was a member of the faculty since 1987, and dean of engineering since 2004.

"Mines' excellence in science and engineering education and research, and its established reputation were very compelling," Castillo said. "Add its burgeoning research portfolio in both the extractive industries and areas vital to the national agenda in sustainability, and I found myself with a unique opportunity."

The provost is the chief academic officer and second-ranking administrative position. Castillo is charged with helping to define Mines' academic vision, coordinating academic program development and faculty research, and spearheading efforts to ensure campus diversity—all while staying focused on the school's strategic goals.

Castillo is looking forward to the challenge. "With its small size and well-defined mission, I know I will be closely involved with the school's strategic objectives for continued excellence across the board," he said. "The most challenging part of this position is to continue the institution's increasing success in the face of an uncertain budget picture in Colorado."

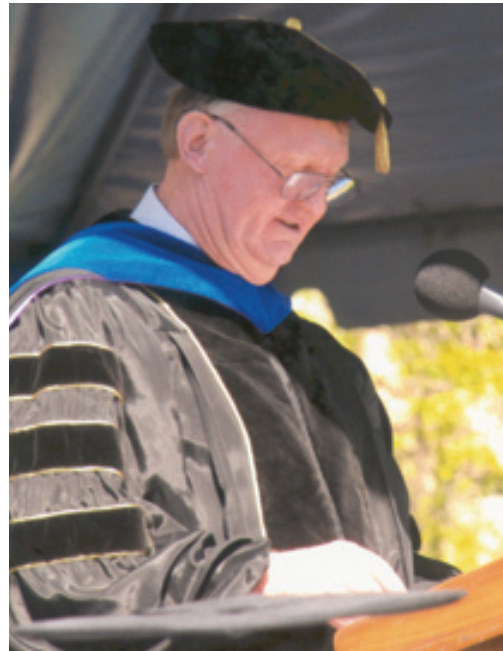
Nigel Middleton, the school's chief academic officer and dean of faculty since 2001, recently took up his new position as senior vice president for strategic enterprises.

VP of Student Life and Dean of Students Harold Chevront Retires After 30 Years

After three decades of service, Harold Chevront retired this spring. It is difficult to sum up the accomplishments of this passionate administrator, who helped put into place so many transformative campus initiatives. His impact can be seen across campus, from improvements to facilities, to advances in athletics, to the invigoration of student life and culture.

Chevront began his tenure at Mines as registrar in 1981, taking on the position of vice president of student life and dean of students in 1989. Colleagues describe him as a big-picture person, an advocate for students and a capable leader. Bill Young, retired admissions director, recalls Chevront's ability to foster change by looking at the school as a dynamic whole: "Harold understood that the social and cultural aspects of student life were critical to meeting academic and financial goals." Young added, "It was a classic case of doing well by doing good, and in the process, Harold changed the institution."

Marv Kay, a longtime colleague and the retired athletics director, describes Chevront as a persistent, hard-working leader with a clear vision. "He had a rare combination of foresight and the ability to compile the resources and support needed to get the job done," he said. Kay credits Chevront with



nurturing a cultural shift as well: "He was instrumental in changing Mines from a normal, tough engineering school, to one that's a normal, tough engineering school that cares—and that's made a real difference." Chevront helped shepherd countless students through the Mines experience—from the admissions process to helping launch careers. President Emeritus John Trefny said, "My single most outstanding memory will be his putting students first."

Dan Fox, the new vice president of student life, said, "Harold cast a pretty wide shadow. He truly loved working with young people. He saw them as our collective future and was dedicated to making their experience at Mines as meaningful as possible."

The Mines community will continue to feel Chevront's impact in the years ahead, as Young expressed in his retirement tribute: "The best any of us can hope for in our time with the institution is to do our job well, try to leave the institution better than when we came, and if we're lucky, create a legacy that will endure. Well, Harold, you've done that in spades, and you've been a force on this campus."

Mines is First American University to Teach Courses in Libya in More Than 30 Years

Colorado School of Mines taught a weeklong petroleum engineering course in Libya this June, becoming the first American university to do so in more than three decades.

The program was sponsored by Mines' Special Programs and Continuing Education Office. Gary Baughman, SPACE director, and Craig Van Kirk, professor of petroleum engineering, traveled to Tripoli to share the school's expertise with national and international oil companies and government officials, and to identify ways Mines may provide such training in the future. They met with key industry and government representatives, and Van Kirk taught a course on effective reservoir management practices.

"Libya has phenomenal potential to again be a global petroleum provider," says Baughman, "and the Mines community is uniquely positioned to provide educational programs that are the best in the world."

Their visit was arranged by Libyan-American businessman Tamim Baiou, who proposed the idea two years ago. Baiou's Libyan company, Alrakiza Training, saw the need and worked through the diplomatic channels necessary to realize this opportunity.

"We were warmly welcomed by industry and government leaders, and enjoyed renewing contacts with Mines alumni and associates," said Van Kirk. "The experience underscored the significant need for this partnership to improve petroleum management and production in the region."

The visit laid the groundwork for an exciting new outreach



Gary Baughman (left) and Craig Van Kirk (right) with the U.S. ambassador to Libya, Gene Cretz, and his wife, Annette. Cretz is the first U.S. ambassador to Libya in 36 years.



Gary Baughman (left) and Craig Van Kirk at the ruins of Leptis Magna, near Tripoli, Libya.

opportunity for Mines, and plans are already under way for additional programs, both in Libya and on campus. Many industry and government dignitaries, including Gene Cretz, the first U.S. ambassador to Libya in 36 years, attended a reception hosted by Alrakiza.

Baiou noted, "The positive feedback and interest from the Libyan petroleum sector has been overwhelming, and the presence of Mines' celebrated expertise and faculty provides the basis for a very successful joint program." Libya's economy depends on oil sector revenues for 95 percent of export earnings, 25 percent of GDP and more than half of public sector wages, according to U.S. government statistics.

In Brief...

Debra Lasich, executive director of Mines' Women in Science Engineering and Mathematics program, has been awarded the Women in Engineering ProActive Network's University Change Agent Award.

André Revil, associate professor of geophysics, has been appointed editor of the *Journal of Geophysical Research—Solid Earth* by the American Geophysical Union.

Environmental science and engineering PhD student **Heather Pace** won a Fulbright Postgraduate fellowship to undertake research with the CSIRO Niche Manufacturing Flagship.

In March **Carl Mitcham**, LAIS professor, presented the European Commission Expert Group of the Global Governance of Science's report on the future of the EU in Riga, Latvia. Available at <http://bookshop.europa.eu/eubookshop>.

David R. Pyles, technical research project manager for the Chevron Center of Research Excellence and research professor in the Department of Geology and Geological Engineering, received the J.C. "Cam" Sproule Memorial Award for two papers published in the *AAPG Studies in Geology 56: Atlas of Deep-Water Outcrops*, 2007.

Brajendra Mishra and **John J. Moore**, associate head and head of the Department of Metallurgical and Materials Engineering, received awards from the Minerals, Metals and Materials Society of the American Institute of Mining, Metallurgical and Petroleum Engineers. Mishra received the 2010 Alexander Scott Distinguished Service Award, and Moore received the Educator Award.

Burke Fort, director of Mines' 8th Continent Project, was appointed to Gov. Bill Ritter's Small Business Council—a group tasked with recommending regulatory changes that encourage small business growth in Colorado.

Investing in Mines

An investment in knowledge always pays the best interest.

—Benjamin Franklin

Harold Korell and Southwestern Energy Company Pledge \$2.5 Million



Harold '68 and Patricia Korell and Southwestern Energy Company have pledged a total of \$2.5 million to support the construction of Marquez Hall, the future home of the Petroleum Engineering Department. Their combined gift brings the school to within \$500,000 of its fundraising goal for the \$25 million interdisciplinary teaching and research facility.

Southwestern Energy Company made a \$1.25 million commitment in honor of Korell, their recently retired chief executive officer who is now executive chairman of the board. The Korells have pledged to match the company's contribution with their own \$1.25 million gift.

"These generous gifts from Harold and Pat Korell and Southwestern Energy will help us to extend our leadership in energy education and research," said Mines President Bill Scoggins. "Such support from corporate and alumni partners is critical to creating the campus infrastructure we need to keep our students and faculty at the forefront of innovation."

Korell graduated from Mines in 1968 with a professional degree in chemical and petroleum refining engineering. The school awarded him a Distinguished Achievement Medal in 2004, and in 2008 he was appointed to the Colorado School of Mines Foundation Board of Governors. In addition to this recent investment in Marquez Hall, the Korells are members of the Mines Century Society and have made significant contributions to support the Student Recreation Center, student scholarships and The Mines Fund.

"We have been so fortunate, both as a family and as a company, and it is a real pleasure to give back to an institution that not only helped me along the way, but is one of the finest schools in the country when it comes to educating our young people about energy," said Korell.

Support for Mines Climbs Higher in 2009

More than 3,800 alumni, friends, foundation and corporate partners contributed over \$30 million to the Colorado School of Mines Foundation during the fiscal year ending June 30. It was the most successful fundraising year ever for the school—especially positive news considering recent financial market instability. Including the Hugh and Michelle Harvey Family Foundation’s record \$10 million endowment gift, Mines supporters directed a total of \$13 million to scholarships and student support. Corporate and individual donors made gifts and commitments of more than \$8 million toward construction of Marquez Hall, one of the school’s top capital funding priorities. Additional philanthropic investment went to The Mines Fund, academic programs, Arthur Lakes Library, faculty support, research, athletics and the school’s physical plant.

“The outstanding level of support we have received over the past year underscores Mines’ distinct relevance in today’s world. Our contributors understand the indispensable role Mines plays in developing the intellectual capital needed to advance our economy and improve quality of life,” said Molly Williams, vice president for university advancement.

Depending on how long the economy takes to recover, Williams expects a challenging fundraising environment in the year ahead. However, she anticipates that Mines will remain a philanthropic priority for donors. “By sustaining strong support for Mines, our donors truly have a hand in shaping the world for coming generations.”



Hugh and Michelle Harvey Family Foundation gives \$10 million, largest endowment gift in school history; Southwestern Energy Company, and Harold and Patricia Korell pledge \$2.5 million to Mines; Other recent gifts

Colorado School of Mines recently received four large gifts:

With a transformative \$10 million gift, the largest gift to endowment in school history, made through their family foundation, **Hugh, Jr. '74, MS '80** and **Michelle Harvey** established the Harvey Scholars Program Endowment Fund. More than just a full-tuition scholarship, the Harvey Scholars Program empowers students by providing opportunities to expand their knowledge of the broader world through enrichment grants, professional development opportunities, funding for a semester of study abroad, and faculty mentorship. Hugh, Michelle and the board of directors of the Harvey Foundation seek to enhance Mr. Harvey’s alma mater and help further Mines’ strategic goals by providing resources to compete for the best, brightest and most promising students, and to encourage participants to become well-rounded persons and active citizens.

Harold M. '68 and **Patricia M. Korell**, along with **Southwestern Energy Company**, have each committed \$1.25 million to support the new petroleum engineering building, Marquez Hall, bringing Mines to within \$500,000 of its fundraising goal for the \$25 million facility. Korell is Southwestern’s former chairman and chief executive officer, and is current executive chairman of the board.

BHP Billiton Ltd. continued its support of the school with a \$100,000 payment on the company’s \$500,000 pledge to the Marquez Hall project and a \$35,000 contribution to geophysics research at Mines.

Newmont Mining Corporation contributed \$110,000 in continuing support for the school.

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

Aqua-Aerobic Systems, Inc. continued its support of the Advanced Water Technology Center (AQWATEC) with a \$45,000 gift.

Chevron contributed \$40,000 to support Mines’ partnership with Kazakhstan National Technical University through the company’s University Partnership Program.

Freeport-McMoRan Copper and Gold contributed \$25,000 in continuing support for student scholarships.

Hess Foundation, Inc. made contributions totaling \$55,000 to support geophysics graduate fellowships and the Department of Petroleum Engineering.

Vernon A. “Bud” Isaacs, Jr. '64 contributed \$50,000 toward his \$250,000 commitment to Marquez Hall.

Landmark Graphics Corporation made a \$60,000 contribution in support of graduate student research.

Paul R. Peel contributed historic mining maps valued at \$53,300 to Arthur Lakes Library.

The Society of Exploration Geophysicists (SEG) Foundation contributed \$47,900 toward humanitarian engineering efforts in Honduras involving geophysical research on sustainable water systems and solutions.

The Viola Vestal Coulter Foundation made contributions totaling \$73,500 in support of undergraduate scholarships, graduate fellowships, the Coulter Instructorship in Mineral Economics and the Coulter Health Center.

***Correction:** In the spring issue of *Mines* magazine, we regretfully misspelled Michael G. Long’s name. **Michael G. Long**, a 1972 alumnus, generously contributed \$25,000 in continued support for scholarships through the Michael G. Long Endowed Scholarship Fund.

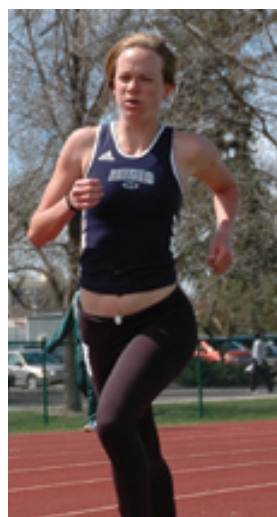
Men's Indoor Track and Field Team Finishes Ninth at National Championships; Relay Team Wins National Title

The Colorado School of Mines men placed ninth at the NCAA Division II Indoor Track and Field National Championships held in Houston, TX in March. The ninth-place finish for the Orediggers marked the eighth top-25 finish for the men at the indoor championships. It was also the highest-ever finish for a Mines team (men or women) at the indoor championships.

The men's distance medley relay team earned All-American honors and captured the school's third-ever NCAA Division II national title in track and field with a time of 9:57.56. The team included Ben Zywicki, Mark Husted, Nick Maynard and Mack McLain.

Individually, the Oredigger men had four top-ten finishes. In the 800m run, Husted earned All-American honors with his fourth-place showing (1:53.70), while Maynard finished ninth (1:57.36). McLain, who was selected as the RMAC Men's Freshman of the Year after winning the mile in a RMAC-record-breaking time of 4:10.80 at the regional championship, garnered All-American accolades with his eighth-place finish (4:14.48) in the mile run. Zywicki earned All-American recognition with his seventh-place finish (14:26.24) in the 5,000m run.

Melanie Peddle, who was named the RMAC Women's Regional Nominee Track Athlete of the Year after winning the 800m and the mile at the 2009 RMAC Indoor Track and Field Championships, earned All-American status by placing sixth in the mile (4:58.23).



Melanie Peddle



Nick Maynard

Mines Athletics Home Schedules

FOOTBALL

Aug. 29	Washburn University	12:00 p.m.
Sept. 19	Fort Lewis	12:00 p.m.
Oct. 10	Western State (<i>Homecoming</i>)	12:00 p.m.
Oct. 24	Chadron State	12:00 p.m.
Nov. 7	N.M. Highlands Univ.	12:00 p.m.

Sept. 15	Chadron State (at Volk Gym)	6:00 p.m.
Sept. 18	Nebraska – Kearney	7:00 p.m.
Oct. 8	Adams State	5:00 p.m.
Oct. 9	Western State	5:00 p.m.
Oct. 10	CSU – Pueblo (at Volk Gym)	6:00 p.m.
Oct. 23	Colorado Christian Univ.	7:00 p.m.
Oct. 24	UC – Colorado Springs	6:00 p.m.

Oct. 25	CSU – Pueblo	12:00 p.m.
Nov. 1	Regis University	2:30 p.m.

VOLLEYBALL

Aug. 27	Fort Lewis	7:00 p.m.
Aug. 28	Western State	3:30 p.m.
Aug. 28	Grand Canyon University	7:30 p.m.
Aug. 29	Minnesota State – Moorhead	3:30 p.m.
Aug. 29	Saint Leo University	7:30 p.m.
Sept. 8	Colorado College	7:00 p.m.
Sept. 11	Metro State	7:00 p.m.
Sept. 12	Regis University	7:00 p.m.

MEN'S SOCCER

Aug. 27	Northwest Nazarene Univ.	4:00 p.m.
Aug. 31	University of Mary	4:00 p.m.
Sept. 27	UC – Colorado Springs	2:30 p.m.
Oct. 4	Metro State	2:30 p.m.
Oct. 11	Colorado Christian Univ.	12:00 p.m.
Oct. 16	Fort Lewis	3:30 p.m.
Oct. 18	Mesa State	12:00 p.m.

WOMEN'S SOCCER

Aug. 28	Washburn University	4:00 p.m.
Aug. 30	Nebraska – Omaha	12:00 p.m.
Sept. 13	N.M. Highlands Univ.	12:00 p.m.
Sept. 27	Mesa State	12:00 p.m.
Oct. 2	UC – Colorado Springs	4:00 p.m.
Oct. 4	Adams State	12:00 p.m.
Oct. 14	Regis University	3:30 p.m.
Oct. 16	Nebraska – Kearney	1:00 p.m.
Oct. 23	CSU – Pueblo	3:00 p.m.
Nov. 1	Colorado Christian Univ.	12:00 p.m.



Women's Basketball Earns Share of 2008-09 RMAC Regular-Season East Division Championship

The women's basketball team went 14-5 in the RMAC in 2008-09 and earned a share of the RMAC East Division Regular-Season Championship. The

Orediggers, who compiled a 19-11 overall record, also made their second appearance in four years at the RMAC Shootout Championship Game in 2008-09.

Mines tied a single-season program record for victories and established a new single-season program record for RMAC victories last winter. Two Orediggers, Emily Dalton (first team) and Brecca Gaffney (second team), garnered All-RMAC honors, while Gaffney and Savannah Afoa both earned recognition on the RMAC Shootout All-Tournament Team. Head Coach Paula Krueger, who was selected as the RMAC East Division Coach of the Year, as well as the RMAC Co-Coach of the Year, is now the all-time winningest coach in the history of the women's basketball program at Mines. In six years at the helm, Krueger has amassed a 94-79 overall record (65-49 RMAC).

Softball Makes First-Ever Appearance in NCAA Tournament; Kocman and Starr Receive All-American Honors

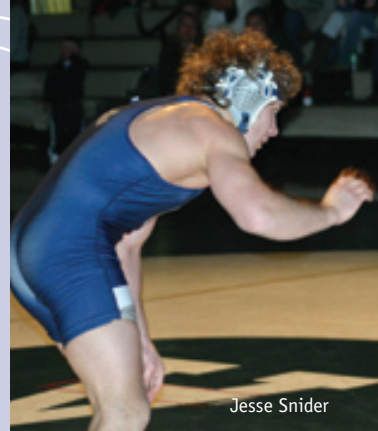
The softball team posted a 39-19 overall record and made its first-ever appearance in the NCAA Division II Tournament in 2009. The Orediggers, who earned a berth as the number three seed in the Central Region bracket, also established single-season program records for victories and conference victories (28) last spring. Furthermore, Katie Kocman and Kaleigh Starr became the school's first-ever softball players to earn All-American recognition. Kocman was a Third Team All-American pick while Starr garnered Honorable Mention All-American accolades.



Katie Kocman

Oredigger News & Notes...

- Two wrestlers, Jesse Snider and Jordan Larsen, placed fourth at the RMAC Championships / NCAA Division II West Regionals and went on to compete at the NCAA



Jesse Snider

Division II National Championships in March. As a team, the Oredigger grapplers were ranked second in the NWCA's 2008-09 NCAA Division II All-Academic Top 20 Teams list.

- The men's and women's cross country teams both earned All-Academic Team honors from the U.S. Track & Field and Cross Country Coaches Association for the 2008 season. Individually, Melanie Peddle and Sydney Laws both earned All-Academic recognition from the USTFCCCA.

- Dale Minschwaneer, playing for the men's basketball team, and Jim Knous, playing golf, both earned RMAC Freshman of the Year honors in 2008-09.



Dale Minschwaneer

- Savannah Afoa (discus), Nick Maynard (800m) and Mack McLain (1,500m) each earned All-American recognition at the 2009 NCAA Division II Outdoor Track and Field Championships.

- Jeff Duggan, Mines' sports information director, was named RMAC's 2009 J.W. Campbell/Con Marshall Sports Information Director of the Year by a vote among all sports information directors in the league. Duggan, who is responsible for the promotion of the 18-sport athletics program at Mines, also won the award in 2003 when he worked in the same capacity at Regis University.

FACULTY

Christian Shorey

Specialty: “**Liberal Science**”

Education

There are a lot of people listening to Christian Shorey.

Last year, more than 900 undergraduate students took his course, Earth and Environmental Systems, and he’s taught about that same number each year since coming to Mines in 2005. And now that the entire course is available as a podcast*, Shorey has hundreds, if not thousands, of people downloading his lectures around the world—he’s heard from grateful listeners in China, Australia, Tanzania, Ireland, England, Scotland, Germany, Norway and South Africa.

Shorey hosts a special sort of classroom experience, as you’ll find out if you take the time to listen to the 63rd podcast, in which the Mines lecturer successfully wrestles 282 years of modern scientific advancement into an hour-and-twelve-minute-long lecture.

“My teaching philosophy is, if I’m fascinated by it, students are fascinated by it,” Shorey says, adding after a moment of hesitation, “Usually.”

Over the course of 23 lectures and weekly labs, Shorey leads his students on a journey from the atom to the mind of Immanuel Kant, whose *Critique of Pure Reason* is studied alongside metamorphic rocks, paleoclimatology, weather and biodiversity, to mention just a few of the survey course’s many topics.

A major goal is for students to understand what he calls the “geological time message.” “The rate of change that we’re seeing is unprecedented,” Shorey says. “Not only for humanity, but the planet.”

Another key message: “The planet is our sole source of resources; it’s our wastebasket and our life-support system,” he says. “So when you start looking at those first two—the resource acquisition and the waste and pollution issues—you need to start thinking about the life-support system more seriously.”

John Humphrey, head of the Department of Geology and Geological Engineering, also teaches the course. He says SYGN101 “is a way for students to look beyond doing homework every day on calculus problems and see the world from a 30,000-foot view rather than through the microscope.”

While Earth and Environmental Systems may dabble in intelligent design and population dynamics, it is a geology course. And Shorey holds a PhD in geology. Fossilized shark teeth and geodes decorate his office walls and bookshelves, along with books on



moon morphology, evolutionary geology, oceanography, genetics, invertebrate zoology and the human consciousness.

Shorey, 40, earned his PhD from the University of Iowa in 2002. His dissertation was based on his computer models simulating the growth of stalagmites. The models incorporated oxygen and carbon isotopes, the aim being to use the climbing daggers of calcium carbonate as data points for the study of climate change. Carbon isotopes hint at what sort of vegetation was on the ground above, and oxygen isotopes can provide clues to surface temperatures.

Climate change remains his forte. But, Shorey says, “I got the PhD with the goal of being able to teach.”

He began the podcasts in 2007, each hour-plus episode recorded in a single take on his office computer. The idea was to level the playing field for international students, but also to help traveling athletes and, as he described it, “slackers who don’t show up.” Slackers pay the price though: The podcasts span more than twice the material Shorey can squeeze into a live, 50-minute lecture.

Shorey, until recently a self-proclaimed “computer idiot,” is putting his internet broadcasting experience to work by creating a presence for Mines on Apple’s iTunesU, an area of the iTunes Store where universities share lectures and presentations. Shorey plans on using the site, which he is developing thanks to a \$5,000 student technology fee grant, for posting high-definition videos focused on field techniques such as soil and water sampling and atmospheric measurements. At the same time, he’s creating broadcast infrastructure for other faculty and staff to use, and he plans on offering a seminar in the fall to teach others how to use it.

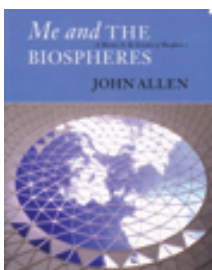
His final podcast of the course was just recently put online. It’s number 65 and is entitled, “The Future.” “It’s a message to my engineers,” he says. “I’ve just told you the problems. Fix them.”

* Find a link to Shorey’s podcast on the *Mines* magazine web site: <http://www.mines.edu/magazine>.



Sustainable Management of Mining Operations

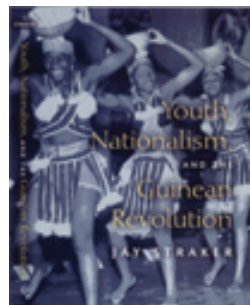
This book is the product of a two-year research initiative led by both Mines and Universidad Politecnica de Madrid (Escuela de Minas), with contributions from twenty-seven different authors. It serves as an all-encompassing guide to the management of mining operations, and provides a practical approach to everything from public relations to planning and costs. Jose A. Botin MS '76, the senior editor and a professor at Universidad Politecnica since 1991, has been a visiting professor with the Division of Economics and Business for the last two years while he worked on the book. He holds a PhD in mine systems from Universidad Politecnica, a master's in mining from Colorado School of Mines and a PADE from Universidad de Navarra (IESE Business School). Publisher: Society for Mining Metallurgy, ISBN-10: 087335267X, ISBN-13: 978-0873352673



Me and the Biospheres

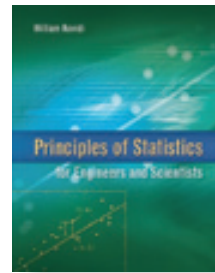
Biosphere 2 is a huge self-contained set of ecosystems occupying about three acres of Arizonan desert. For two years, a group of eight people subsisted on what the Biosphere provided.

This insightful memoir by John Allen '57, inventor of Biosphere 2, comprises not only an account of building and living in the facility, but also the significance of the experiment for space travel. Biosphere 2 set various world records for sustainability, including 100 percent waste and water recycling. Allen holds a degree in metallurgical and materials engineering from Mines, an MBA from Harvard Business School and an engineering physiology certificate from the University of Michigan. Publisher: Synergetic Press, Santa Fe, NM. ISBN: 978-0-907791-37-9



Youth, Nationalism and the Guinean Revolution

Jay Straker, assistant professor of liberal arts and international studies, presents this compelling description of the Guinean Revolution. Weaving together newspapers, photographs, poems, novels, firsthand accounts and more, Straker shows the intricacies of the young nation's politics. The book considers both the short- and long-term effects of the revolution and examines how visions of ideal youth were the true driving force behind Guinea's social and political revolution. Publisher: Indiana University Press, Indianapolis, IN. ISBN-10: 0253220599, ISBN-13: 978-0253220592



Principles of Statistics for Engineers and Scientists

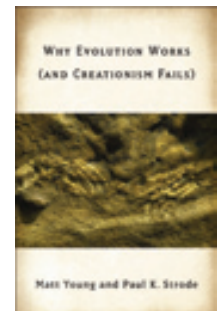
William Navidi, professor of mathematical and computer sciences, wrote this text to support a one-semester course in statistics. The book emphasizes the practical application of statistical methods to problems in science and engineering. While the fundamental principles of statistics apply to all disciplines, students in science and engineering learn best from realistic examples. The book therefore contains many examples of real data sets to motivate students and show connections to industry and scientific research. Thanks to the practical approach, the mathematics only requires a single semester of calculus as a prerequisite. Publisher: McGraw-Hill Science/Engineering/Math, ISBN-10: 0077289315, ISBN-13: 978-0077289317

In-Situ Assembly of Linked Geometrically-Coupled Microdevices

David Marr, professor of chemical engineering, coauthored a study published by the Proceedings of the National Academy of Sciences of the United States that concerns improving the efficiency of bio-analysis of materials such as blood and DNA. The study focuses on tiny chips composed of particles that act as valves and pumps which are activated by a rotating magnetic field. The key is colloidal particles, plastic spheres with a diameter of about five micrometers, which contain iron oxide and can thus be magnetized. While these micro-systems have some way to go, the introduction of colloidal particles is an important step. <http://www.pnas.org/content/early/2008/12/12/0808808105.full.pdf+html>

Model Interstate Water Compact

This book is a proposed solution to the dramatic increase in disputes over interstate water systems seen in the last 20 years. George William Sherk, associate research professor of environmental science and engineering, coauthored the publication, which was sponsored in 2000 by the U.S. Senate Committee on Energy and Natural Resources. The plan encourages states to assume oversight of such interstate resources as water, rather than taking legal action. The document also contains a complete index of current interstate water compacts. Publisher: University of New Mexico Press, ISBN-10: 0826346286, ISBN-13: 978-0826346285



Why Evolution Works (And Creationism Fails)

Matt Young, senior lecturer of physics, recently coauthored this book with Paul Strode, an instructor in the department of ecology and evolutionary biology at the University of Colorado at Boulder. The book is addressed, in part, to those who question such scientific evidence as the antiquity of the Earth and the descent of species. Written with parents, teachers and others in mind, it provides arguments in defense of science—mostly evolution, cosmology and geology. Publisher: Rutgers University Press, ISBN-10: 0813545501, ISBN-13: 978-0813545509



How and why
the Harveys
are investing

\$10 million in Mines

Paying it Forward

By Marsha Williams

When Hugh Harvey '74, MS '80 and John Wright '69, PhD '85 discovered that the youth hostel in Boppard, Germany, had closed its doors for the night, they had no choice but to improvise. They slept on a park-bench-turned-bunk-bed by the side of the Rhine River, Wright on the bench seat and Harvey on the ground below, their excessively heavy, hard-sided suitcases wedged beside them.

It was summer 1973 and the two young men were exploring Europe for the first time. To this day it's one of Harvey's favorite stories about their visit to Europe—an experience that taught him important lessons about self-reliance and exposed him to many different cultures and languages.

Now the opportunity to study abroad is a component of the Harvey Scholars Program established at Mines this spring with a gift of \$10 million from the Hugh and Michelle Harvey Family Foundation. And though Hugh jokes that, thanks to his gift, future Mines students may also get to sleep on park benches around the world, he is particularly enthusiastic about the travel component of the program.

He wants students to learn more about the world around them, and, in the process, more about themselves. He says he wants students to have “the chance to appreciate the complexities of adapting to a different culture, experience the family values of others, manage the complicated logistics of travel in a foreign country, accept differences, adjust to changes, learn to innovate.” And he also wants to give students the opportunity to master a new language.

Clearly, he's not talking tourism—he's talking immersion. Harvey scholars will be encouraged to spend a semester abroad, with an offer to have their travel expenses covered.

In addition to getting the attention of students who already had their sights set on Mines, the Harvey Scholars Program is likely to attract interest from others who have never heard of the school. In fact, Hugh himself first learned about Mines on a construction site in Kayenta, Ariz., where a co-worker, John Kyle, was attending Mines on a Peabody Coal Company scholarship. After Harvey applied and was accepted, it was a Newmont

Mining scholarship that brought his out-of-state tuition within reach.

He hasn't forgotten the gift, and with the scholars program, Harvey and his wife, Michelle, intend to “pay it forward.” Hugh and Michelle are deliberate about using this term: paying back a debt closes a transaction initiated in the past, he points out; paying it forward has more to do with passing along one's good fortune in the hope that the beneficiaries will do the same. “We are looking for opportunities to enrich future generations,” said Harvey.

And they aren't just handing out checks. Michelle is a veteran volunteer and supporter of the Jeffco/Gilpin Court Appointed Special Advocates program, which advocates for children caught up in the court system with dependency and neglect cases. “We've always felt very fortunate to have a strong and bonded family,” says Michelle. “This is my way of paying it forward.”

At this spring's graduation banquet, where the \$10 million gift for the scholars program was first publicly announced, Hugh

echoed these sentiments. Speaking to graduating seniors, he asked them to wind the clock forward many years and consider the legacies they wish to leave behind. "What people remember you for the most may have little to do with what you earned, and much more to do with what you gave away, in some form or another," he said. In keeping with this priority, Harvey scholarship applicants are required to write an essay about the meaning of paying it forward—how they anticipate investing in their communities as they get established in their careers and lives.

Harvey attributes much of his success to his Mines education: a bachelor's in mining and a master's in petroleum engineering. After first graduating in 1974, he spent three years in the mining industry, gradually growing more restless. "I was working in British Columbia at an open pit copper mine, and the workforce went on strike, giving me lots of time to think about my career," said Harvey. His conclusions: Living in an isolated location and overseeing the routine operations of a mine didn't suit his personality; the oil industry, on the other hand, promised considerably more excitement. "Being young and impatient, that had a lot of appeal to me," said Harvey, who returned to Mines for a master's degree in petroleum engineering in 1978.

He might have been looking for more variety and excitement, but he had no intention of striking out on his own. Having grown up watching his self-employed father work all hours of the day and night, year after year, to provide for his family, Harvey wanted a more settled life for himself and his family. However, when the energy industry shrank by 50 percent in the eighties, his plans were derailed. "I found myself self-employed, or maybe self-unemployed, and shortly after that, I realized I'd never again have a job in the traditional sense," he said. It was only then that he started to think of himself as an entrepreneur.

Thanks to a conservative approach to their personal finances, Hugh and Michelle had accumulated minimal debt over the years. "That was really important. It gave us a platform from which I could be entrepreneurial," said Hugh, who went on to form Harvey Operating and Production Company in the late eighties.

It was at a trap shoot in Denver in 1985 that Harvey first met the man who would become his future business partner, Bob Jornayvaz, who was also in the oil business. The friendship developed over the decade that followed, and in 1995, Jornayvaz came to Harvey for help on a horizontal drilling project near Moab, Utah.

The project soon evolved into a partnership as each realized how well he complemented the other's skills: Jornayvaz excelled in the finance side of the oil industry; Harvey was a creative and talented engineer.

Their first company, Intrepid Oil and Gas, was formed in 1996.

The partnership was a success from the start: In the first two years, they bought several wells in the West, most notably an oil well near Moab, Utah, that was so successful they nicknamed it "The Lucky Charm."

In 1997, sensing an opportunity, they took an interest in a potash mine near Moab that was closing due to declining production. Declining production could mean the mine was tapped out; it could also mean the mine just wasn't operating efficiently. Knowing the geology of the area, they sensed the latter was true, and their subsequent research confirmed it. All they had to do was figure out a more effective mining technique.



Harvey said the idea came to him out of the blue—"like two pieces of a puzzle suddenly fitting together." It involved using horizontal drilling techniques to create an intricate lattice of boreholes throughout the potash-bearing rock. Then, by percolating water through the honeycomb, they could dissolve the potash and pump it up to evaporation ponds on the surface. There was nothing new about solution mining, but horizontal drilling had never before been used for potash extraction. It was an entirely new twist. And one that turned out to be highly successful—they doubled production after purchasing the mine in 2000.

They began acquiring new potash mines, applying the same technology; simultaneously, they were exiting the oil business. In 2008, Intrepid Potash went public on the New York Stock Exchange, having grown in just eight years to become the largest potash producer in the U.S., with 750 employees and four operating mines.

"A big part of this true American success story is my partner, Robert Jornayvaz," said Harvey. "Bob is focused, bright, creative, hard working and has high ethical standards." His years of experience in finance and investment banking have proved invaluable to the partnership. "It is one thing to have a good idea," Harvey said, "but it's quite another thing to raise large amounts of capital from skeptical investors so the idea can be put into practice."

Digging Into Potash

Potash is the common name given to potassium carbonate and other salts rich in potassium. For millennia it has been used as a fertilizer; other ancient uses include the manufacture of glass, ceramics, and, beginning in 500 AD, soap. Before potash was mined, the compound was made by leaching wood ash and then evaporating the solution in large pots. The name of the white residue that remained after all the water had been boiled off was appropriately named potash.

Potash was first mined on an industrial scale in the late 19th century. Approximately 90 percent of the potash mined today is used as a fertilizer; the remaining 10 percent is used in livestock feed supplements and industrial applications. As a key fertilizer ingredient, potash increases crop yields and enhances both water retention and disease resistance in plants. Along with phosphate and nitrogen, potash is an essential ingredient of fertilizer. As ballooning world populations increase the pressure on a finite supply of arable land, an abundant and affordable supply of potash is increasingly critical to feeding the global population.

The potash mined today was primarily deposited by ancient inland seas that were cut off from the ocean and subsequently evaporated. The layers of potassium salts deposited—primarily potassium chloride or “muriate of potash”—are almost invariably mixed with sodium chloride (table salt), which is harmful to most plants and must be separated out. — *Erica Siemers*



Intrepid Potash's evaporation ponds are most colorful at the end of summer.

Alex Helmer

Clearly both men contributed to their company's growth, but in very different ways. And if one had to identify a defining act, it was teaming up in the first place; recognizing each other's talents, and by implication, their own limitations. From the start they were both confident that it would work out well, Harvey said, though he adds, “We didn't quite think that we would succeed to this level.”

For many years Harvey had contributed to the Colorado School of Mines Foundation, but taking Intrepid public made it possible to dramatically increase this support: The Hugh and Michelle Harvey Foundation was formed following the public offering in April 2008, and discussions about the gift to Mines began shortly thereafter.

Their scholars program reflects the Harveys' belief in the importance of science and engineering education. “All advances in productivity and standard of living are tied to technological advances,” said Harvey. “I couldn't ask for a better education than I got at Mines. Now I want to pay it forward.”

After carefully considering eligibility and selection guidelines, Hugh and Michelle designed the scholars program to reward merit in academic performance, outstanding character, leadership and service, with the objective of attracting top students—the best and brightest.

In certain cases students may also be selected for achieving success in the face of adversity—a quality Harvey grew up admiring in his own Italian-born mother, Gina Cantoni. She endured bombings and hunger and the death of her father during World War II, yet remained focused on completing a philosophy degree at the University of Rome. She later met and married an American serviceman, Harvey's father, and moved to the U.S., where she became a professor of English as a second language, first at Fort Lewis

College, then the University of New Mexico and later Northern Arizona University. Now 87, she was actively involved in designing the Harvey Scholars Program and is proud of the part she played in shaping the international portion of the curriculum.

Hugh and Michelle's children made the program's travel component a three-generation unanimous decision by voting with their actions. As the finishing touches were being made to the document outlining the scholars program, their son was studying engineering and learning Spanish in Santiago, Chile, while their daughter had flown to Chicago to gain special access to research materials in the Newberry Library.

The Harvey award covers full tuition and is renewable through eight semesters. It may be extended for up to two additional semesters to accommodate travel abroad, participation in the McBride Honors Program, intercollegiate athletics, a double major, the pursuit of a combined BS/MS program, or other enrichment activities.

Casting his mind back to his own days at Mines, Harvey recalls his stay on campus as both tough and fun. The toughest professors, he said, were in the Division of Engineering, and they were also his favorites. Professor Hank Babcock, he recalled, was one of the more eccentric, rousing sleeping students by throwing a piece of chalk at them with great accuracy.

And the fun part? He just laughs. He recalls with pride that he was in Mines' centennial class ('74). And he remembers with a smile the ore cart pull to the Capitol to kick off E-Days, the Coors Brewery “short tour,” and of course, that summer adventure in Europe with John Wright, a ridiculously heavy suitcase, and an intrepid spirit of adventure. [M](#)

ASCENT



Gonski Photography

By Lisa Marshall

A Bold

Young Miners take on Mount McKinley

With a frigid wind lashing at his cheeks and the slow burn of frostbite seeping into his fingertips, Thomas Wells huddled with two fellow climbers on the barren, snow-packed flanks of Alaska’s Mount McKinley, facing a decision any mountaineer hates to make.

The icy crown of North America’s tallest peak was in full view, just over a mile away and after a brutal 18-day slog, “we could taste it,” recalls Wells ’07, MS ’08. But it was after 6:30 p.m., the radio was chattering with word of an oncoming storm, and nine hours of hiking at altitude in subzero temperatures had taken its toll. Three team members, ill and weary, had already retreated.

“It was a tough moment,” Wells recalls.

It was actually one of many tough moments encountered on the 26-day, 170-mile odyssey during which six ambitious but novice mountaineers—including three Colorado School of Mines students—would test their limits and discover the right—and wrong—ways to tackle a big mountain.

“There were times that were extremely fun,” says Ryan Ford ’07, a mathematics and computer science master’s degree student who organized the trip. “But there was also a lot of misery.”





Thomas Wells



Thomas Wells



Thomas Wells

“The Great One”

Jutting 20,320 feet above Alaska’s central plain, Mt. McKinley—dubbed Denali, or “The Great One” by natives—has been the aspiration of numerous mountaineers since it was first summited in 1913. While the Himalayas dwarf it in elevation, McKinley’s high latitude makes it a uniquely challenging climb: arctic temperatures regularly dip to 40-below, and low barometric pressure leaves less oxygen in the air than at comparable altitudes farther south. Half the 1,300 climbers that attempt Denali annually turn back; 106 have died there; 39 remain on the mountain.

The majority of climbers opt for the West Buttress route, a 16-mile jaunt in which they are flown to base camp at 7,200 feet. But the Muldrow Glacier Route, a 35-mile slog through lush lowlands, past tumbling icefalls, and up the 20-mile-long glacier, was the first to be conquered, and the only way up for 37 years (until the advent of air taxis). Today, only about three teams per year attempt it.

Since age 16, when Ford first set eyes on “the Muldrow,” he knew that was how he wanted to climb the mountain. “I had never seen anything like it,” says Ford, who went to high school in Alaska.

Building a team

Six years later, Ford began gathering a team.

Thomas Wells was a studious electrical engineering student with a by-the-book mentality and a love of rock climbing. Ryan Plienness ’09 was a gregarious civil engineering student from Grand Junction, who grew up four-wheeling, camping and rafting.

The other three team members were friends of Ryan’s from Alaska.

Brandon Gonski, 22, ran a kayaking school in Wasilla. Although he had plenty of outdoor experience, very little was mountaineering. Jason Buttrick and Keeton Kroon were no strangers to mountaineering, but they had never tackled anything as serious as McKinley.

Team statistics: average age, 21.8; average big mountain experience, slim; familiarity with each other, zero.

They spent months preparing. Each saved \$2,000 for the trip, and they crafted spreadsheets outlining needs for calories, fuel and gear. However, on May 16 when they finally deposited their gear on a scale before boarding the small plane that would take them from Talkeetna to Denali National Park, they realized their first mistake: 933 pounds, an average of 153 pounds each. When the plane was unloaded and all the gear was piled up next to the isolated airstrip, the pilot laughed.

The sound of the plane’s engine fading into the distance was sobering. “We looked up and saw that we were finally on our own, in the wild, with a mountain and an adventure before us,” says Wells. “Then we looked down and saw all the weight we had to haul around for the next month. It was a feeling of excitement and dread.”

Raven robbers, crevasse falls and sheer beauty

For five days, the six hiked through marshy tundra and forded rushing rivers. They had to ferry their supplies, each day hiking to the next camp, dropping their loads, and retracing their steps to load up again.

“The first couple of days were just terrible,” recalls Plienness. “I was definitely not ready to be marching with that big-ass heavy pack.”

Then the lush lowlands gave way to glistening icefalls and the



Thomas Wells

endless expanse of packed snow that is the Muldrow glacier. May 25: “We started to get used to the sound of avalanches,” Wells recorded in his journal. May 27: “Skyscraper-sized blocks of ice towering overhead and holes big enough to swallow them underfoot.” At one point, ravens raided their cache, hauling off a day’s worth of food. Another day, Gonski slipped chest-high into a hidden crevasse, his backpack mercifully catching his fall. During the long nights cooped up in tents, strong friendships were forged and strong personalities clashed.

But arriving at Karsten’s Ridge—a snowy knife-edge with 2,000-foot drop-offs disappearing into a sea of cloud below—made every step worthwhile.

“It is to date the most beautiful thing I have ever seen,” recalls Plienness. “I’m not a serene person, but that was a moment I really didn’t have much to say.”

As they approached their icy 15,000-foot camp at Harper Glacier, they were beginning to feel the altitude; things seemed to move in slow motion. It was the highest any of them had been. Endorphins coursed. “We were within striking distance,” says Wells.

Shooting for the summit

On June 3, the team set out for 17,200 feet, aiming to once more drop off supplies, return, and move camp the next day. But brutal weather dashed their plans and they had to turn back. They crawled into their tents that night hungry, group morale low. The next day dawned fair, but the forecast from their satellite phones warned of bad weather approaching. A day behind schedule and unsure that they could establish a higher camp in a storm on an exposed ridge, the group opted for a “Hail Mary” attempt from 15,000 feet—the 5,000-foot climb in a single day was an ambitious goal, but they didn’t like the alternatives.

It was cold, but the day went well, with all six reaching the 18,200-foot Denali Pass by 4 p.m. At the very beginning of the trip, they had set the pass as an intermediate goal—they would go home proud if they made it this far. Although it was late, Alaska’s endless summer days afforded them several more hours of daylight. They were tantalizingly close to the summit. However, Ford was showing signs of serious altitude sickness; he needed to turn back.

Who would go with him? Another tough moment.

Ford, Plienness and Buttrick headed down and the others soaked in

the view—an eerily desolate spot, littered with preserved climbing gear from expeditions gone wrong. “There is nothing alive up there,” recalls Wells. “You feel very out of place and unwelcome.”

Two hours later, the trio had moved 500 vertical feet, but the weather was turning. And as Wells led the group up a 50-degree icy incline, he had an urgent call from nature. As the others huddled, Wells tried to negotiate a pit stop in minus 20-degree temperatures and 20-mile per hour winds on a slippery slope. “Things didn’t go well,” he recalls dryly. His gloves were soiled, his hands frostbitten and his confidence shaken.

Meanwhile, Gonski had taken off his gloves while trying to put on warmer pants—eight of his fingers were frostbitten.

Here marked a juncture at which many climbers arrive. It’s cold, thinking is fuzzy, and the body is weary—yet the summit beckons. It’s easy to make the wrong decision: 47 have fallen to their deaths; 19 have died of exposure; one dropped dead on the summit; 53 perished on descent.

They had been hiking 15 hours a day for more than two weeks to achieve their goal.

Now, with only 1.25 miles and 1,820 feet to go, the trio decided they had to turn back.

The road home

Back at camp, Wells was met with comic relief. Told of what happened over the radio, the team had decided Well’s messy pit stop should be their official reason for not summiting.

The next day the team descended swiftly, 9,000 feet in a single day, visions of pizza and cold beer spurring them on. Over the next three days they continued to make good time, and they were only two miles from the trailhead when tragedy almost struck. While trying to cross the swollen McKinley River, three members of the party were swept off their feet. Carried in the swift current with 100-pound packs dragging them down, they were in a very tight spot. But to everyone’s relief, they all regained their footing and clawed their way to shore.

“It was the classic case of smelling the barn too early and not taking your time,” says Plienness. “It was the scariest thing that ever happened to me.”

One year later, team members look back on the trip and its lessons fondly: pack lighter, never be hasty, keep gloves on. “I just learned so much about who I am as a person,” says Wells.

Wells is now living in Alaska after taking a job with BP. His work requires him to fly regularly from Anchorage to Prudhoe Bay on Alaska’s North Slope, and ironically, the flight path normally takes him directly over Denali. “I get to look out the window every time I go by and see how close we were, which is about a thumb’s width,” he says. And seeing this, he’s tormented by the lingering question: Could we have made it?

“It is very haunting,” he admits. [W](#)

Is it the best bet for biofuel?

Great Green

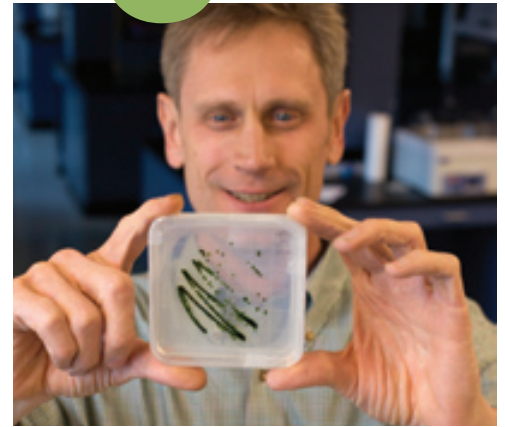
By Nick Sutcliffe
Photography by Kirsten Boyer



© Michael Hill/istockphoto

Algae can be found just about everywhere. They inhabit the oceans and almost every body of freshwater on Earth. Algae live in clouds, where they influence precipitation patterns. They play an important role in the biota of soils everywhere. Coral reefs wouldn't exist without algae. And lichens, which survive in some of the harshest environments on Earth, are part algae, part fungi. • Why they are found throughout the biosphere may be because they practically created it. Between two and three billion years ago, oxygen concentrations in the Earth's atmosphere were radically increased, paving the way for an explosion in biological diversification. This oxygenation of the atmosphere was accomplished by cyanobacteria, also called blue-green algae (though no longer classified as algae, they are close forebears). They did this by inventing photosynthesis—a biochemical innovation that gave rise to plant life. Today, we depend on algae for a large proportion of the oxygen we breathe. Most marine food chains ultimately depend on phytoplankton and other forms of algae, and terrestrial life is equally dependent in myriad ways. These humble organisms are easily overlooked, but they actually generate energy for much of life on Earth. • And if things go well, they may soon be put to work generating near-carbon-neutral energy to fuel our modern way of life. That's according to Matthew Posewitz, an assistant professor of chemistry and geochemistry at Mines, who has spent the better part of a decade studying the potential of algae for biofuels.

Greasy Algae



For example, in one year, a pond used to cultivate algae for biodiesel could produce almost fifty times more useable energy per square meter than a field of corn cultivated for ethanol, says Posewitz. It doesn't hurt that algae multiply rapidly and ponds can be harvested daily. Pipe in carbon dioxide, say from a nearby coal-fired power station, and this growth rate can be accelerated even more. Once the algae are harvested, the energy they have banked in the form of lipids can be separated, and it is a relatively simple chemical process to then convert the oil into a fuel compatible with conventional diesel engines.

Another fuel that could one day be harvested from algae is hydrogen. And this is the area that really interests Posewitz. He explains that certain kinds of algae release hydrogen gas when they are deprived of oxygen. The quest for a form of algae that could do this in the presence of oxygen, under ambient conditions and on an industrial scale has Posewitz and his colleagues raking through the muck along river banks, sifting silt from hot sulfurous ponds in Yellowstone National Park, and paddling the shallows of the Great Salt Lake.

Why such extreme environments? He's looking for the right organisms to bioengineer. "The perfect hydrogen-producing organism is unlikely to exist in nature," Posewitz explains. It's not impossible, so they keep looking, but the more likely scenario is that an organism will need to be bioengineered. For that, they need to find the most suitable species to patch together. Posewitz explains that in the Great Salt Lake, they are looking for a good host species. "If bioenergy production is ever going to be a reality," he says, "we are talking about very large-scale production, and we aren't going to

have adequate freshwater resources or arable land to devote to it. Algae in the Great Salt Lake have evolved to tolerate extremely saline water, and we have plenty of that."

On the other hand, Posewitz and his colleagues are wading through geothermal pools in Yellowstone trying to find algae with efficient hydrogen-producing metabolisms that can be transferred to the saltwater-tolerant host algae. "When we transfer traits to our organism of choice, we want to impart robust qualities that aren't going to breakdown," says Posewitz, who points out that algae adapted to high-temperature environments have much more stable enzymes and proteins.

Overall Posewitz is optimistic about the potential of biofuels: "The capacity is definitely there. It's definitely a feasible thing that we could replace substantial amounts of our fuel portfolio, potentially all of it," he says, pointing out that more than enough solar energy hits the face of the Earth in a single day to serve human energy needs for an entire year. "That's a lot of energy, but it's a big challenge to harvest ... We're going to have to occupy a pretty big space," he says.


When asked to predict when these technologies might be commercially viable, he distinguishes between the production of hydrogen and hydrocarbons. "Hydrogen is a tougher issue because the enzymes and the organisms are still geared toward CO₂ fixation. That's what evolution is about. For hydrogen, we still have to get more of a metabolic or genetic trick to make it work," says Posewitz.

He explains it in terms stopping an alga from doing what it has evolved to do—collect solar energy and store it as a hydrocarbon—and instead get the organism to capture the sun's energy and then



release it in the form of hydrogen gas at the instant before electrons are committed to reducing CO₂. He feels as though he's trying to outsmart nature—a formidable task, and he can't predict when the breakthrough will come.

He's more confident about when hydrocarbons from algae might be commercially viable. Rather than working against billions of years of evolution, Posewitz says making commercially competitive hydrocarbons from algae only requires tweaking and optimizing what they already do, and progress is fast. He says there are now hundreds of start-ups around the world trying to commercially manufacture biodiesel and other liquid hydrocarbons from algae, and he predicts that we'll see widespread industrial-scale production in about 15 years, perhaps sooner.

"We really are in an exciting time," says Posewitz. "There are lots of new techniques and tools coming out. DNA sequencing is evolving rapidly. And our ability to manipulate photosynthetic organisms is maturing." He adds, "I think the stimulus money, if it's well-spent and well-positioned, is going to lead to some pretty big advances." 

The Researcher Behind the Research

Posewitz took a circuitous path to the field of biofuels. After growing up in Montana and earning a bachelor's in chemistry from Willamette University in Oregon, he went to Dartmouth. In 1994, with PhD in hand, he came back to the West for a two-year postdoc at the University of Utah, where he applied his knowledge in transition metal biochemistry to the development of cancer therapies. Two years later he moved on to the Sloan Kettering Cancer Center in New York City while his wife attended medical school at Columbia. After Heather landed a residency in Denver, Posewitz's career shifted toward biofuels when he began working for the National Renewable Energy Laboratory in Golden. "The project was really a perfect fit for me," he says. "I had some experience in genetic engineering, the biochemistry and the transition metal part of it."

Over the course of the next few years, he and his fellow re-



searchers made some important discoveries. For one, they figured out how to transfer the hydrogen-producing abilities of algae from one organism to another—a crucial breakthrough. "So now we can move this hydrogen-producing metabolism around," says Posewitz. They also discovered mutant algae with some curious qualities. "Algae normally store their energy as starch, but we found a starchless mutant, which got us thinking, 'if they aren't going

to starch, where are all those electrons going? What kind of fuels can we maybe redirect them into?'" Research on this mutant has continued and Posewitz says he and a team of graduate students will soon begin publishing some significant new findings.

In 2004, Posewitz left NREL to join the Mines faculty as an assistant research professor of environmental science and engineering. Given that he'd already been working closely with several professors at the school, the transition was fairly seamless. "We had established very productive collaborations with several faculty and a lot of infrastructure was in place so that we could hit the ground running," Posewitz said. He was awarded a tenure-track position at the end of the 2007-08 academic year.

John Poate, Mines' vice president for research and technology transfer, was extremely pleased when Posewitz came on board. "He's one of the top researchers in the country in his field; he's really doing some amazing work."



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The Network



Peters Photography

Record Breaking Reunion

Reunion 2009 had by far the largest turnout seen in recent years, with a total of 450 attendees. Along with an exciting lineup of events, the strong showing was the result of an energetic volunteer committee that wrote letters, sent emails and organized phone trees to encourage classmates to attend.

Celebrating their 50th reunion, members of the Class of 1959 enjoyed a reception in the Ben H. Parker Student Center on Wednesday evening. This was followed the next morning by the 50th Reunion Breakfast hosted by President Bill Scoggins and his wife Karen. In an address, Scoggins honored the class' collective accomplishments, saying, "You, the Class of 1959, are an important part of Mines' legacy of excellence. As you have put your expertise to work to make the world a better place for all to live, you have demonstrated the power of a Mines education." The event also included a retrospective slideshow of images dating back to the late-fifties.

The most popular events among returning alumni included the National Earthquake Center tour, the guided Geology Trail walk, tours of campus, the Fuel Cell Center, a lively renewable energy symposium and class dinners.

New this year, the alumni association launched its first department reunion. The Petroleum Engineering Department was the first in a rotating schedule that will feature different departments each year. A total of 125 alumni registered for the focal event—a dinner held on Saturday evening. Industry veteran Harold Korell '68 delivered the keynote address, surprising everyone by announcing a \$2.5 million gift toward construction of the Petroleum Engineering Department's future home—Marquez Hall (details on p. 10).



Peters Photography



Randall Olsson Photography

50th Reunion Class

Names listed left to right: 1st Row: Jack Bowler, George Lawrence, Ron Cox, Maurice Chaffee, Wes Rehrig, Doug Ross. 2nd Row: Jim Swaisgood, Paul Shaw, Steve Bank, John Insung Myung, Sam Miller, Don Matchett, Dave Dunn, Fred Greenberg, Dan King. 3rd Row: Lowell Thomas, Bob Lame, Jim Link, William "Bill" Mills, Bill Engel, Gene Burrell, Howard Earnest, Joseph Anzman, King Robertson, Wolfgang Kyllmann, Ron Koehler. 4th Row: Steve Milne, Paul J. Ellis, Michael D. McGuire, Ronald C. Schutz, Lary G. Cahill, Walt Case, William E. Bruce, Richard Whittington, Ed Fernau, Les Bond, Darol Crays, Dick Lea, Chuck McKinnis, Ed Shackelford. 5th Row: Dick Swerdfeger, Dewitt Moss, Mike Blackwell, William Bauer, Gerald Keen, Duane Graham, Jim Payne, Gordon Steele. 6th Row: Karl Nielsen, George Krauss, Warren Hildebrandt, Bob Pearson, George Dunham, C. O. Smith, Byron G. Walker. Top left: Lifelong friends, Steven Bank '59 (left) and Paul Shaw '59.

Alumni Association Awards 2009

Each year Colorado School of Mines Alumni Association recognizes individuals who have made extraordinary contributions to the success of the school and the alumni association. We are proud to list the 2009 recipients, who received their awards at recent events. Please visit the *Mines* magazine website (<http://www.mines.edu/magazine>) to read more about each of this year's recipients.



Peters Photography

Zach Aman '09 receives his award from Joe Mahoney, CSMAA president.

Alumnus of the Future: Recognizing a student for his or her efforts to strengthen CSMAA or one who embodies the spirit of CSMAA. Recipient: **Zach Aman '09**

Young Alumnus: Acknowledging outstanding accomplishments by recent graduates. Recipient: **Randall Phelps '96**

Outstanding Alumnus: Recognizing members of the Colorado School of Mines Alumni Association for meritorious service to the organization. Recipient: **Artemas "Judge" Holmes '60.**

Melville F. Coolbaugh Memorial Award: In recognition of outstanding contributions to the reputation and competitive profile of Colorado School of Mines. Recipient: **Jerome Gamba '58**

Alumni Teaching Award: This award recognizes superior teaching at the undergraduate level over a period of several years and provides encouragement and incentive for teaching achievement. Recipients: **James McNeil**, professor of physics; and **Ravel Ammerman '81, PhD '08**, senior lecturer – engineering.

Coolbaugh Senior Awards: By rewarding academic success with need-based financial support for rising seniors, the Coolbaugh Senior Awards reinforce academic excellence. Recipients: 1st place: **Peter Trask**; 2nd place tie: **Andrea Casias** and **Richard Vidal**

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Fast Forward

Class Notes
 Weddings
 Alumni Profiles
 Births
 Passings

Editor's Note: Class Notes is one of the most read and appreciated sections of *Mines* magazine. Most of the listings you read here are generated when alumni inform the alumni association of job changes. To enliven this stream of information, the magazine is seeking "class correspondents" to actively collect and forward class notes or invite classmates to go to www.minesonline.net to submit personal updates. If you have your ear to the ground and might be interested in serving as a class correspondent, please let us know by emailing magazine@mines.edu.

1950

Tyler Brinker is enjoying retirement with family and grandkids! He lives in Huntington Beach, CA.

Charles E. Melbye is working with Trevali Resources and Cardero Iron Ore Corp. He lives in Eden Prairie, MN.

1952

H. Don Adams is owner of Don Adams & Associates in Golden, CO.

1957

Arthur R. "Ron" Briggs '57 and Theodora J. "Teddie" Richards were married December 19, 2008 in Centennial, CO (see photo in Weddings). After a short honeymoon in Estes Park, the bride returned to her duties at Cherry Creek School District and the groom returned to his petroleum consulting practice. In late March 2009, the couple went on a honeymoon cruise to the eastern Caribbean. The couple now resides in Englewood. Both Teddie, age 62, and Ron, age 75, agree, "We are not planning to have any more children for a few years."

Charles "Scottie" Bruce is a president of Comicen.

John I. Coats is a senior project manager for Pacific Western Technologies, Ltd. in Wheat Ridge, CO.

1959

George N. Brown, Jr. has taken over as chairman of Craven County Board of Commissioners in North Carolina.

Robert R. Dorfler is a vice president and general manager with Langeloth Metallurgical Company in Langeloth, PA.

Ronald C. Schutz is the owner of The Craftsman, an ornamental woodwork and molding shop in Colorado Springs, CO.

Richard T. Whittington is president of Lock Technology Inc. in Beltsville, MD.

1960

Jack C. Haptonstall of Golden, CO, is a contractor with Pincok, Allen and Holt, Inc. in Lakewood.

R. Glenn Vawter is president of ATP Services LLC in Glenwood Springs, CO.

1961

Alan E. McGlauchlin is the vicar of Holy Trinity Episcopal Church in Eastland, TX.

Joseph R. Wright, Jr. is chief executive officer and vice chairman of the board of Scientific Games Corporation in New York, NY.

1962

Hubert S. Chin is director of engineering with Blastec Company Ltd.

1963

Earl F. Jaynes retired from Forest Oil Corporation in 2008. He lives in Conifer, CO.

1964

Frank J. Buturla, Jr. is senior construction manager for Golder Associates in Denver, CO.

Anthony W. Worcester is a consultant with Doe Run Peru in Saint Louis, MO.

1965

Lawrence G. Eagan is an operations manager with EnviroFocus Technologies in Tampa, FL.

Robert M. Woodbury is the owner of Ace Hardware in Commerce City, CO.

1966

David E. Monarchi is a chief scientist with Syntrix Executive Solutions in Boulder, CO.

Weddings



Dustin Rice '02 and Cayley Pendergrass were married September 2, 2007, at the Kalamazoo Nature Center in Kalamazoo, MI. Mines graduates Merle Van Houten '01, Matthew Spink '02 and Aaron Thompson '03 attended. The Rices have since relocated to San Diego, CA.



Arthur R. "Ron" Briggs '57 and Theodora J. "Teddie" Richards were married December 19, 2008 in Centennial, CO. The couple now resides in Englewood. (For more details, see 1957 class notes.)



Zane Ross '06 and Danielle Cook were married on May 31, 2008, at the University of Denver. Nineteen Mines alumni attended. Zane and Danielle honeymooned in Mexico. (For more details, go to minesonline.net—class notes.)



Chad Reeves '07 and **Charity Braz '08** were married on January 10, 2009, at the United Methodist Church in Golden, CO. Seven Mines were in attendance. (For more details, go to minesonline.net—class notes.)



Ronald '98 and **Heather Keller** were married on December 12, 2008. The celebration took place at The Club at Cordillera in Edwards, CO. They currently reside in Highlands Ranch, CO.



Charli J. Strebig '02, MS '04 and **Brandon J. Baker '03** were married on July 5, 2008, at Sunlight Mountain Resort in Glenwood Springs, CO. Justin Gale '02, MS '03 was a groomsman and Christian Veillette '01 was in attendance.



John '95 and **Kelley Starritt** were married at the Brown Palace in Denver, CO, on August 1, 2008. Twenty-six Mines alumni were in attendance. (For more details, go to minesonline.net—class notes.)

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

1967

Stephen P. Collings is a president with Cameco Resources in Lakewood, CO.

Robert W. Scheck is a chief engineer with Alpine Engineering, Inc. in Golden, CO.

1968

William A. Abbott is a senior petroleum engineer with Norwest Corporation in Golden, CO.

Robert M. Burnham is working with Wood Mackenzie in Arvada, CO, as a senior analyst – Americas Coal Research.

Harold M. Korell recently retired from his position as chief executive officer and chairman of the board for Southwestern Energy Company

in Houston, TX. He remains on the company's board of directors as executive chairman (more on p.10).

John E. Olson II is an officer with Alaska Law Enforcement Information Sharing System in Anchorage, AK.

John R. Wise is a project manager with Solomon Associates, Inc. in Dallas, TX.



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1969

William K. Crowder is county manager for Jackson County, CO. He lives in Walden, CO.

Stephen S. Hart is retired and lives in Lakewood, CO.

Robert C. Hess is principal of Prudential Real Estate Investors in Parsippany, NJ.

James A. Krebs, Jr. is director of Seminole Energy Services in Denver, CO.

Christopher K. Loomis is an asset care planner with Miller Coors Brewing Company in Golden, CO.

John T. McDonough, Jr. is a consultant with Barrick Gold Corporation in Salt Lake City, UT.

Gregory D. Stark of Denton, TX, has founded Greg Stark Consultancy.

John D. Wright is chief engineer for Wright Consulting Company in Golden, CO.

1970

Richard E. Ellwanger is employed by Sigma Technologies International, Inc. in Tucson, AZ.

Richard J. Kehmeier of Conifer, CO, is a senior geologist with Vector Engineering.

Jack A. Krug, previously a partner with Norwest Questa Engineering Corp, is now an owner of Whidbey Wine. He lives in Langley, WA.

Gary R. Steele of Centennial, CO, is a vice president of corporate marketing of Energy Fuels.

1971

Rodney J. Eichler is co-chief operating officer and president – international for Apache Corporation. He lives in Centennial, CO.

Robert D. May, Jr. is a senior geologist for AMEC Earth & Environmental in Bluefield, WV.

Robert F. Reiner is a vice president of operations with Double Eagle Petroleum Co. in Casper, WY.

Daniel R. Walton is a head of global coal sales with Wood Mackenzie in Annapolis, MD.

1972

Michael G. Long is a petroleum consultant in Las Vegas, NV.

Karen L. Tonso is an associate professor – foundations of education at Wayne State University in Detroit, MI. She was recently awarded the Betty Vetter Award for Research by Women in Engineering Program Advocates Network. (More on minesonline.net)

1973

Raul E. Alvarado has retired from Accenture and lives in Los Angeles, CA.

Gene M. Gehauf is a process engineer with Mustang Engineering and Constructors in Houston, TX.

Jefferson D. McKenzie is a Utah acting branch chief of solid minerals with the Bureau of Land Management in Salt Lake City, UT. He lives in West Valley, UT.

1974

John L. Bedwell is a co-owner of ML2 Resources, LLC in Norman, OK.

Michael A. Benza is general manager of aggregates operations for Eastern Concrete and Materials in Hamburg, NJ.

William E. Brooks is a senior metallurgical specialist with Worley Parsons in Corpus Christi, TX.

Dave O. Cox is vice president of engineering for Rampart Energy in Denver, CO. He lives in Golden.

Leonila R. Hanley is an environmental engineer with US Public Health Service in Denver, CO.

Thomas R. Kelly is COO of Inca Pacific Resources.

C. Brock O'Kelley of Las Vegas, NV, is an assistant general manager with Molycorp Minerals, LLC in Mountain Pass, CA.

1975

Richard E. Ackermann is a mining consultant with Continental Placer, Inc. in Wheaton, IL. He lives in Oswego, IL.

Michael D. Cola retired from the Colorado Division of Water Resources, Dam Safety Branch, on May 1, 2007.

Profile

Having “a Blast” Mining for Minerals



Bryan Lees '85 makes his living from mining. But he's not hauling hundreds of tons of dirt out of a mountain; instead, he's carefully chipping away at the walls of old mine shafts searching for gems and minerals.

The owner of a world-renowned mineral specimen and gemstone mining company, Lees has collected rocks since he was a kid (“pebbles in neighbors’ driveways,” he laughs). But it wasn't until he got to Mines, that he realized it could be a vocation, not just a hobby.

“In school, I met a guy in the field who was collecting and selling minerals,” Lees says. “I had been to mineral shows, but I had no concept of selling these things... It was like a little light bulb went off.”

He met his wife, Kathryn (Lenstrom) Lees '87, at Mines. And in 1985, before either one had graduated, and while Bryan was contending with the added load of the McBride Honors program, the young couple started Collector's Edge Minerals. “We didn't have much money for equipment,” he says. “Big mining projects were sort of a fantasy.” They started out buying and selling minerals for collections around the world and after a few years invested in a barite mining project in northeastern Colorado.

“We got extremely lucky,” Lees says, finding big pockets of barite crystals in 1989. The find enabled them to begin developing Collector's Edge into one of the first companies dedicated solely to the mining of mineral specimens.

In 1991, they leased an old silver mine in Alma, CO, and solicited investors to underwrite the mining of rhodochrosite, a blood-red mineral that had been found—and largely discarded—during the mine's silver heyday. Rhodochrosite proved to be the Lees' jackpot.

A film crew from the Denver Museum of Nature and Science, at the mine for some routine footage, captured Lees reaching into a hole and pulling out the largest rhodochrosite specimen ever found: the “Alma King.” It

can now be seen at the Coors Mineral Hall exhibit in the museum, as can an entire six-foot pocket from the mine, painstakingly reconstructed by Lees and his staff.

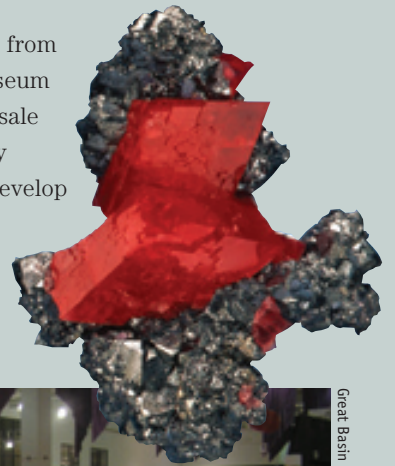
By 1999, the Lees had seven concurrent projects worldwide, from Brazil to Namibia. Along the way, Lees developed innovative mineral extraction and preservation techniques, for which he received the prestigious Carnegie Mineralogical Award in 1998 and the Mines Medal in 2003.

Today, the Collector's Edge showroom and warehouse in Golden contain the world's most advanced specimen preparation laboratory, in addition to thousands of mineral specimens for sale, from museum-quality collector's items to wholesale bargains.

“None of this would exist if I hadn't gone to Mines,” says Lees, who founded the advisory board for the school's Geology Museum.

“Bryan brings a valuable perspective from the mineral collecting world,” says Museum Director Bruce Geller, adding that the sale of rhodochrosite specimens donated by Lees has helped the museum further develop its world-class exhibits.

“It's been amazing,” Lees concludes, “to turn a childhood interest into a business that actually works.”



Lees at the 2008 Tuscon Gem and Mineral Show. The rhodochrosite above, named “Wings,” was discovered in the Sweet Home Mine in 1998. It measures 7 x 5 inches.

Alumni

Fast Forward

Daniel W. Elliott is president and owner of BenTyler Enterprises, Inc. in Sunnyvale, CA.

John D. Fix is a cost consultant with R. W. Beck and Associates in Denver, CO.

Gregg J. Hodges is a general manager – Canada with PSI Engineering.

Frank W. Jarrett is an instructor and senior process engineer with John M. Campbell and Co. in Centennial, CO.

James E. McGuigan is president of Hy-Tran, Inc. in Golden, CO.

James A. Nunn is an engineer and supervisor with Precision Mine Repair, Inc.

Robert F. Unger is a president and COO with Helix Petroleum LLC in Dallas, TX.

1976

Michael Carney is a production consultant with Schlumberger, Ltd. in Houston, TX.

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Arthur L. Carpenter is a consultant and statistician for California Occidental Consultants (CALOXY) in Anchorage, AK.



Scott Crabtree is senior tax manager for Ramirez International, a full-service CPA and consulting firm in Irvine, CA. He resides in San Clemente.

M. Stephen Enders of Castle Rock, CO, is a director with Renaissance Resource Partners.

John E. Vorwerk is a senior reservoir engineer for Forest Oil Corporation in Denver, CO.

1977

Robert D. Deister II is a certified financial planner with National Planning Corporation in Leadville, CO.

William R. Olson of Carmel by the Sea, CA, is a president with Drco.

1978

James C. Atkinson is an engineering manager with Chugach World Services Inc. in Tamuning, Guam, where he lives.

Timothy L. Stouffer is engineering career development manager for Marathon Oil Corporation in Houston, TX.

James K. Swain is a business planning and commercial manager with Chevron in San Ramon, CA.

Janice D. Williams is a senior director of soil and groundwater remediation with CH2M Hill, Inc. in Richland, WA.

Timothy A. Young is an executive vice president with Frontier Energy, Inc. in Tulsa, OK.

1979

David A. Bird of Englewood, CO, works for Geomage as executive vice president for North America.

George R. Jackson is manager of production for the Devon Energy Corporation in Cresson, TX.

Steven A. Jensen is a senior geophysicist at Excel Geophysical Services Inc. in Greenwood Village, CO.

Ruth M. Lang is manager of water waste for DCP Midstream in Denver, CO.

Daniel R. Lockwood is vice president of New Tech Engineering in Fort Worth, TX.

Peter B. Papazian is an electrical engineer for the Institute for Telecommunication Sciences in Boulder, CO.

Mark L. Pease of Spring, TX, is a CEO of BreitBurn Energy Partners LP in Houston, TX.

Dennis A. Pieters is director of reservoir engineering for Huber Energy in Houston, TX.

Laura G. Reeve is a science teacher at The Girls' Middle School in Mountain View, CA. She lives in Santa Clara, CA.

Susan Howarth Rhodes is a manager of contraband detection technologies with Sandia National Laboratories in Albuquerque, NM.

Rodney D. Rosenkranz is a manager of driver programs at the Oregon Department of Transportation.

Shelby S. Switzer III is operations and engineering manager for Pitkin Petroleum in Makati City, Philippines.

Russell W. Truby is a drilling superintendent for Marathon Oil Corporation in Houston, TX.

William M. Zisch is vice president of operations with Royal Gold, Inc. in Denver, CO.

1980

Mark C. Debiase is a CEO of PhilanthroCorp, Inc. in Colorado Springs, CO.

Deborah S. Goodman is an independent wildlife and animal artist in Lantzville, British Columbia, Canada.

Jeffrey B. Jennings is a Williston Basin geologist with G3 Operating, LLC in Williston, ND.

Loren R. Lasky of Titusville, NJ, is a geologist at New Jersey Department of Environmental Protection.

Jacqueline R. McCorkindale of Kary, TX, is a lead teacher at Kingsland Baptist Church in Katy, TX.

Ronald M. Pratt is a mathematics professor for Fresno Pacific University in Fresno, CA.

Wilfred R. Roux is a senior vice president of geophysics with Bill Barrett Corporation in Denver, CO.

C. Linda Slater is a mineral resource specialist for the Ohio Department of Natural Resources in Cambridge, OH.

Bret M. Willuhn is a design build manager with Granite Construction Inc. in Watsonville, CA.



Class of 2029



Stephanie and Dustin Bennetts '03 are proud to announce the birth of their son, Beau Daniel, born November 30, 2008.



Rich '95 and Pam McNamara welcomed the arrival of their son, Christopher Richard, on April 9, 2009. Christopher was born in Denver, weighing 8lbs 1oz, and measuring 19 inches long.



Brian '97 and Emily Kirby joyfully announce the birth of their baby girl, Elizabeth Sue, on March 9, 2009, weighing 6lbs 14oz and measuring 20 inches long.



James '08 and Cynthia Venendaal are proud to announce the birth of their son, Tanner Wesley. He was born in Boulder, CO, on December 4, 2008, weighing 8lbs and measuring 19¾ inches.



Mike '03 and Erin Mitchell welcomed Delanie May to their family on May 30, 2008.

Agata '04, MS '06 and Jered '04 Dean announce the arrival of their second child, Isaac Anthony, born March 8, 2009, weighing 8lbs 4oz. His older brother, Matthew Ray, was born March 6, 2007.



Ted '94 and Melissa Wurfel announce the birth of Sam Thomas on October 23, 2008. Sam joins his older brother Jack, born June 17, 1999.

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Contact Linda Landrum (303.273.3142) or David Mays (303.273.3140)



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Editor's Note: Due to a procedural change, *Mines* magazine has been able to generate a much larger number of class notes for this issue. We have printed these through the Class of 1980; alumni with updates in later classes are listed below and their information can be accessed on minesonline.net.* In fact, all class notes published in *Mines* for the last two years can be found on the site. When you visit, take a few moments to enter your latest information, and perhaps upload a picture. If you do, we'll list you here in the next issue.

*** Instructions for viewing class notes online:**

If you have never logged into minesonline.net:

1. Go to <http://minesonline.net>
2. Click the red "First Time Login" link top right
3. Enter name and select your record (hint: if your name appears twice, select the record that lists your degree)
5. Enter your authenticator ID. (Printed above your name on back cover, or find it in a recent e-newsletter from CSMAA. Can't find it? Email CSMAA@mines.edu and we'll send it.)
6. Create username and password, then confirm/correct contact information.
7. Click "My Stuff" tab and select "Class Notes"

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3. Update information if necessary
4. Click on "My Stuff" tab on left
5. Click on Class Notes

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William E. Cobb
Gary J. Coubrough
Bryan J. Evans
Melanie D. Gipe
Jere B. Harper
Phillip L. Hedges
Frederick C. Heneman
Victor A. Kelson
Michael G. Malsam
Gary McFaddin
Thomas E. Milner
Colin C. Nisbeth
Richard B. Shaw
Thomas J. Vander Ark

1982

Brian A. Eberhard
Lynn Boone Henry
Thomas J. Knight
Beverly A. Marshall
John C. Poulos
Stephen E. Randolph
C. Michael Schweser
Michael L. Troyer
Keith G. Zmerzlikar

1983

Bradley J. Bacon
Paul W. Boucher
Carey L. Brady

Charles S. Brooks
Reg K. Browne
Sandra L. Docherty
Joel A. Eacker
Lisa M. Edington
Leonard A. Eros
Eric L. Geist
Todd R. Habliston
Stephen T. Harpham
Julie A. Kinder
Nicholas J. Lundy
Walter A. Moore
William T. Westfall
Thomas P. Young

1984

Scott E. Affelt
Kevin N. Brown
Daniel R. Dexter
William E. Dunning
James E. Frey
Steven C. Gallington
Karen Krug
Jeffrey P. Lee
Alan Lindsey
Robert A. Lisman
David F. List
Ashby H. McMullan
Joseph A. Medeski
Steven L. Meyer
Thomas K. Moffitt

Profile

Industry Veteran Puts Recent Grad Through "Boot Camp"

Stewart Chuber '52 worked in the oil and gas field for 10 years before he found a mentor. When he did, he benefitted immensely, and went on to flourish: With a Ph.D. from Stanford University, Chuber has held senior positions in a number of oil and gas companies, lectured around the country, and since 1978, owned and operated Texas-based Fayette Exploration Company.

Chuber believes mentorship is "the most important thing a young guy new to the business needs." So, when he learned about the creation of a Geoscience Boot Camp in which freshly minted geologists and geophysicists would spend 12 weeks honing their field skills under the tutelage of seasoned instructors and mentors, Chuber was intrigued.



John F. Mueller, Jr.
Karen G. Ostrander-Krug
Bruce D. Peterman
Derrick M. Sandberg
Craig A. Seal
Cleave A. Simpson, Jr.
Michael L. Stewart
Gregg A. Tripp
Christopher J. Weege

1985

Paul M. Anderson
Larry E. Arnold
Haakon J. Bjorlum
Glenn E. Emery
Gonzalo Garcia-Huidobro
Gregory D. Gordon
Kleber J. Hadsell
Michael G. Hill
James T. Hruby
Thomas M. Maul
Erica L. Mitchell
Paul J. Pennington
Peter J. Storch
Stephen M. Struna
Stephen D. Whitham

1986

William R. Bloom
Lynn C. Cain
Frank G. Feero, Jr.

Thomas Goebel
Michael J. Hager
Curtis J. Kruse
Sue McFaddin
Mark L. Peak
Polly Robson
David S. Rosener
Dean Q. Volk
Robert M. Zimmerman

1987

Olga L. Ekberg
Matthew J. Horton
Gilberto Marcha, Jr.
Richard J. Reuter
Timothy M. Thomas
Karri E. Unruh
Steven C. Wood

1988

James A. Hull
Jeffrey D. Jarriel
Nicolas Lacouture
Raulie M. Pederson
Joel D. Schneyer
Brian P. Shea
David W. Sobernheim
John C. Stites
James F. Uhlinger
Todd M. Versaw
Jamal S. Yanaki

1989

Andrew L. Baker
Christopher R. Brown
Robert L. Elliott
Colin M. Engle
Stephanie J. Sangaline
Geoffrey N. Smith
Joseph E. Staton
Eric J. White

1990

William J. Armstrong
Wynn Eakins
Richard E. Evans
Robert J. Frank III
Julia Hoagland
Bernhard C. Koch
Darren D. Larson
Mark K. Reeves

1991

Brian W. Ackman
Derende M. Coover
Adel Elsharkawy
John G. Green, Jr.
Joseph H. Katz
James S. Klima
Mark F. Lindsey
Katie Joe McDonough
David G. Ray
David S. Roby

Jeffrey B. Searls
Wade A. Tate
Ahmad Zainudin Nordin

1992

Philip J. Allen
Lewis S. Blumstein
Brett K. Brunk
Gokhan Erdem
Francesca Fazzari
David Fazzino
Benjamin L. Godwin
Todd M. Harwood
Geoffrey A. Houlton
Christopher M. Martinez
Robert E. Poirrier, Jr.
Elviera T. Putri
Randall P. Sulte
Steven J. Tua

1993

Peter K. Blomquist
Ronald P. Burt
Siddhartha Gaur
Bradley J. Horn
Michael D. Martino
Danielle L. Reader
Catherine J. Rein
Michael D. Robb

1994

Hisham A. Al-Siyabi
Walter K. Conrad, Jr.
Jason A. Maas
Andrew J. Marner
John M. Swille
Edward W. Weidert
Todd L. Williams

1995

John P.J. Gorman
Anna C. Hanley
Richard D. Henderson
Paul M. McPheeters
Russell D. Sammons
Paul M. Santi
Bradford J. Sinex III
John Starritt

1996

Leslie J. Armentrout
Kegan J. Baird
Anthony C. Blakely
Christopher W. Clark
Tonya J. Hart
Christopher G. Locallo
Karen R. Phelps
Robert A. Pimentel
Mary C. Portillo
Kindra M. Snow-
McGregor

“I knew this would shorten the time it took for a new geologist to go from a beginner to a producer of prospects,” he said. “And I figured anyone graduating from Mines or Stanford would appreciate this type of mentoring.”

So last year, Chuber set up a scholarship for the program through the American Association of Petroleum Geologists, specifically for a graduate of either of his alma maters.

Five thousand miles away, Joe Dumesnil MS '07 was just finishing up his second master's degree at the Institut Francais du Petrole in Paris, France. He was enrolled in a joint Mines-IFP degree program in mineral economics and international petroleum business management.

It was the alumni association that put the two in contact with one another. “I didn't know Joe, but I read his resume. He seemed like a real self-starter,” Chuber says. Dumesnil eagerly accepted the scholarship, arriving in Houston in August 2008 to begin what is formally called the Geoscience Subsurface Interpretation and Mapping Certification Program.

Put together by a company based in Houston called Subsurface Consultants and Associates, the three-month course acquaints new professionals with basic geological and geophysical interpretation skills—something managers

in the industry (ironically) find lacking among today's computer-savvy recruits. Dumesnil was one of seven participants in the program. Following six weeks of technical coursework, boot camp participants spent another six weeks applying their newly honed skills to real-life oil and gas projects.

“We were given a bunch of data to sort through to generate a prospect, develop a plan and determine where to go next,” says Dumesnil. In retrospect, he said the program “was the catalyst for jump-starting the next phase of my career.” When asked how frequently he uses what he learned in the program now that he's a log analyst/ petrophysicist for Halliburton, he says, “Daily! Hourly! Minute-ly!”

Benefactor and recipient hit it off when Chuber visited boot camp, and the two have remained in touch since the program ended in November. “I told Dr. Chuber I can't thank him enough,” said Dumesnil. “I hope I'm given the opportunity to pay it forward someday.”

He may well have that opportunity: “Joe's a guy who's probably going far in the oil business,” says Chuber. Thanks to some networking and a generous alumnus, he might get there a little faster.

1997

Tricia M. Baird
 Scott S. Birkmire
 David D. Crichton IV
 Ryan M. Giese
 Seth S. Gleiman
 Christoph M. Goss
 Brian D. Hoeschen
 Kristopher G. Johnson
 Tina Maglio Johnson
 Brian C. Kirby
 Steven H. Meiggs
 Fernando A. Menendez
 William P. Mulligan
 Steven F. Quigley
 Brooke Rosener
 Martin H. Sabo
 Matthew T. Sarles
 Jared M. Spritzer
 Flavio Vasconcelos
 Tonya L. Wyatt

1998

Matthew T. Anderson
 Fernando H. Aurora
 Vincent S. Carabelos
 Travis C. Cooper
 Meredyth M.S. Crichton
 Jerome R. Edwards
 Evan-Pierre B. Genaud
 Edwin R. Gordon
 Shawn D. Green
 Tina K. Paul Joseph
 Wesley J. Kaisershot
 James E. Kassian
 Ronald Keller
 John S. Law
 Andrew D. McAuley
 Chad T. McMullen
 Russell K. Taga
 Weiping Wang

1999

Ryan T. Bennett
 Bastiaan E. Cornelissen
 Graig A. Crawford

Vanessa A. Davies-Pappas
 Karen L. Dennis
 Katie A. Devlin
 Luke E. Erikson
 Jeffrey R. Forster
 Ruth M. Harper
 Michael R. Jones
 Steven T. Kendrick
 Jennifer L. Littleton
 Dominic M. Magaisa
 Daniel D. Matlock
 Tathagata Trent Mukherjee
 James A. Plutt
 Donald S. Reimer
 William J. Tarantino
 Jackson A. Unrau
 Nathan A. Wanstrath

2000

Carole R. Edwards
 Vanessa L. Henderson
 R. Kris Jensen

Natalie E. Altberg Lousberg
 Matthew S. MacRostie
 Jennifer Wahl Martino
 Adam M. Michener
 Diane L. Oshlo
 Jared M. Purdy
 Lance G. Randolph
 Devin Lee Dodge Schroeder
 Mollie K. Shatek
 James M. Ticconi
 Chontel Trujillo
 Edwin W. Walton
 Lan Wang

2001

Karen L. Brungard
 Robert S. Capps
 Zorigtkhuu Davaanyam
 Biljana Djoric
 Azy Dony
 Mark W. Elliott
 Rebecca A. Furtado
 Brian K. Hayden
 Russel P. Lannin
 Jeremiah P. MacSleyne
 Matthew B. McCormick
 Jason A. Medina
 Christopher T. Mills
 Bryant Mook
 Juan Pablo Moriamez Moreno
 Joshua D. Nielsen
 Laura C. Rojas
 Megan Holman Stiefvater

2002

Arief J. Andriyanto
 Anne M. Barnhart
 Mark A. Bedford
 Justin H. Chandler
 Ryan J. Countryman
 Eric R. Drennan
 Eva Maria Gomez
 Brian T. Harrington
 Niles R. Heier
 Jacob B. Kapp
 Kristen A. Lewis
 Eric J. Marshall
 Eduardo J. Morillo
 M. Curtis Perry
 Michelle A. Puca
 Dustin Rice
 Michelle L. Rodriguez
 Ian C. Schick
 Charli J. Strebiger

2003

Andy Aakhus-Witt
 Ryota Abe
 Edward J. Alcock
 Brandon J. Baker

Ahmed Khaleefa Al-Neaimi
 Robert W. Applegate, Jr.
 Matthew J. Berg
 Justin B. Buckmaster
 Andrea M. Giersdorf
 Angela S. Hager
 Andrew L. Headley
 John M. Kelly
 William E. Martinez
 Ismael Mendoza
 Patricia O'Day-Greenfield
 James Robert Oltmans
 Atul Narsinh Rathod
 Adam D. Sallee
 Lynna J. Scranton
 Eric A. Tanner
 Andrew S. Tripp

2004

Steven R. Adams
 Richard J. Arvizo
 Heidi Bauer
 Adriana P. Blesa
 Thomas L. Bonnie
 Craig A. Cavanaugh
 Aspen L. Coombs
 Shane R. Copey
 Juergen Dreier
 Gil Garcia
 Paul E. Hopkins
 Jonathan P. Jeppson
 Johnny Lee
 Cristian H. Malaver
 Tshikut Binen Mbangou
 Megan Meier
 Jason S. Petermen
 William K. Seifert
 Neil A. Shea
 David A. Sievers
 H. Shawn Smith
 Troy R. Svigel
 Ellen T. Swanson
 Vasili G. Tasoulis
 Brandon D. Tinianov
 Colleen K. Tolle
 Alisha R. Tremaine
 Cathleen A. Valencia
 Stephanie A. Wyandt Williams

2005

David A. Barth
 Adrienne L. Bash
 Earl D. Benson
 Lars-Erik Boehnke
 Vanessa E. Bull
 Ryan P. Cadenhead
 Conor L. Carroll
 Timothy W. Casias
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 Niccole C. Culligan
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2006

John M. Agee
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2007

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Tera L. Scott
Adam F. Seibel
Donovan D. Smith
Travis K. Test
Kevan Thurman
Andrew R. Trainer
Sarah Vander Meulen
Jeremy R. Wells
Victor N. Xuan
John M. Yarbrough
Shan Zi

2008

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Marshall W. Banks
Christopher F. Barnes
Allen L. Baybayan
Geoffrey T. Bee
Charity Braz
Matthew C. Benigni
Brian R. Berwick
Bradley C. Bettag
Spencer M. Biddle
Aubay A. Bingham
Michael E.E. Breece
Travis J. Broersma
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Sarah L. Ladouceur
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Daniel A. Lockley
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Timothy J. Loughheed Jr.
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Jonathan McCaffery
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Ivayla M. Tomova
Daniel Travis
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2009

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Justin J. Beougher
Matthew J. Curtice
Brent E. Driller
Andrew J. Ferguson
Emily A. Freeman
Mark Gelhaus
Alexsander Lopez
Jason N. Mayyak
Lucas A. Munsteter
David B. Wages
Muhammad J. Zulhaimi

Passings

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

—Thomas Campbell 1777-1844



MILLARD "BENS" E. BENSON '52 of Windsor, CO, passed away on January 8, 2009. Born in Batavia, IL, in 1926, he and his family moved to Burlingame, CA in the late thirties. There he attended high school, started college and met the love of his life, G. Aldeen Erickson. On August 28, 1948, the two were married. They moved to Golden so Bens could attend Mines,

where he joined the Kappa Sigma Fraternity. In 1952, he graduated with a degree in petroleum engineering and launched a 30-year career with Texaco, starting in Paso Robles and the San Ardo fields around Sacramento, CA. Bens and Aldeen moved up and down the coast of California while raising their two children. After they graduated high school, he and his wife lived in Iran, England and Portugal; he also lived for a short time in Angola. Bens retired from Texaco in 1982, and then he and Aldeen moved to Oklahoma City, OK, to work for Kerr McGee. Beyond his work, Bens spent time volunteering as a teacher for youth and church groups. He was always athletic: football in high school, track and field in college. He also enjoyed golf, tennis and skiing. He and Aldeen enjoyed playing cribbage, and were known around many bridge tables. The couple celebrated their 60th wedding anniversary in August 2008. He is survived by his wife; son, Ray; daughter, Sharon; three grandchildren; and brother, Phil.



FLOYD D. BURNSIDE '50 of Highlands Ranch, CO, died on May 1, 2009. Born in Westfield, PA, in 1922, Floyd met his wife Charlotte while attending Painted Post High School in New York. After graduating, they attended separate colleges: Floyd to Mines and Charlotte to Syracuse and Ithaca College for music. At Mines, Floyd was a member of the Sigma Phi Epsilon

fraternity and graduated with a professional degree in petroleum engineering. In 1941, he enlisted with the Navy Air Corps and was an ensign with Navy Squadrons 18 and 20 from 1941 to 1946. On July 3, 1948, Floyd and Charlotte were married in Bath, NY. Together they traveled the world, climbing the pyramids in Egypt and kissing the Blarney Stone in Ireland. They raised their family in Colorado, Wyoming and Montana. Floyd spent 28 years with Shell Oil and also enjoyed several years as a petroleum instructor with his friend, Jerry Bond. He was predeceased by Charlotte in 2003. He is survived by his son, Kim; daughters, Linda and Diane; and five grandchildren.



MICHAEL "MYKE" W. CARVER '73 of Springbrook, WI, passed away on May 12, 2007. Born in Denver in 1946, Myke graduated from Ranum High School in 1964 and immediately joined the U.S. Navy. He served on the USS *Hornet* for two deployments during the Vietnam War. After his honorable discharge, he continued his education

at the University of Colorado, studying aerospace engineering. He then came to Mines to study geophysical engineering, graduating with a bachelor's degree in 1973. After moving to Irving, TX, and later Salt Lake City, UT, for work, Michael settled in Springbrook in 1986 to help run a bed and breakfast with his future wife, Kathy Fredricks. He enjoyed expressing himself through his writing and through his sense of humor. He is survived by his wife, Kathy; his mother, Esther Moakley; his brothers, Bill Carver and Joe Moakley; and sisters, Kathy Moakley and Judy Devine.



ALBERT F. CZARNOWSKY '48 of Fort Collins, CO, passed away on April 30, 2009. Born in 1919, Albert grew up in Denver and graduated from North High School before attending Mines. After his sophomore year, during the summer of 1941, he enlisted in the Army Air Corps and served as a bombardier on a B-17, flying missions over France and Germany in 1943. He returned to

Mines after the war and graduated with a professional degree in mining engineering in 1948, the same year he married Helen Lesage, the sister of Robert Lesage '48. He began his career as the resident mine engineer for the Union Pacific Railroad at their underground coal mines near Rock Springs, WY. In 1951, he joined the Mining Conservation Branch of the U.S. Geological Survey as a mining engineer. In 1959, he moved to Montana with the USGS as the area mining supervisor and presided over the coal leasing activity that occurred in the sixties and seventies in the famed Powder River Basin of Wyoming. In 1975, he was transferred to New Mexico to oversee uranium activity. He retired in 1981. He and Helen returned to Colorado in 1985, taking up residence in Fort Collins. He served as a director of ACZ Inc., a mining and environmental testing laboratory owned by his son, Alan Czarnowsky '75. In addition to serving as a director, Albert assisted as a project adviser on many of the company's coal projects throughout the western U.S. His beloved Helen passed away in 1991. He is survived by his daughter, Christyne; sons, Alan and Michael; four granddaughters; and one great-grandson.



FREDERICK L. DOTY '43 of Statesville, NC, died on June 9, 2008. Born in Wheat Ridge, CO, Frederick attended Mines after winning a competitive statewide scholarship. He graduated with a professional degree in metallurgical engineering. During his senior year at Mines, he joined the U.S. Navy and was later sent to Midshipman School at Notre Dame. After making ensign, he was sent

to Brooklyn, NY, to oversee production work on ships. In 1945, he married Lois Fahey Doty of Astoria, NY. He was then transferred to Portsmouth, VA, for underwater explosives testing on Navy ships. In 1948, he was sent to the Bureau of Ships in Washington, DC, for a research program in the development of welding procedures in the first nuclear submarine, the USS *Nautilus*. Frederick also received a degree in mechanical engineering from the Naval Post Graduate School in Monterey, CA, and an MBA from New York University. In 1963 he retired from the Navy, after serving for 20 years. While working for International Paper, he moved to Statesville and became active in the local Rotary Club and country club. He served as chapter president of the Rotary Club, was honored as a Paul Harris Fellow, and was named Rotarian of the Year. He enjoyed painting, golf, gardening, traveling, reading and Civil War history. He is survived by his wife of 63 years, Lois; his son, Larry; daughter, Ami Maples; two sisters; four grandchildren; and nine great-grandchildren.

CLINTON R. HOAGLAND '70 of Banner, WY, died on February 21, 2009. Clinton was born in Greeley, CO, in 1948. He graduated from Cherry Creek High School in 1966 and from the Colorado School of Mines in 1970 with a degree in geophysical engineering. Two years after graduating, he joined his grandfather in the ranching business and also became a real estate broker, owning his own company for the next 25 years. He was very active in his community, serving as president of the Elizabeth, CO, Chamber of Commerce, treasurer of the Elbert County Fair Board, president of the Kiowa Soil Conservation District, co-chair of the Elbert County Planning Commission and charter member of the Douglas-Elbert County Board of Realtors. At the time of his death, he was president-elect of Round-Up Riders of the Rockies. In 1995, he purchased the Banner Ranch in Banner, WY, where he continued in the ranching business. While living in Banner, Clinton served on the board and as president of the Big Horn Equestrian Center. He enjoyed outdoor activities, including pack trips to the mountains, fishing, hunting, and playing polo. Clinton is survived by his wife, Janet Hoagland; son, William Hoagland; and mother, Mary L. Hoagland.



R. W. "BOB" HOAGLAND '55 passed away on April 24, 2009. Born in 1925 in Towner, CO, Bob spent his younger years on the Wild Horse Corral and Cold Springs Ranch in Kansas, before moving to Loveland, CO, at the age of eight. When he was 17, he enlisted with the U.S. Navy and served in the Naval Air Corps' Air Group Six until the end of World War II, during which time he earned citations and commendations for meritorious and heroic service. In 1947, he married Marian Bader of Loveland, and she supported him while he completed high school and earned a professional degree in mining engineering from Mines. He was inducted into the Sigma

Gamma Epsilon honor society while at the school. In 1955, the couple moved to Carlsbad, NM, where Bob was a junior engineer with International Minerals and Chemical Corporation. Throughout his 37-year career, he advanced through many positions, ultimately retiring as a plant manager and senior vice president. He is survived by his wife of 62 years, Marian; his sons, Robert and Larry; his daughters, Donna Hougland Owen and Patricia Hougland Oliva; twelve grandchildren; and nine great-grandchildren.



LEONARD D. JONES '71 of Littleton, CO, died on February 14, 2009. Born in Cheyenne, WY, in 1948, Leonard earned a bachelor's degree in metallurgical engineering at Mines. During his years on campus, he became a member of Blue Key, Kappa Sigma, Sigma Gamma Epsilon, and Scabbard and Blade. In 1985, he received an MBA from Nova University. He also earned a master's degree in computer information systems from Regis University. His career included time working for the Army Corp of Engineers, Stauffer Chemical Company, Wisconsin Energy Corporation, the National Renewable Energy Laboratory, TCI, Qwest Communications and, most recently, Booz Allen Hamilton, where he served as a senior consultant since 2006. In addition, Leonard cultivated a keen interest in energy-efficient construction practices. He ran his own professional engineering firm, specializing in earth building, evaluating energy systems, designing sustainable buildings and helping with building permit applications. At his funeral, his daughters reflected, "Our father was the smartest person we knew. He taught us how to build a fence, how to change the oil in our cars, how to wire a shed powered by solar and wind power, how to build a Volkswagen engine from scratch, how to hot wire a tractor, how to piece together a computer tower, and how with Google and a stack of books, anyone can be an expert at anything." An outdoorsman, Leonard enjoyed spending time with his family, hunting, hiking, fishing, camping, snowshoeing and just walking the trails around their foothill community with his two Australian shepherds. He is survived by his wife, Sheila; his daughters, Shannon Fern and Meghan Tripp; his brother, Philip; and his mother, Mary Harden Jones.



HOWARD W. LEAF '50 of Aquasco, MD, died April 25, 2009. Howard graduated from Mines with a professional degree in geophysical engineering. While at the school, he participated in cross-country, and track and field. He went on to earn a master's degree in geophysics from St. Louis University in 1955. In 1984, he retired from his position as assistant vice chief of staff at the Pentagon with the rank of lieutenant general in the U.S. Air Force, ending a distinguished military career. During World War II, he served in the Army Air Forces, and in 1950, he joined the newly formed United States Air Force. He was a fighter pilot in the Korean and Vietnam wars. Howard's service earned him the Distinguished Service Medal, two Silver Stars, two awards of the Legion of Merit, two Distinguished Flying Crosses, the Meritorious Service Medal and 16 Air Medals. From 1961 to 1964, he worked in the Office of Scientific Research at the Pentagon. Later he was moved to Langley Air Force Base as deputy chief of staff for requirements; in the late

Alumni

Passings (cont.)

1970's he oversaw weapons testing at Kirtland Air Force Base in Albuquerque. He also served as the inspector general of the Air Force in the early 1980s, overseeing investigations, anti-terrorism and counterintelligence. In 1986, an award was created in his honor for officers and civilians in Air Force Inspection. After he retired from the Air Force, he worked for an engineering company in McLean, VA. From 1991 to 1997, he was a civilian director of the Air Force's Test and Evaluation Directorate at the Pentagon. He is survived by his wife of 53 years, Madonna; three daughters, Mary Beth Leaf, Barbara Leaf, and Anne Marie Moore; three sons, Timothy, Thomas and Daniel; 11 grandchildren; and his sister.



FARREST "GAIL" G. LOPER '60 of Medford, OR, passed away on February 27, 2009. After graduating from Riverton High School in Wyoming, Gail attended Mines, where he earned a professional degree in mining engineering. He continued his education throughout his career, earning a master's of engineering and business

from the University of Southern Florida, and an MBA from Harvard. Gail worked for IMC, The Foxboro Company, Honeywell, Allied Signal Aerospace Division and T-Systems, where he was CEO. He also served on many boards in various fields. The U.S. Department of Agriculture appointed him to the Continental Divide National Scenic Trail Advisory Council, and he served on the University of Arizona's Industrial Advisory Council. His personal interests ranged from motorcycle enduro racing, sailing and skiing, to the study of the bible, Roman history, woodworking and breeding quarter horses. Before retirement, he taught in the MBA program at the University of Phoenix. Recent passions included extensive research into the theory of global warming, and his woodworking shop, where he designed and crafted custom furniture. He is survived by his wife of 54 years, Dixie; sons, Michael and Tim; daughter Christine; one grandchild; and one great-grandchild.



RULON S. "MOE" MAHANNAH '47 of Kelowna, BC, died on July 14, 2007. Born in Fruita, CO, in 1923, Rulon grew up in Grand Junction and graduated from Mines with a professional degree in geological engineering. In the late stages of World War II, he joined the U.S. Air Force as a fighter pilot. After his service, he joined Shell Oil, and in 1953, he moved to Canada with his wife, Connie, and their children. Remaining with Shell for many years, he climbed the ranks to become vice president of Crowsnest Resources, Shell Oil's coal subsidiary. Rulon's interests included world events, politics, investing and playing pool. Recently he built a new home as an extension of his daughter's house in Kelowna, where he made sure there was ample space for his pool table, as well as a full-size workshop and a large garage. His daughter, Carol, writes, "He flew his own airplane and introduced me to the tips of the Rocky Mountains. He was a great outdoorsman, who enjoyed fishing in the Pacific Ocean in his Boston Whaler, and canoeing and camping with his family. He repaired cars and designed and welded wrought iron railings. He... built furniture, basements, closets and a sailboat. He was an avid gardener, specializing in tomatoes and two-

foot-long zucchinis. He was a computer whiz. Alas, he was not that good at dancing. Only my mother seemed to be able to follow his rhythm, which she did, with grace, for 56 years." He is survived by his six children, fifteen grandchildren and two great-grandchildren. He was predeceased by Connie.



SCOTT J. MARSHALL III passed away May 8, 2009. From 1954 to 1991, Professor Marshall taught electrical engineering at Mines. Deeply respected by colleagues and students alike, he began in the Electrical Engineering Department, which was later merged into the Basic Engineering group and then the Division of Engineering. He also taught surveying and computer programming classes. He was responsible for installing and housing the HP 3000 on campus. In 1955, he started the Mines golf team, which he coached until his retirement. He enjoyed the opportunity to not only play and teach a sport but also to engage with students outside the classroom. In his later years, Scott enjoyed traveling, bowling, fishing and reading. He was an active member of Calvary Baptist Church throughout his life, serving in numerous leadership positions, as well as singing in the choir and ringing handbells. He is survived by his wife of 63 years, Betty Rae; son, Scott; daughters, Sharon Becker and Pamela Tumler; one grandchild; two great-grandchildren; and his sister.



ROBERT "BOB" MERRITT '48 of Lakewood, CO, died on January 21, 2009. Robert was born in 1921 in Denver but spent much of his childhood in Houston and then San Francisco. During World War II, he trained to become a pilot, serving in the 8th Air Force and piloting a C-47. The Swedish government recognized his service upon the 50th anniversary of the end of the war. Bob graduated from Mines with a professional degree in metallurgical engineering. His first jobs took him to Pittsburgh and then Laramie, but eventually he returned to Colorado to work for the Colorado School of Mines Research Institute, a position he held until his retirement in 1984. He specialized in the field of uranium processing, work which took him to Eastern Europe and Peru. He wrote a book on the subject titled, *The Extractive Metallurgy of Uranium* in 1971, which is still used in the industry today. The Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers recognized Robert as a Distinguished Member. He met his wife of 59 years, Imogene Neff, on a blind date. Bob was an avid skier, camper, four-wheeler and fly fisherman. He enjoyed backpacking in the Colorado back-country into his 80's. He is survived by his wife; daughters, Catherine Merritt and Linda Burkhardt; son, Steve; four grandchildren and one great-grandchild.



KENNETH L. MORRISON '38 of Rawlins, WY, passed away on January 5, 2009. Born in Golden, CO, in 1917, Kenneth attended school in Greeley, CO, before returning to Golden to attend Mines. After graduating with a degree in petroleum engineering, he started working for Sinclair in East Chicago, IL, and then in 1943, he returned

to the West to work at the refinery in Sinclair, WY. Kenneth married Lois Frederick in Sinclair in 1945, before serving in the U.S. Army 1946 – 1947. After his military service, he resumed working for the Sinclair refinery. Kenneth was a longtime Cub Scout Master and was in the Toastmasters Club since its organization. He served as lay reader for St. James Episcopal Church for 20 years; he also served as lay reader and served on the vestry for St. Thomas Episcopal Church for several years. Kenneth is survived by his wife of 54 years, Lois; his daughter, Dorothy Morrison; his two sons, Gregory and Frederick; five granddaughters; and one sister, Anne Arnold.



FRANCIS O. MUELLER '53 of Kensington, CA, died on October 21, 2008. Born in Kansas in 1931, he graduated from high school in Ellsworth, KS, and then attended Mines, where he graduated with a professional degree in metallurgical engineering. He later earned a master's degree from the University of California-Berkeley. It was at UC Berkeley that he met his wife,

Joan. Francis worked for a variety of companies during his career, including Caterpillar, Atlas, Bechtel, SOHIO, BP, as well as a stint with the U.S. Navy. He was president of his local chapter of the American Society for Metals. He was passionate about designing and creating, leaving behind a home full of completed projects, and a basement full of works in progress. Francis is survived by his wife, Joan; sons, Steven, Wally and David; and one granddaughter.



JAMES H. OGG '52 of Arvada, CO, passed away on June 16, 2008. He was born in Montclair, NJ in 1927. After high school, he joined the merchant marines and traveled around the world. Two years later, he returned to Montclair, attending Newark Academy for one year before leaving to attend Mines. At Mines, he was a member of Sigma Nu

and the swim team. He graduated with a professional degree in geological engineering. After graduating, he was hired by Texas Gulf Sulfur in Houston and worked in mining operations in Acayucan, Mexico. He then helped develop a potash mine on the Colorado River near Moab, UT, and a soda ash mine in Green River, WY. In 1970, Jim was transferred to Denver. He later worked for the Louisiana Land and Exploration Company. He enjoyed the outdoors, and spent time in Alaska, the Northwest and the Colorado high country. He taught at Faith Christian High School for one year and was active in his church and politics. He is survived by his wife of 57 years, Ruth; daughters, Donna Graham and Jamie Wolff; sons, Glenn '85 and Barry; 19 grandchildren; and 10 great-grandchildren.



JEFF A. POTTS '92 of Littleton, CO, passed away on January 1, 2009. Born and raised in Grand Junction, CO, he attended Grand Junction High School, graduating at the top of his class. Following in the footsteps of his grandfather, John F. Peeso '48, Jeff enrolled at Mines, where he pitched for the baseball team. After

graduating with a bachelor's degree engineering – civil specialty,

Jeff worked for 16 years as an engineer, the last eight for the Town of Parker Public Works. Jeff's enthusiasm for sports led him to coaching Littleton's Heritage High School girls freshman/sophomore basketball team. In his eight seasons of coaching, he led his teams to multiple championships. He was an inspiring leader and mentor to many. When he wasn't coaching, he enjoyed biking, playing golf, baseball, basketball and spending time outdoors with his wife and children. Dedicated to his family, Jeff lived to watch his children learn and grow. He is survived by his wife, Kim; daughter, Katie; son, Trevor; parents, Ron and Susan; and his brother, Tim.

FRANK E. WEAGANT '51 of Dana Point, CA, died on May 1, 2008. Born in Denver in 1925, Frank enlisted in the Army during World War II and served in the 82nd Airborne. Following the war, he attended the California Institute of Technology before coming to Mines, where he earned a professional degree in geological engineering. Frank began his career with Standard Oil, and later joined Franco Western Oil as key technical advisor. Frank and a partner eventually formed an oil and gas exploration firm, Nahama and Weagant Energy Company, which operated in Bakersfield, CA. Frank was a longtime member of the American Association of Petroleum Geologists. During the past twenty years, Frank and his wife, Barbara, devoted much of their time to environmental preservation and education. He was an expert birder, taught geology at Saddleback College, trained docents for many Orange County parks and nature preserves, and was a constant supporter and volunteer for the Laguna Conservancy and Caspers Wilderness Park. In addition to being a scientist, entrepreneur, teacher, life-long learner and passionate environmentalist, he was deeply devoted to his family. He is survived by his wife, Barbara; their daughter, Trinka Burdick; and his brother, Bob.



JERRY F. WHALEN '49 of Billings, MT, passed away September 28, 2006. Jerry was born in Topeka, KS, in 1925, growing up on his family's farm on the Buffalo River near Anamosa, IA. In 1943, he enlisted with the U.S. Navy and served during World War II. After being honorably discharged, he came to Mines, where he joined the Sigma Nu fraternity and earned

a professional degree in mining engineering. On July 5, 1950, he married Ruth Wassen in Denver. The couple moved to Billings, MT, in 1964, where they raised their family. In addition to working for the Anaconda Copper Mining Company in Butte, Jerry worked for mining companies in West Virginia, Minnesota, Arizona, Colorado, Wyoming and Cuba. In 1960, he founded his own company, J.F. Whalen & Associates, specializing in mineral exploration, mining and heavy civil engineering construction. He took on a range of projects around the country, including mining, tunneling, dam silo construction, wastewater treatment plants, drainage, road, bridge and power plants. He enjoyed his work right up to the day he passed away. Jerry was an avid reader, who also loved the outdoors. He is survived by his daughters, Eileen Hatrick and Molly Whalen; sons, Bill, Cass and Tom; 12 grandchildren; two sisters, Winnie Micks and Kathryn Green; and his brother, Mike.

Also In Memoriam

Daniel Dellinger '31December 8, 1997
Mark Theodore Gilkison '36 March 2, 2003
Randal A. Houdobre '66 November 22, 2006
Charles M. Mallette '52 May 18, 2008
Herbert Reuben Nye '31 April 1, 1988
Eugene A. O'Brien '53 May 29, 2008

Robert A. Pond (CSMAA Honorary Member) .. February 18, 2008
James E. Schroeder '80 November 12, 2006
Harold E. Sebastian Jr. '66 February 26, 2007
Glenn A. Walton '60 August 28, 2008
Robert G. Wilson '52 January 15, 2008
Christian F. Wyller '58 June 30, 2003



For the summer issue Mark the Spot, describe the exact location of as many of these as you can and send your answer to magazine@mines.edu. Put "Mark the Spot" in the subject line, and indicate local or out-of-town.

Mark the Spot

Many thanks to all those who participated in the spring issue's Mark the Spot—the photo of Golden circa 1860. The winning entries are included below. The clear out-of-town winner is **Eric Peterson '82**. As for locals, **Jerry '61** and Elaine **Ilgenfritz** tied with **Warren Andrews '63**. The Ilgenfritz correctly put the photographer to the east side of Washington Ave., Warren correctly puts the photographer some way down the hill. (The relative heights of the mountains to the west change as you descend the hill. From 15th and Washington, they don't tally with the old photograph.) *Mines* magazine's official answer is 30 yards uphill from 14th Street, and 15 yards east of Washington Ave. Challenges welcome!

Thanks for playing. The winners receive a Colorado School of Mines history book—appropriately enough.

The photo was taken on the east side of Washington Street, between 15th and 16th, looking NNW. The giveaway is the old Territorial Capitol building on the west side of Washington and the curve where S/B Washington turns onto 13th. Fun contest! Thanks.

Eric F. Peterson '82
Newhall, CA

The photograph of Golden circa 1860 was taken from near the top of the Washington Avenue hill looking north, near the north edge of the block where the original Jefferson County courthouse was later built.

Warren Andrews '63
Golden, CO

My wife, Elaine, and I believe that the photo was taken from atop what old timers refer to as "Courthouse Hill" on the east side of what is now Washington Ave., across the avenue from what is now the Foothills Art Center. ... The "Avenue" is the wide street center. On the west side of the street is the Loveland Block (Territorial Capitol) now the Capitol Grill, erected in 1863. Immediately west of the Loveland Block is the Astor House, erected in 1867, with 5 windows and its balcony. Both help to date the photo.

Jerry '61, and Elaine **Ilgenfritz**
Golden, CO

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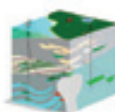
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Friday, October 2, 2009

8:30 a.m. Shotgun Start

Redlands Mesa Golf Club

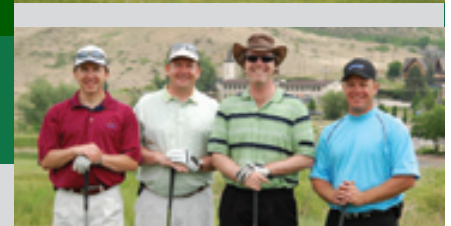
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