

HOMECOMING 1990



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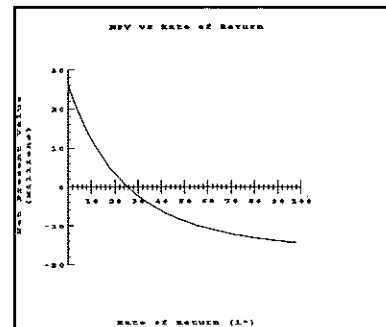
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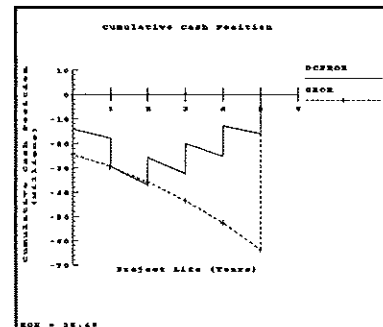
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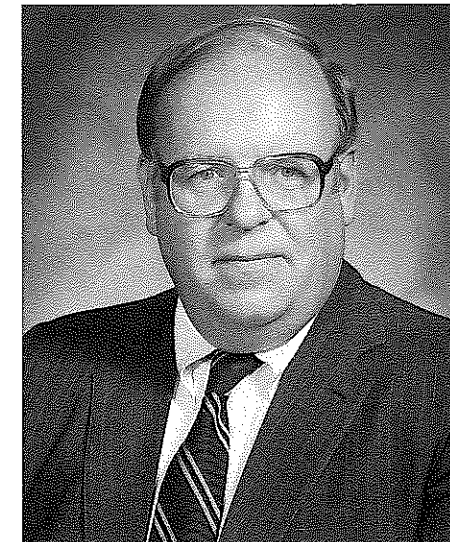
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**MINING AND THE ENVIRONMENT:
A RETROSPECTIVE**



BY STANLEY DEMPSEY
CHAIRMAN AND CEO, ROYAL GOLD, INC.

“... we need real technical solutions, and we will be looking to technically trained people to provide answers.”

Prior to 1970, most mining related environmental problems involved conflicts with competing economic interests. When silt ruined crops and threatened to fill up San Francisco Bay, California agricultural interests put a stop to hydraulic placer mining in the Sierra Nevada gold regions. Colorado farmers brought nuisance suits against gold mills that released tailings into streams in the 1930s. And there are plenty of stories about “smoke farmers” who made more money from damage claims against smelters than from growing vegetables.

Litigation brought by private parties was based on the common law theory of nuisance, and there were few governmental controls of air or water pollution or of waste disposal. Miners did not need permits from the government, and citizen pressure groups were non-existent.

All that changed in 1970. The political turmoil of the 1960s, which reflected public dissatisfaction with the war in Vietnam, civil rights issues, distrust of established institutions, and concern about environmental damage to the nation's land, water and wildlife, particularly involved demands for more say by citizens in decisions affecting the environment. Courts started allowing more citizen involvement in decisions of the government agencies and citizen pressure groups were able to stop important public works projects. At the very end of the '60s, Congress passed the National Environmental Policy Act of 1969 (NEPA) and the phrase “environmental impact state-

ment” (EIS) was added to our national lexicon.

NEPA went through Congress with little opposition or debate. Industry thought it was a harmless statement of policy that everyone could endorse. That view vanished when a United States circuit court halted construction on a major power plant pending preparation of an EIS. NEPA had teeth.

NEPA established a broad national policy of protecting the environment and mandated procedures for assessing environmental impacts of federal actions. Court decisions implementing NEPA forced agencies to consider alternative proposals, including a “no-action alternative.” Despite the far-reaching impact of NEPA on the mineral industry, NEPA, in and of itself, did not seek to impose “command and control” kinds of regulations on the mining industry. Those regulations came during the decade of the '70s.

Pressure groups formed during the '60s were not satisfied to rely on state and local governments to adopt and enforce environmental laws. They feared that local authorities would succumb to arguments of economic interests to weaken laws and their enforcement. They wanted federal laws, and for the most part they won. The Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, and the Surface Mining Control and Reclamation Act were passed by Congress during the '70s. The states retained some involvement, as in administration of the discharge permit (NPDES)

system under the Federal Water Pollution Control Act Amendments of 1972, but the real power to make and enforce environmental regulations shifted to the federal government.

The period since the '70s has been characterized by rule-making required to implement the major environmental statutes, and by enactment of laws mandating clean-up of old waste sites. Rulemaking generated thousands of pages of regulations that made the Internal Revenue Code look simple, and dozens of court decisions have interpreted and enforced the new statutes.

The search for a regulatory approach to old sites led to enactment of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), better known as Superfund. It puts the federal government into an active clean-up role, and uses strict liability theories to force people to pay for clean-up of old sites.

In addition to the major environmental statutes, a number of mining specific environmental regulatory schemes came into effect during the '70s. The Federal Land Policy and Management Act calls for environmental considerations in decisions effecting public lands, and both the Bureau of Land Management (BLM) and the Forest Service developed surface management regulations which require filing of notice of activity or plans of operation with the land managing agency involved when exploration or mining operations are conducted on mining claims.

While all of this activity was going on at the federal level, states and local governments have also been at work, and numerous issues of exclusive versus concurrent jurisdiction have arisen. Until recently, federal agencies dealt with surface impacts on mining claims, the states controlled reclamation of mined private land, and zoning was a local concern. Lately, however, conflicts have arisen between federal and state authorities and between state and county authorities. Arguments over who controls the miner have gone all the way to the Supreme Court of the United States, but the matter has not yet been fully worked out and is not likely to be settled any time soon.

The big issues of the early 1990s are increasingly stringent water controls, including attempts to regulate impacts on the

quality of ground water, attempts by the EPA to establish a mine waste regulatory scheme under RCRA, tougher state and local reclamation requirements, cumulative impact statements under NEPA, incredibly expensive superfund clean-up and liability litigation, and increasingly bitter battles between mine proponents and local citizens and local governments over the "NIMBY"—*Not in My Back Yard* issue.

Mining industry reaction

Mining was hit early and hard by increasingly stringent environmental regulation. For years, historic mining operations had minimized and externalized the cost of waste management by dumping residuals into the commons—the air, lakes, rivers and oceans. As public demands for new laws escalated, the industry responded in two ways: first, by lobbying to slow down the imposition of expensive new controls and, second, by developing new technologies for controlling environmental impacts.

For the most part, the mining industry's approach to lobbying was reactive, and the battle was fought in rear guard actions meant more to slow down the inevitable defeat than to retake any grounds. The power of the environmental lobby proved overwhelming and it was only through hard work that the industry was able to buy some time for rational treatment of mining wastes under the Resource Conservation and Recovery Act (RCRA) (mining wastes were exempted pending a study of how they should be regulated), and to keep reclamation regulation for hard minerals at the local level.

The industry also deserves credit for some important proactive moves, such as its cooperation with the Forest Service and environmental organizations in formulating surface management regulations that provided effective environmental controls with due regard of the legitimate requirements of explorers and mine drilling.

Likewise, the industry has won some important victories in the rulemaking arena, and it has done so by trying to be positive and by promoting regulations with good scientific backing. But it also must be said that a lot of the industry's efforts have been to no avail. The present system of lawmaking does not provide much opportunity for positive industrial partici-

“. . . the 1990s will see increasingly bitter battles between mine proponents and local citizens and local governments who are yelling 'Not in My Back Yard' . . .”

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Environmental legislation has typically been initiated by pressure groups and their allies in Congress. Environmental organizations and academics provide a scientific and economic rationale for a bill, propose a regulatory mechanism, and industry becomes involved only after the issue is relatively mature. Industrialists, forced into a reactionary position, have little opportunity to reason with opponents and to offer constructive solutions to problems. And there are no economic incentives for today's industrialists to become creative in solving inherited problems. There are no subsidies for cleaning up the commons—land, air or water—beyond what is mandated by law.

Miners tried to persuade legislators and regulators that economic issues should be considered in environmental law-making, and that permitting delays, expensive retrofitting of plants, and last increment contaminant removal were the kinds of economic issues that should be addressed. But they ran into demands for protection of health and other public values such as wilderness, scenic vistas, and endangered species protection and lost the battle.

On the technical front, miners responded quickly to new regulation, particularly of air and water pollution. The first steps involved big environmental gains at little cost. Smelters tried intermittent control strategies, slowing down production during periods of poor natural air quality. Primary aluminum plant operators hooded their Hall process cells and passed the fluoride rich gas stream through incoming ore, achieving a high degree of fluoride recovery. Bag houses placed on some process plant stacks recovered previously lost products that paid for the bag house in weeks. But the next increments were harder and costlier to achieve, and the law sometimes drove technology to do things that seemed commercially wise at the time, but not when viewed from a broader perspective.

Avoiding regulatory expense

It became popular during the '70s and early '80s to close up water systems to avoid EIS preparation. In cases in which the only exposure to NEPA came by way of a discharge permit, it sometimes made practical sense to spend extra money recycling and treating wastewater to avoid the expense and the delay of an EIS. Some of these closed systems were expensive and wasted energy and reagents where treatment was required, and sometimes lost product through decreased metallurgical recovery because of build-up of contaminants, but they were built nonetheless to avoid the risk of exposure to the cost and uncertainty of NEPA review.

Over the years, technical solutions to environmental problems have increasingly been driven by command and control regulations which established standards, and told the miner how to meet the standard. And with the legally mandated progression from technology-based water pollution standards to health-based standards, technology has been pushed to achieve high levels of containment removal without real attention to the relationship of cost to benefit.

The industry's reaction on both the public policy and technical fronts has necessarily been reactive and somewhat de-

fensive. The policy initiative has been with environmental pressure groups, and even government has had a hard time staying up with citizen activists. Environmentalists serve up the ball, and it is all that industry and government can do to just keep from getting hit by it, let alone hit it back over the net.

In retrospect, it seems clear that we have not yet reached a national consensus on how to manage the environmental impacts of mining in the United States. The nation is spending a lot of money on environmental clean-up, but much of that money goes to lawyers and public relations firms. Agreement on ways to manage the environment and actual physical clean-up of waste sites continue to elude us.

Environmentalists have been extraordinarily successful at gaining widespread public acceptance of the legitimacy of their goals. Public opinion polls and the behavior of elected officials make it clear that much of the public has bought into clean air and water, reduced congestion, and protection of wilderness and other quality of life values.

Environmentalists have been less successful in gaining the cooperation of economic interests, and in developing effective ways of getting people to do things in better ways. The regulatory system just does not work very well because the people being regulated do not agree with the system.

Economic interests like industry and municipalities have not accepted the legitimacy of many environmental goals and are particularly resistant to negative command and control-type regulation aimed at achieving those goals. Such interests have a hard time accepting some environmental approaches because to do so would be to internalize costs they cannot handle; said another way - they cannot buy into programs that will put them out of business.

Most regulatory schemes set standards and mandate performance upon penalty of fines or imprisonment. The process is adversarial and both sides use lawyers to work out the details of compliance. Lawyers tend to be pragmatic problem solvers who value short term victories and who are used to employing adversarial mechanisms to get results. The American legal system works well for solving some kinds of soci-

"Freed of the fear of fines and imprisonment, the regulated community will be interested in system approaches to all aspects of mining and the environment."

etal problems, but it has some shortcomings when applied to matters such as environmental quality. The system imposes political solutions to technical and economic problems and there is little collaboration between regulators and members of the regulated community. Science takes a back seat to

politics. The only incentives are negative. If you behave as you are told, you do not get fined or jailed. Science becomes suspect in the adversarial setting. There is no positive encouragement for economic interests to do more than is required. No one gets a bonus for doing a better than average job, and more money may be spent on lawyers than on environmental clean-up.

If one is optimistic about the future, it is safe to predict that the United States will eventually sort out a more satisfactory approach to environmental management and regulation. The public is likely to continue to endorse environmental quality goals, but they will eventually become dissatisfied with the poor results and high cost of current environmental

regulatory approaches. The public will demand that we get on with the clean-up and end the wasteful litigation that characterizes the current situation. And they will start to employ market-oriented incentives to secure better environmental approaches.

If this occurs, and I believe that it must, technical people will be encouraged to come up with effective mechanisms for managing environmental impacts of mining. Freed of the fear of fines and imprisonment, the regulated community will be interested in system approaches to all aspects of mining and the environment. We will be less interested in meeting or beating a particular standard than in developing an overall approach to siting issues, to management of mining and process residuals, and to pre-disturbance planning for ultimate reclamation. Hopefully, the technical community will become more effectively involved in environmental management and we will be able to do a better job of securing the nation's environmental goals.

We are also likely to see some kind of a resolution of the "NIMBY" problem. Better legal mechanisms are available for sorting out the siting of mining facilities in areas that have other high quality land use attributes. European precedents offer a good place to start the search for more sensible dispute resolution mechanisms. Technical solutions to problems of noise and blasting damage, and the management of residuals and of visual and socio-economic impacts will make it

possible to develop mines in and adjacent to parks and settlements. Here again, we need real technical solutions, and we will be looking to technically trained people to provide answers.

Stanley Dempsey has been continuously involved in mining industry environmental matters since the 1960s. He was one of the organizers of AMAX's successful "Experiment in Ecology," a program of cooperation between company officials and environmental activists in developing the environmental plan for the Henderson Mine in Colorado. The "experiment" attracted awards and worldwide press attention as a pioneering effort in the mining and environmental field.

Dempsey, a geologist and lawyer, was named director of environmental affairs for AMAX in 1970, and vice president, environmental affairs in 1977. He practiced law with the Denver and Washington law firm of Arnold & Porter from 1983 to 1987. He is currently chairman and chief executive officer of Royal Gold, Inc., and chairman of Denver Knight Piesold Environmental Consultants, Incorporated. He has been particularly active in mining industry efforts to influence environmental regulation, and in developing innovative ways of managing the impacts of mining. He has also been active in the management of environmental conflicts and in securing community acceptance of mining projects.

Dempsey is uniquely qualified to provide a retrospect on the regulation of the environmental impacts of mining, and to suggest how technically trained mining people can contribute more to the process in the future. ▲



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For some people the idea of working for Godiva Chocolatiers of New York is a slice of heaven. Where else could you sample carefully crafted chocolates wrapped in gold foil? For Ann Hanson, a 1981 graduate of Mines, the assignment in the small company's product development office is "dangerous . . . it's a good thing I run."

Hanson's background is in geophysics; she says she chose Mines for the best education possible in that field.

"I worked for Amoco for three years following graduation, but I found I didn't like the nitty gritty of the job. I used the time to figure out what it was at Mines I liked and how I would make a transition to something else. One of the things I did at Mines was promote a movie series, it was my first foray into marketing. I enjoyed the management aspect of those extra activities—management, leadership and marketing, and that seemed to point to a different direction," she remembers.

Ann looked into law and business schools, but after taking an energy law course in Louisiana she found it didn't suit her. Marketing seemed more practical or tangible so she applied to the nation's top business schools.

"Just as Mines is respected as the leading school for mineral resources engineering, and just as a Mines degree opens doors for graduates, so does a degree from a well-respected business school. I sought a school with a very specialized program (like Mines) which would be recognized among business executives. Northwestern University's Kellogg Graduate School of Management offered a master's degree with emphasis in marketing and transportation which was a good place to make a transition from engineering to marketing," she said.

With Chicago as an industrial and transportation hub, Hanson was introduced to the transportation industry, especially the airlines. While at Northwestern she served as an assistant to the research director of the university's transportation center where she met high level executives in industry who recounted their experiences to graduate students. "Their conversations told us what it took to be a good manager, and reminded me that they are people too. It (the degree) gave me a solid foundation for working in marketing, and an entry card to better businesses."

Hanson says it shouldn't come as a surprise to anyone that she changed careers; she knew she would have to continue her education in some way. "We're

A Chocoholic's Dream **MINES ALUM "TESTS" NEW PRODUCTS FOR GODIVA CHOCOLATES**

all over-achievers at Mines so going to graduate school and into marketing isn't unusual. I like being in management, not just technical management," she added.

Flying off to the "Friendly Skies"

From Northwestern University Hanson headed off to United Airlines to become a corporate planning as-

sociate where she evaluated competitive strategies in West Coast and trans-Pacific markets. But after only three months she was in for a rude shock—she was laid off. "It was a surprise, and I learned no matter how well planned things are, the best plans can fall apart. All of my best friends from Mines have been laid off through the mineral industry at one time or another, but you don't expect it to happen to you," she said.

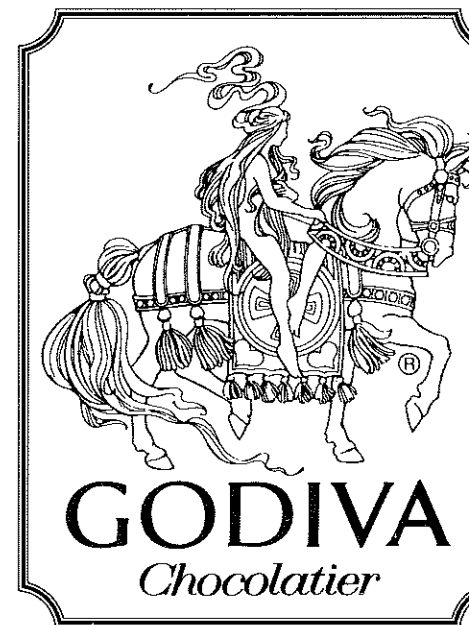
Hanson, who describes herself as motivated and organized, was only out of work two months, but the experience impressed her. She accepted a job as an assistant product manager for Best Foods and worked with Mazola brands developing all consumer and trade promotions. After two years with the large food company, Hanson said she wanted to return to the airline industry to see if she liked marketing in her specialty.

"The move to Best Foods put me back on my feet, but I wanted to work for an airline. I found a job with American Airlines in Dallas marketing food and beverages through in-flight services, and managed a few promotions there," she said.

Hanson has crisscrossed the country in her career—from Golden, to New Orleans, Chicago, New York, Dallas, and now back to New York. She enjoys traveling, and says she is one of the few New Yorkers who actually gets out to the cultural attractions of the Big Apple.

"I live five minutes from the Empire State Building and like running around the town in the morning. I cook for myself, an unusual trait for people around here, but I miss *real* grocery stores like Safeway or King Soopers—New York grocery stores are small corner stores with high prices and limited selection," she laughed.

Hanson has been with Godiva since May and says she has an advantage over other people because she can talk in technical terms to the technicians. "I immediately bring up my engineering background so people know I can speak in their terms, and often I act as a translator between chemists, engineers and less technical people.



"A news release was being prepared to inform people about chocolate and Godiva, but it was too technical. I served as a liaison between the technical section and newspaper readers—as a former engineer I understand the problem and as a marketer I can interpret it," she explained.

While there aren't tea carts loaded with fresh samples of Godiva Chocolates served every afternoon at the corporate offices, Hanson says working for a small firm is interesting especially on new product development and packaging. And yes, she does get to taste the latest liqueurs, cookies and candies, but she is "sworn to secrecy about new things. You'll have to visit your local Godiva store or dream over a catalog." ▲



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Colorado School of Mines and Asarco face a common challenge in the 1990's: to provide the earth resources needed to improve the quality of life for

more of the world's inhabitants. We now are called upon to generate and disseminate the knowledge and expertise required of responsible stewards of the earth and its resources.

Asarco Foundation is pleased to join Colorado School of Mines in meeting the challenge of the 1990's. It's our way of saying "thanks" for a valued partnership in our commitment to Colorado.

September 1990

Asarco Globe Plant — Asarco Leadville Mine

CSM's academic plan aimed at greatest needs

An on-going debate over the future direction of academics at Mines has resulted in a preliminary draft report which attempts to outline the school's need for the next three to five years. Faculty, administrators and students have participated in the debate which has centered on how to best use limited resources.

Colorado School of Mines's (CSM) academic plan is an outgrowth of Trustees Conference, held June 7-10 in Allenspark, Colorado, where some of the various constituencies which make up CSM, met and explored how they can work with the administration, the Board of Trustees and each other to the overall benefit of the school and its students.

During the conference representatives of each constituency—the Faculty Senate, the department heads, the Alumni Association, the CSM Foundation, and the visiting committees—made presentations, held a forum on the relationships between the groups, and later worked in small groups to identify several key points.

A major issue emerged from the conference—the school's capital campaign. A perception that the school has poorly communicated its goals for the campaign was voiced by one committee, and based on the committee's discussions, most of the campus constituencies feel that the capital campaign needs identification, which should come from an academic plan, a table of needs driven by the academic plan, a concise case statement and a financial plan.

Participants also felt the order of priorities should be stated, and faculty should be given the opportunity to participate in the development of new objectives or in the review of existing campaign objectives.

The group felt that the Academic Planning Council, the faculty members responsible for setting the school's course, through its blanket invitation to participate in deliberations, was a positive step toward achieving this goal; but misconceptions about the campaign may still exist because of a perceived lack of early-on communication about the goals of the campaign.

Since the Trustees conference efforts have been made to get out more information on the capital campaign, and in August Vice President for Academic Affairs and Dean of Faculty Frank Schowengerdt released a draft of a five-year academic plan.

Features of the Plan

The academic plan can be summarized as having four major areas of consideration—growth opportunities, leadership opportunities, further studies and infrastructure.

GROWTH OPPORTUNITIES for both undergraduates and graduate students can be defined as areas where additional investment is needed. The Engineering Department is perceived as having the greatest need because "it now has nearly 40 percent of the school's undergraduate majors. Its faculty is overloaded, its classes are crowded, and much of its laboratory equipment is substandard. Resources will be directed toward correcting these problems and improving the quality of education offered by the department" according to the draft summary of the academic plan.

Innovative educational programs, or refocusing attention on excellence in undergraduate education is also included in growth opportunities. "The committee feels we must come up with new approaches to integrated education for our students. We cannot just turn out specialists. Our graduates must be versatile to handle an ever-changing world," Schowengerdt said.

Dr. Phil Romig, head of the geophysics department, has said that the school needs a strong engineering department to support the central mission of CSM, and that all the university's departments depend upon that.

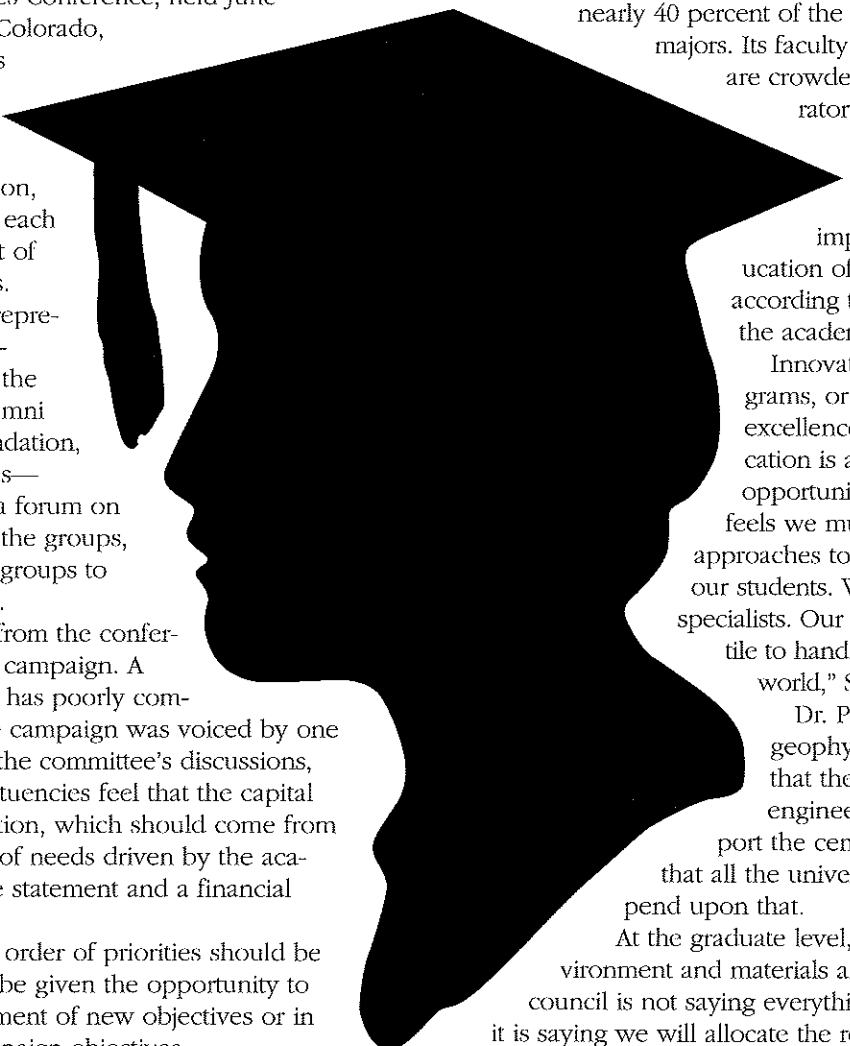
At the graduate level, issues involving the environment and materials are the top priorities. "The council is not saying everything else will be dropped, it is saying we will allocate the resources to build those two areas. Other areas such as exploration will continue to be targets for external funding opportunities," Schowengerdt said.

All departments are being asked to update their five-year plans within the framework of the overall plan. The council is meeting with department heads to hear about their needs and address faculty concerns through frequent meetings.

LEADERSHIP OPPORTUNITIES

By leadership the council is referring to areas where Mines has strength: exploration, extraction and production, and fuels and energy. These are areas that are currently doing well and attract outside investments (corporate donations), but should not be allowed to slip from their existing position.

(continued on page 14)



SECTIONS

by Mary Jo Giddings, Associate Director, Alumni Services

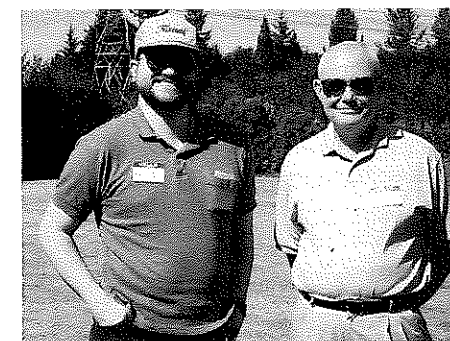
SEATTLE

Thirty members and guests of the Pacific Northwest Section met at the home of Virginia and Bob Kerwin '53, Sunday, August 26, for their annual salmon and chicken barbecue. At that time, Nelson King '72 was selected as the new section coordinator. Nelson tells us that he thinks he won because he was the only new guy at the summer meeting—next to Russ Wood. "Since I work for Russ, it's obvious as to the outcome—I won!" We welcome Nelson and know he will do a good job.

Nelson thanks Virginia and Bob "for a decade of hosting summer BBQs"; Jan and CSMAA Executive Director Norm Zehr '52, and Lyn and CSM Trustee Russ Wood '49 "for attending and presenting Mines' updates"; Ada and Al Nesbitt '38 "for the special CSM notecards and postcards" they brought for everyone, and "all the ladies for making the now symbolic Pacific Northwest Carrot Cake Dessert—what a delight!"

Other guests included Keith '60 and Annette Anderson; Dick '55 and Sylvia Barnes; Bob '60 and Katie Cederstrom; John Coats '57; Bill Cooke '53; Lou De Goes '41; Nelson King's wife Debbie; Bill '85 and Mona Moyer; Sid '54 and Ruth Peyton; and Mr. & Mrs. Dave Shirley & child.

Our special thanks to Bill Moyer '85 who served as Pacific Northwest section coordinator last year. We appreciate Bill's service to the association and the school.



Past Section Coordinator Bill Moyer '85 with host Bob Kerwin '53. (Photo by N. Zehr)

RENO

Section Coordinator Jim Bright '52 called to say that 22 alumni attended a breakfast meeting at Bally's September 11 in conjunction with Gold Tech 4, sponsored by Society for Mining, Metallurgy and Exploration, Incorporated.

GRAND JUNCTION

Ted Goudvis '40 hosted his "second invitational" picnic at his home in Aspen on September 16 for 20 Grand Junction alumni and guests. Section secretary Frank Woodard '42 wrote to tell us that everyone had a wonderful time . . . Ted was a great host . . . the food was fabulous . . . and "the golden colors on Castle Creek supreme."

Guests attending included John '34 and Eloise Barnes; Russell Cutter '49; S.M. del Rio '28; Dick Dewey '43; Joe '37 and Ellen Hopkins; Section President Owen '42 and Margaret Kingman; E.E. '47 and Gladys Lewis; John Peeso '48; Tony '32 and Kay Setter; Everett '40 and Bea Sherbondy; and Section Treasurer Dick '59 and Jo Swerdfeger. John Wright, chairman of the Colorado Plateau Section of AIME, came as Frank Woodard's guest and also acted as photographer.



Grand Junction Section:

Frank Woodard '42 presents a case of Colorado Cellars wine, a Palisade product, to host Ted Goudvis '40. (Photo by John Wright)

HOUSTON

The Houston Section of the Colorado School of Mines had 19 members at their September meeting and 29 members at their October meeting. A six month schedule of events was prepared by section coordinators Steve Rasey '78, '81, Chuck Russell '54, and John Turley '65 and mailed in early Oc-

tober to all Houston alumni. If you wish to be added to the Houston calling list or if you wish additional information about Houston's monthly meetings, call 713/726-9477.

DOWNTOWN DENVER

Roger Hutson '82 and Claudia (Fonio) Rebne '84, '86 are the new coordinators for the Downtown Denver Section. Their goal is to have a breakfast meeting every month at the Petroleum Club.

Twenty-six alumni and guests attended the October 9 meeting to hear Tom Petrie of Petrie Parkman & Company discuss "Implications of the Current Gulf Crisis for U.S. Petroleum Economics." Tom, a prominent oil analyst with extensive involvement in energy and investment, responded to a lively question and answer period following his talk. Roger and Claudia have their next section meeting scheduled for November 19. For additional information call Roger at 303/292-2322 or Claudia at 303/298-9700.

DENVER WEST

The Denver West section, under the direction of new section coordinator

Dan Witkowsky '66, met for breakfast on October 10 at the Sheraton Hotel in Lakewood. Thirty alumni and guests thoroughly enjoyed listening to retired CSM Athletic Director Fritz Brennecke as he made some personal reflections based on his 22 years of coaching the Mines football program. Dan also invited Joanne Lerud, director of the CSM

(continued on page 14)

COLORADO SCHOOL OF MINES

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CALENDAR

November 15

SOUTHEAST DENVER ALUMNI — LUNCHEON MEETING. Speaker: Dr. Frank Schowengerdt, CSM Vice President of Academic Affairs. Hilton Hotel at I-25 and Orchard Road; 11:30 cash bar; noon lunch. For reservations call Section Coordinator Noelle Sears (BSc. Eng. '86) at 303/779-0576 by November 13.

November 19

DOWNTOWN DENVER ALUMNI — BREAKFAST MEETING, The Petroleum Club, 555 17th Street; 37th Floor; 7:00 a.m.; \$10. Speaker: Sam Zakhem, former U. S. Ambassador to Bahrain; currently presidential advisor on the Middle East; limited seating; reservations required. RSVP Alumni Office 303/273-3290; Roger Hutson (BSc. Geol. '82) 303/292-2322, or Claudia Rebne (BSc. Geop. '84; MSc. Geop. '86) 303/298-2344.

November 27

NEW JERSEY/CONNECTICUT ALUMNI — DINNER MEETING, 7:00 p.m.; Red Barn, Westport, Connecticut; Speaker: CSM Executive Director Norm Zehr. RSVP the office of Kurt O. Linn '52, 203/968-5165.

November 28

NEW YORK AREA ALUMNI — A GET ACQUAINTED DINNER PARTY. Cocktail 6:30 p.m.; dinner 7:15 p.m.; \$35 per person. Montclair Golf Club, West Orange, New Jersey. Speaker: CSM Executive Director Norm Zehr. RSVP the office of Newell Orr '54, 201/228-9394.

Dec. 3

TUCSON ALUMNI - LUNCHEON MEETING. A 12:15 p.m. luncheon in conjunction with Arizona Section Conference of AIMF; social hour at 11:30; for reservations/information call Gordon Wieduwilt (Geop. E. '53) 602/326-8619.

Dec. 4

DENVER SECTION HOLIDAY PARTY, Denver Athletic Club. Speaker: Marv Kay (E.M. 1963), CSM head football coach; assistant athletic director; and mayor of Golden; Cash bar 11:15 a.m.; lunch 12:00. RSVP Alumni Office by November 30. \$15.

December 5-7

NORTHWEST MINING ASSOCIATION CONVENTION, Sheraton-Spokane, Washington. Alumni Breakfast *Friday December 7,* 7:00 a.m.; \$10. Speaker: Russ Wood '49, Member of the CSM Board of Trustees. Call Alumni Office for reservations.

December 13

CSMAA BANQUET FOR GRADUATING SENIORS, Green Center. Social hour, 6 p.m.; dinner 7 p.m.

December 13

HOUSTON ALUMNI - SIT DOWN LUNCH, Marathon Oil, 10th Floor 11:30-12:30; \$13; no speaker; RSVP 713/726-9477.

1991

January 9

DENVER WEST ALUMNI — BREAKFAST MEETING, Sheraton Hotel, 360 Union Blvd. Breakfast buffet 6:30 a.m.; program 7:00 a.m.; \$8.00. Speaker: Dr. George Krauss, director of CSM Advanced Steel Processing and Research Center; for information call Section Coordinator Dan Witkowsky, (Met. E. '66), 303/236-5202.

January 10

HOUSTON ALUMNI - POST HOLIDAY SOCIAL, The Roof, Westin Oaks, Galleria. 6:00 p.m.; \$2 happy hour buffet; RSVP 713/726-9477.

January 24

ALUMNI NIGHT WITH THE DENVER NUGGETS VS. THE NEW YORK KNICKS. Tickets \$12; doors open 6:00

p.m.; game starts 7:30 p.m. Reservations required by January 17.

February 14

HOUSTON ALUMNI - SIT DOWN LUNCH, Holiday Inn, I-45 North. 11:30-12:30; \$11; no speaker; RSVP 713/726-9477.

February 27

CSMAA ANNUAL MEETING in conjunction with CMA/SME ANNUAL MEETING AND EXHIBIT. Denver/ Hyatt Regency; Alumni breakfast 7:30 a.m.; \$11. RSVP 303/273-3295 by February 25.

March 14

HOUSTON ALUMNI - SIT DOWN LUNCH, Holiday Inn, Galleria. 11:30-12:30; \$11; no speaker; RSVP 713/726-9477.

March 15

ALUMNI NIGHT WITH THE COLORADO SYMPHONY AT BOETTCHER CONCERT HALL. 6:30 p.m.; concert followed by buffet dinner; details to follow.

April 4-6

E-DAYS AT CSM

April 10

DENVER WEST ALUMNI - BREAKFAST MEETING, Sheraton Hotel, 360 Union Boulevard. Breakfast buffet 6:30 a.m.; program 7:00 a.m.; \$8. Speaker: Dr. Eul-Soo Pang, head of Global Systems and Cultures Department and director of CSM International Institute; for information call Section Coordinator Dan Witkowsky, (Met. E. '66), 303/236-5202.

April 20

PHOENIX ALUMNI - TAX HARDSHIP PARTY. Coordinated by Tom Warfield '52; details to be announced.

(continued on next page)

CSM's Academic Plan (continued from page 10)

FURTHER STUDIES

The council has identified a number of academic issues which require further study. These include the humanities and social sciences component, the technical core, hour requirements at both the undergraduate and graduate levels, the summer field session, and special programs and continuing education.

"Outreach programs may be one of the most promising areas for expansion in the next decade. Extensive restructuring in the resource industries, coupled with the growth of environmental activities in industry and government, has resulted in large pools of non-traditional students. It is likely that the expected cutbacks in the defense industry will add to those pools. Mines can and should take advantage of these developments by providing educational opportunities beyond normal class schedules and locations. Recent successes with on-site courses at the Rocky Flats school and Martin Marietta have revealed the potential for such programs," the report states.

INFRASTRUCTURE

According to the council's report certain generic support issues need to be addressed. First among these is the issue of faculty salaries. According to recent studies on the Mines campus and elsewhere, faculty salaries at CSM are at least ten percent behind comparable national averages. As part of this plan, a new system for converting evaluations into raises will be defined. This system will be keyed to performance and has the potential for achieving parity with standard national salary curves.

Other important support issues addressed in the plan include laboratory equipment, research analytical facilities, the library, and computing capabilities. The council believes the solutions to many of these problems lie with the upcoming capital campaign.

Responding to a challenge

There is no question that to prosper and grow in the next decade Mines will have to agree on an academic plan which is in tune with society's needs. The Academic Planning Council has voiced this challenge: to provide the resources needed to create a better quality of life for more of the world's inhabitants while minimizing further damage to an already strained environment.

The school survived the slump in the oil industry in the 1980s and the resulting loss of revenue; programs remained basically intact and students continued to enroll. But a large question still looms over the campus—how can a small school in need of laboratories, professors, equipment and expanded facilities attract major contributions in a tightening economy? That is what is facing Mines in its deliberations, and it's probably one question that won't be answered any time soon. ▲

Sections (continued from page 11)

library, to speak to the group about current library practices. The Denver West section will meet again January 9. For more information call Dan at 303/236-5202.

ALASKA

My apologies to Section Coordinator Steve Enger and the following members of his committee whose names were omitted from last month's article about their very special alumni/student get-together on June 6: Sylvia Botello '89, Mehrdad Farkhan '88, Steve Freeman '81, Beth Mensing '89, and Darien O'Brien '83.

If you have news to share about your section (PHOTOS, TOO!) or would like to help us organize an alumni section in your area, please write or call Norm Zehr or Mary Jo Giddings; inside Colorado 1-800/245-1060 ext. 3296 or 3290; outside Colorado 1-800/446-9488, ext. 3296 or 3290.



Calendar (continued from page 13)

May 8-11

COMMENCEMENT/SPRING REUNION WEEKEND, Golden. A special invitation to the classes of 1981, 1976, 1971, 1966, 1961, 1956, 1951, 1946, 1941, 1936 and 1931; many events scheduled including Senior Banquet May 9; Commencement and Reunion Class Dinners May 10; All Alumni Banquet May 11.

May 30

CSMAA SEVENTH ANNUAL GOLF TOURNAMENT, Applewood Golf Course, Golden. Reserve the date! Details to be announced.

October 12

PHOENIX ALUMNI - "OLD MAN'S OLYMPICS, PART II." At the home of Rhea and Dick Richards '62; details to be announced.

FOR RESERVATIONS AND ADDITIONAL INFORMATION, CALL 303/273-3290 OR 303/273-3295, OR, OUTSIDE COLORADO, CALL 1/800-446-9488, ext. 3290 or 3295.



UNDER THE "M"

INTENSIVE ENGLISH LANGUAGE TRAINING CENTER OPEN

An intensive English language training center opened recently at Colorado School of Mines under an agreement between CSM and INTERLINK Language Training Centers of Princeton, New Jersey.

The center offers language training and cultural orientation to both students and international professionals wanting this type of instruction. The curriculum covers listening, speaking, reading, writing and study skills in eight-week units consisting of 22 to 24 hours of instruction per week. In addition, the program also addresses the special linguistic demands found in science and engineering fields.

Classes are limited to an average of eight to ten students, and are taught by a professional staff using the latest approach to language training. Students enrolling in the program have classes on the CSM campus and typically live in the school's residence halls for the duration of the course.

The intensive English Language Center is housed in the CSM Department of Global Systems and Cultures. INTERLINK Vice President Ahad Shahbaz serves as center director.

Headquartered in Princeton, INTERLINK Language Centers is a private organization which has provided language instruction, academic preparation and cultural orientation to international students and businesses since 1980. The new CSM center is INTERLINK's third; others are located at Guilford College in Greensboro, North Carolina, and at Indiana State University in Terre Haute.

For tuition and registration information on the intensive English language training center at CSM, contact Ahad Shahbaz at (303) 273-3590.

♦ C S M A A ♦
**ANNUAL MEETING
& BREAKFAST**
in conjunction with
**CMA/SME ANNUAL MEETING
AND EXHIBIT**
Wednesday, February 27
7:30 A.M. ♦ \$11
Denver Hyatt Regency

MORE POSITIONS OPEN THAN APPLICANTS!!

Correct! For the past few months, the CSM Alumni Placement Service has been receiving more requests from companies with positions open than the service has applicants on file.

If you are a CSM alumnus and are interested in a job change, the CSM Alumni Placement Service is a good base to cover in your job search. The best time to look for a job is while you are still working. If you have any questions, please call

KAY ALEXANDER (303) 273-3294

Toll-free numbers: Inside Colorado: 1-800-245-1060 ext. 3294

Outside Colorado: 1-800-446-9488 ext. 3294

A sample of **POSITIONS OPEN** that are currently on file with the CSM Alumni Placement Service:

#56 ENVIRONMENTAL: Staff Engineer—Degree in geology, geological engineering or civil. Candidate should have completed courses in groundwater and soil mechanics. Field and office experience preferred. Graduate degree preferred, but not required.

#57 METALLURGY: Q.A. Engineer/Plant Metallurgist—Provide process engineering support to Q.C. department. Requirements include: computer literate, excellent written and oral communication skills and manufacturing environment experience.

#58 METALLURGY: Process Engineer—Prefer two years experience in extractive met. Responsibilities will include all aspects of smelter operation—process controls, production improvement, cost savings, etc.

#59 CIVIL: Project Engineer with five years experience. Strong structural background. Experience with crushed stone, concrete, sand and prestressed products.

#60 COMPUTER: Mining Software Support Specialist—Must have strong aptitude for computer oriented geological modeling and mine design applications. Experience using commercial mining software preferred.

Fall 1990 Enrollment Up 2.6 Percent

Undergraduate, graduate and non-degree student enrollment for the Fall 1990 semester at Colorado School of Mines is up 2.6 percent over Fall 1989.

Some 2,446 students are enrolled at CSM this fall, up from 2,385 last fall. Of this year's number, 1,698, or 69.4 percent, are Colorado residents, and 748 (30.6 percent) are non-residents. Foreign student enrollment is 369, or 15.1 percent of the total student body.

Minority students, including Native Americans, Blacks, Asian Americans and Hispanics, number 212 (8.7 percent). This represents a 12 percent rise over last year's minority enrollment,

with the largest increases seen in Native American students (27, up from 14 last year), and Hispanic students (95, up from 79).

This year's freshman class is comprised of 366 new students and 84 transfer students, for a total of 450. Women and ethnic minority students account for approximately 38 percent of the freshman student body.

The ratio of male to female students remains relatively constant, with men making up approximately 80 percent of the CSM student body, women about 20 percent.

ASARCO FOUNDATION GIVES \$300,000 GRANT TO COLORADO SCHOOL OF MINES

Asarco Foundation is providing a \$300,000 grant to Colorado School of Mines over three years to establish the Asarco Endowment for Departmental Excellence. The funds will be divided equally between the Departments of Mining Engineering, Metallurgical and Materials Engineering, and Environmental Sciences and Engineering Ecology.

Asarco Foundation has been established and funded by Asarco Incorporated to administer contributions to civic, health and welfare, educational and other worthwhile charitable and social service organizations. A leading producer of copper, silver, lead, zinc and gold, Asarco has operated in Colorado for more than 90 years.

In presenting the grant on behalf of the foundation, Robert M. Novotny, Asarco vice president, smelting and refining, said, "Colorado School of Mines has been in the forefront of colleges and universities training young people in the earth sciences. They are the people who will find, mine and refine the metals needed to maintain our standard of living in the United States. We are pleased that this contribution will be used to help the school sustain its high standards.

"Asarco traces its roots to Colorado," Mr. Novotny continued. "When Asarco Incorporated was formed in 1899 as the American Smelting and Refining Company, the Globe Plant in Denver was one of the original units to comprise the consolidation of lead-silver plants. Globe continues to produce high purity metals, cadmium and litharge.



Left to right: Jay Spickelmeier Met.E. 1969, Dr. George Ansell and Bob Novotny

"In Leadville, where Asarco today operates a zinc-lead-silver-gold mine, the historical connection can be traced even earlier. It was in Leadville that the Guggenheim family, whose name appears on and in buildings on this campus, first invested in the A.Y. and Minnie mines during the 1880s. Those two enterprises became the basis of one of the great American fortunes. Soon after Asarco was formed, and infusion of cash by the Guggenheims' helped to sustain the fledgling company which the family continued to manage during the early decades of the twentieth century."

Dr. George S. Ansell, president of Colorado School of Mines, said, "Colo-

rado School of Mines and Asarco face a common challenge in the 1990s: to provide the earth resources needed to improve the quality of life for more of the world's inhabitants. We now are called upon to generate and disseminate the knowledge and expertise required of responsible stewards of the earth and its resources. Asarco's generous gift of endowment for Departmental Excellence is an endorsement of our common determination to face and meet that challenge. On behalf of the Board of Trustees of Colorado School of Mines, it is my privilege and honor to recognize our partnership with Asarco in Colorado."

Mobil Foundation Gifts Total \$43,000

The Mobil Corporation Foundation recently presented Colorado School of Mines with grants totalling \$43,000 to support six programs at the school.

Mobil Foundation funding for 1990-91 includes gifts that will fund the following school programs and departmental efforts: \$3,000 to the Minority Engineering Program for high school minority students; \$9,000 in general support and \$8,000 for fellowships to the Geophysics Department; \$9,000 in general support, \$2,000 for a scholar-

ship fund, and \$6,000 for drill training courses in the Petroleum Engineering Department; \$3,000 in general support for the Geology Department; and \$3,000 in general support for the Chemical Engineering and Petroleum Refining Department.

"We are deeply grateful to the Mobil Foundation and Mobil Exploration and Production for their ongoing support of CSM programs," said Dr. George S. Ansell, president of Colorado School of Mines.

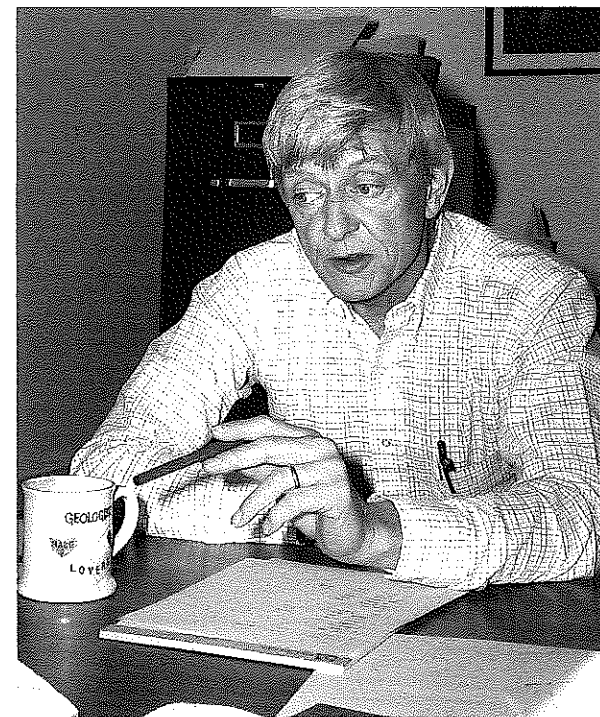
Since 1952, the Mobil Corporation has donated approximately \$1,651,099 to CSM. Major gifts include a \$231,000 drilling rig simulator given to the Petroleum Engineering Department in 1989; and a \$180,000 grant over three years to support the Artificial Intelligence Program.

Mobil currently employs 120 CSM graduates, and is an active recruiter of Mines graduates.



ADAMS NAMED DIRECTOR FOR CENTER FOR EXPLORATION GEOSCIENCE COMPUTING

Dr. Sam Adams



Dr. Samuel S. Adams, head of the Department of Geology and Geological Engineering at Colorado School of Mines, has also been named director of the school's Center for Exploration Geoscience Computing (CEGC). He succeeds Dr. Phillip R. Romig, head of the Geophysics Department at CSM, who had served as CEGC director since the center's inception in November 1989.

The center, initially a joint activity between CSM and IBM, was formed to facilitate the development of advanced computing capabilities relative to resource exploration and production, hydrogeology, engineering, and the environmental sciences. IBM provided the school with nearly \$2 million in computer equipment, associated software, and technical expertise to establish the center. Related center funding has come from a \$3 million W.M. Keck Foundation grant, and a \$500,000 Boettcher Foundation Challenge Grant.

"During the next year, we anticipate the addition of industry contributions to complement the center's ongoing programs of teaching and research," said Adams. "Donations of equipment and application software will further expand center facilities, and enable us to strengthen our emphasis on resource exploration and production, and environmental studies."

Currently, some 20 CEGC research projects involve faculty members from

the CSM programs of mining, petroleum engineering, geophysics, geology and geological engineering, and environmental sciences.

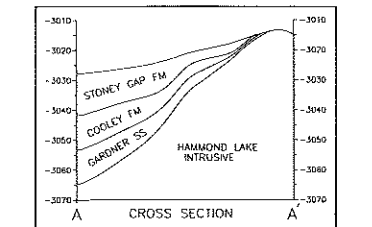
Adams joined CSM in 1986, and has since led the school's Department of Geology and Geological Engineering in the development of curriculum, facilities, faculty and research programs. His previous experience spans over 20 years in the mining and exploration industry, including vice president posts at both the Anaconda Company and Ertec Rocky Mountain, Incorporated. Adams also worked nine years as a consultant to mining companies and government agencies in the areas of mineral exploration and resource assessment.

The author of numerous articles and professional papers, Adams is serving his second term on the Board on Earth Sciences and Resources of the National Academy of Sciences. He is a member of the Geological Society of America's Strategic Planning Committee and past vice president of the Society of Economic Geologists.

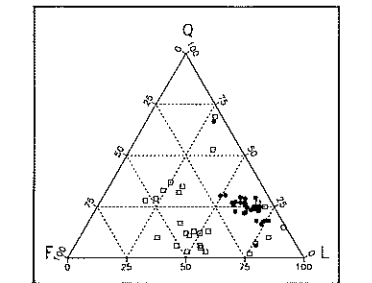
Denver Section HOLIDAY PARTY

TUESDAY, DECEMBER 4
DENVER ATHLETIC CLUB
11:15 social hour with lunch at noon
Speaker: Marv Kay, E.M. 1963,
CSM Head Football Coach
RSVP Alumni Office by Nov. 30
303/273-3295

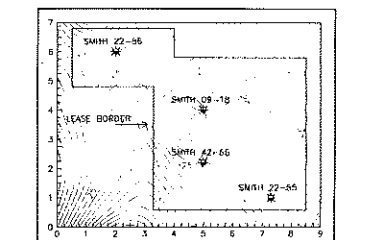
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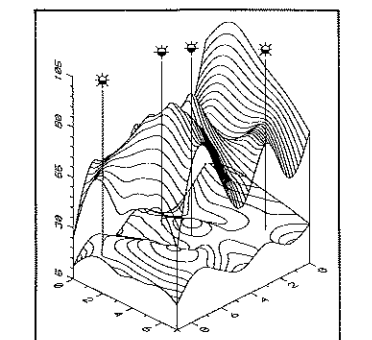
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NOMINATIONS NEEDED FOR ALUMNI ASSOCIATION AWARDS

The Colorado School of Mines Alumni Association is seeking nominations for those special individuals who have made significant contributions to either the association or the Colorado School of Mines.

"Undoubtedly, there are individuals who deserve the recognition of the Alumni Association. However, without help from friends or alumni familiar with the accomplishments of these outstanding people, the association has neither the knowledge nor the information needed to confer these honors. If you wish to nominate a qualified individual for one of these awards, please do so," says Award Committee chairman Ed Warren.

Nominations for all of these awards may be made by anyone whether or not they are a graduate of Mines. However, it is the responsibility and obligation of the person or persons making the nomination for any of the awards to cite the accomplishments and qualifications of the nominee.

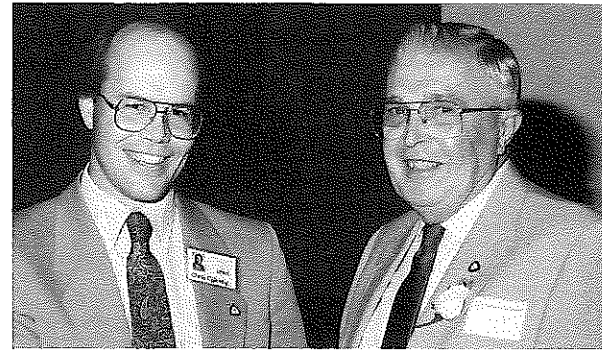
Nominations must be made in writing citing: (1) which award the nominee is being nominated for, and (2) the nominee's qualifications and accomplishments.

The 1991 Awards will be presented to the winning recipients during Commencement Week in May 1991.

Only those nominations received by the Awards Committee by January 15, 1991, will be considered. Mail your nominations to:
Awards Committee CSM Alumni Association
P.O. Box 1410, Golden, CO 80402

The CSMAA awards committee will meet in late January 1991 to review nominations for the following awards:

OUTSTANDING ALUMNUS AWARD: This award, which includes a life membership in the association, is given to a CSM alumnus and member of the association in recognition of one



Left, 1990 Young Alumnus Award winner Chris Oglesby '80, '88 and CSMAA President Jim Johnstone '48

who has contributed meritorious service on behalf of the Alumni Association. Nine such awards have been given previously.

HONORARY MEMBERSHIP AWARD: The first honorary membership in the Alumni Association was made in 1929 and only 156 of these awards have been made since. The award carries with it a life membership in the association. Criteria for honorary member are: the recipient must be of good moral character and in good standing professionally, and must have rendered distinguished service to the association and/or the Colorado School of Mines. The recipient does not necessarily need to be a graduate of CSM.

YOUNG ALUMNUS AWARD: The criteria for this award are based on service and potential to Mines and the Alumni Association. To qualify for the Young Alumnus Award, the nominee must be an alumnus of Mines who has received his or her degree no more than 15 years prior to the date of the award, and is not older than 40 years old at the time of the award. Five of these awards have been given to date.

New Faculty Members at CSM

Five new faculty members have joined the teaching staff at Colorado School of Mines this year in the geology, engineering, petroleum engineering and metallurgy departments.

Associate Professor of Engineering Nigel T. Middleton comes to CSM after serving as an associate professor of electrical and computer engineering at West Virginia University for the past five years. Middleton earned his doctorate from the University of Witwatersrand, Johannesburg, South Africa, and received his bachelor of science degree in electrical engineering from that university.

Stephen A. Marinello joins the faculty as an assistant professor in petroleum engineering. He had previously served as an assistant professor of petroleum engineering in the Department of Mineral Engineering at the

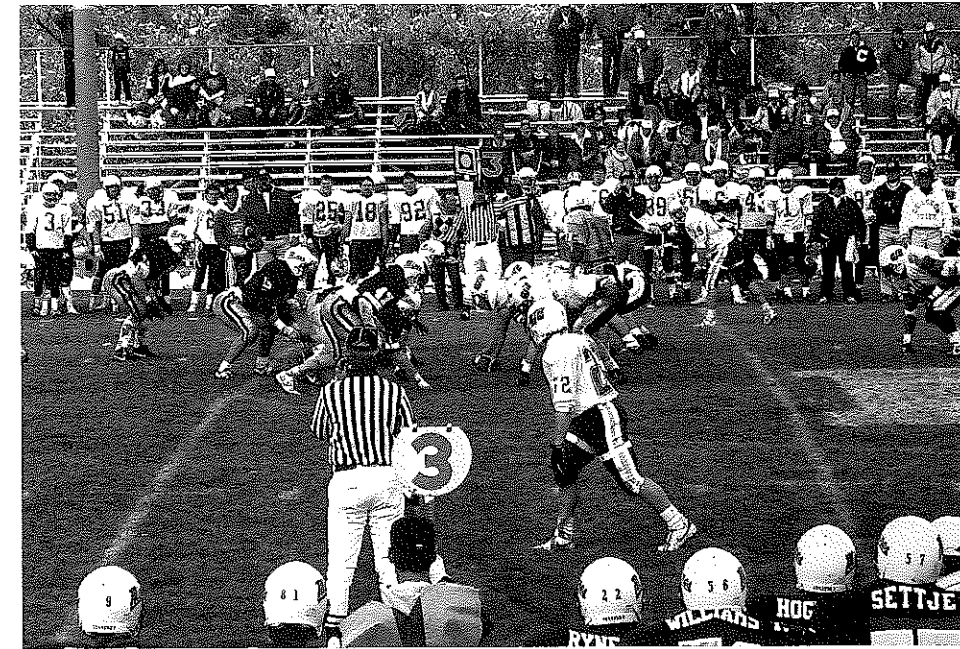
University of Alabama, Tuscaloosa, since 1984. Marinello earned his doctorate and masters degrees from the University of Southern California, and received his bachelor of science degree in biological sciences from Stanford University.

Michael J. Haun has joined CSM's metallurgy department as an assistant professor. He earned his doctorate in solid state science and his master of science degree in ceramic science from the Pennsylvania State University. He received his bachelor of science degree in ceramic engineering from Clemson University. Prior to coming to CSM, Haun worked as a research chemist at E.I. du Pont de Nemours and Company in Wilmington, Delaware.

Associate Professor John Blair Curtis comes to the geology depart-

ment after most recently working as a consulting geologist in the United States and South America. He had previously worked as a research engineer and as a petroleum geologist since 1976. He received his doctorate in geology from Ohio State University, and his masters and bachelor of science degrees in geology from Miami University.

Richard L. Christiansen is the new associate professor in the petroleum engineering department. Christiansen comes to the school after ten years as a senior engineer with the Marathon Oil Company. He earned his doctorate and masters degree from the University of Wisconsin, and earned his bachelor of science degree in chemical engineering (magna cum laude) from the University of Utah.



Mines coaches and players watch the action from the sidelines. Following the Homecoming game Mines was 4 and 3 for the season. (E. Glover photo)



Tug of war, human pyramids and other feats of strength spilled across Stratton Common as part of the homecoming fun. (Wetherell photo)



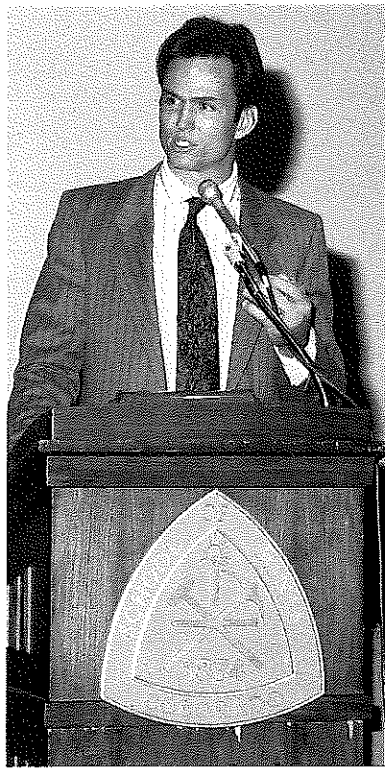
HOME COMING 1990

OCTOBER 19-20, 1990

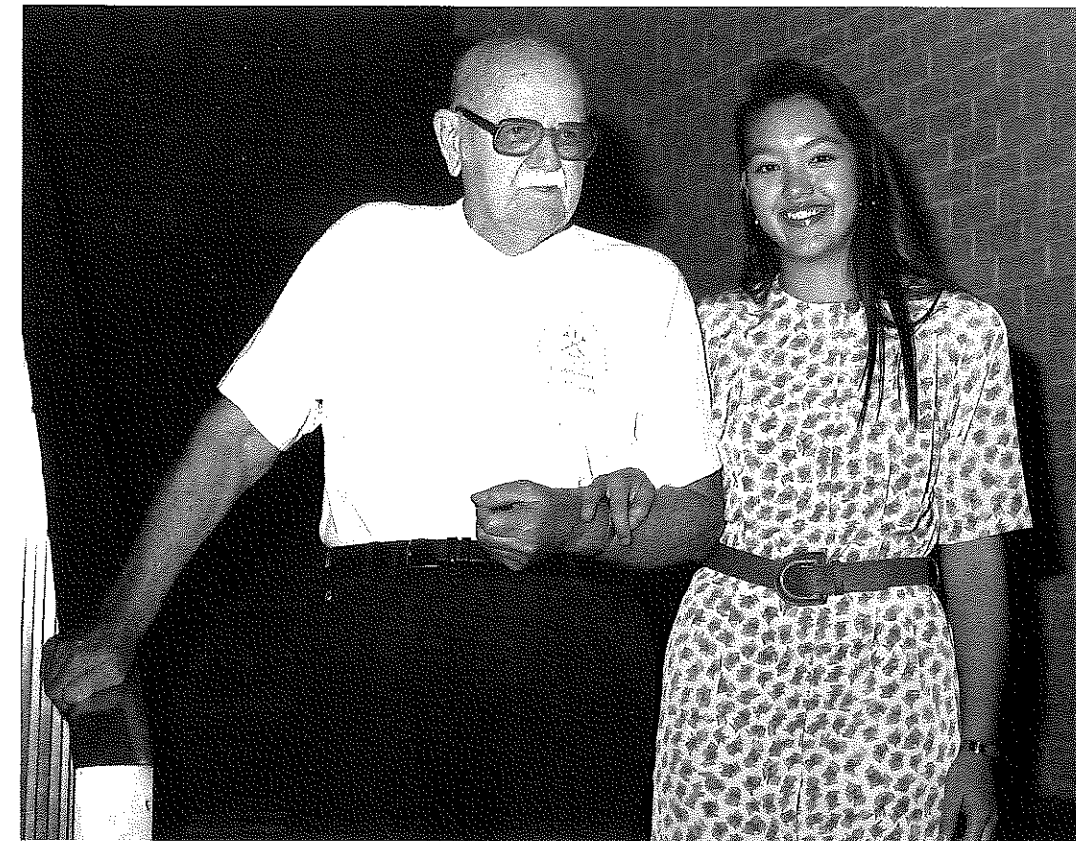
Several inches of snow early Saturday morning didn't deter the Orediggers as they went head to head against Chadron State who has had an undefeated season. The Nebraska team won 38-21. (E. Glover photo)



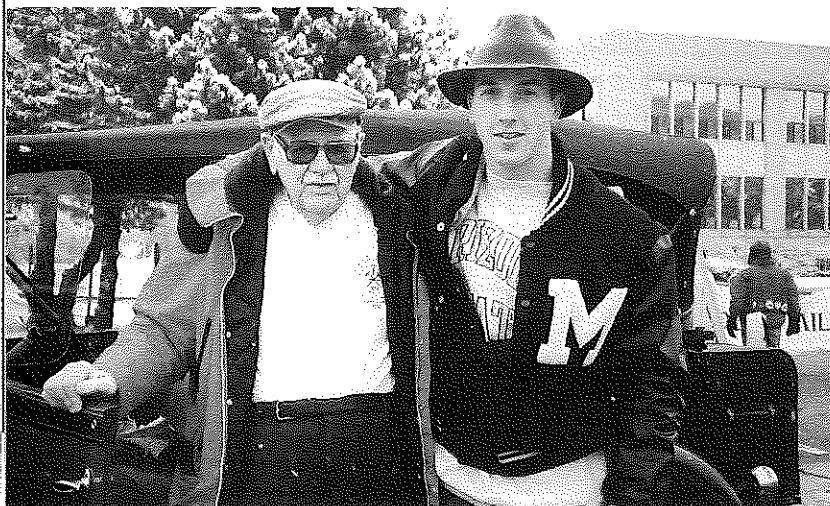
▲ This year's Homecoming theme was the "Wildlife Preserve," and the Kappa Sigma fraternity's float warned "Don't Intoxicate the Animals." (Wetherell photo)



▲ Steve Watson, former Denver Broncos wide receiver, was the featured speaker at the Quarterback Club luncheon which welcomed the Mines band and introduced the "queen and beast" candidates. Watson encouraged those present to follow the Mines football team's motto—"Commitment to Excellence"—by doing as much as they can as individuals. (E. Glover photo)

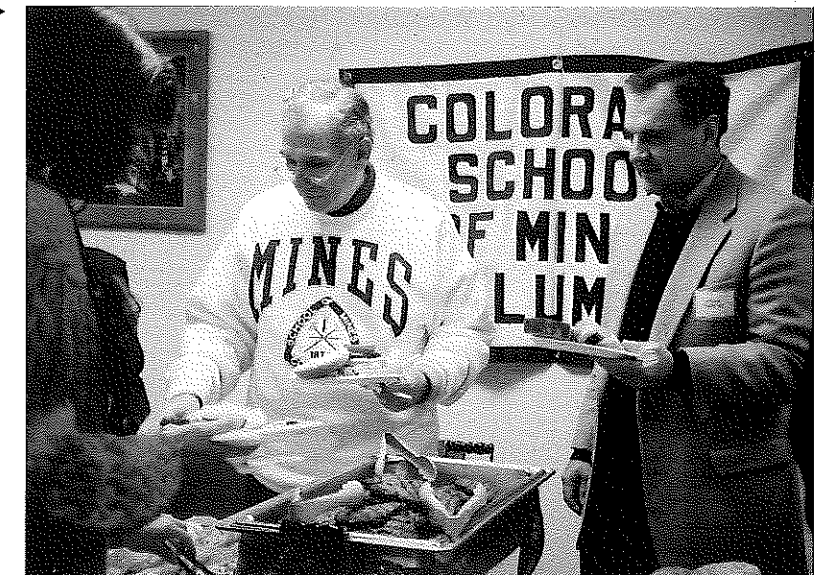


◀ Blue Key's entry in the "queen and beast contest": Paul Sharp, E.M. '33 and senior Mikki Hand. (E. Glover photo)



◀ Paul Sharp, E.M. '33, president of Blue Key in 1932 when the "M" was first lit, and current Blue Key president, Mike Todd, get ready for the Homecoming parade. Paul was invited back to campus by Blue Key for the Homecoming dedication of the newly renovated "M." (photo by M.J. Giddings)

CSM President George Ansell, Chuck Shultz, Geol. E. '61, and seventy-some other alumni and guests attended the pre-game tailgate picnic/barbecue which, due to the inclement weather, was moved indoors. A complimentary dessert buffet was provided by The Deans' Club. (M.J. Giddings photo)

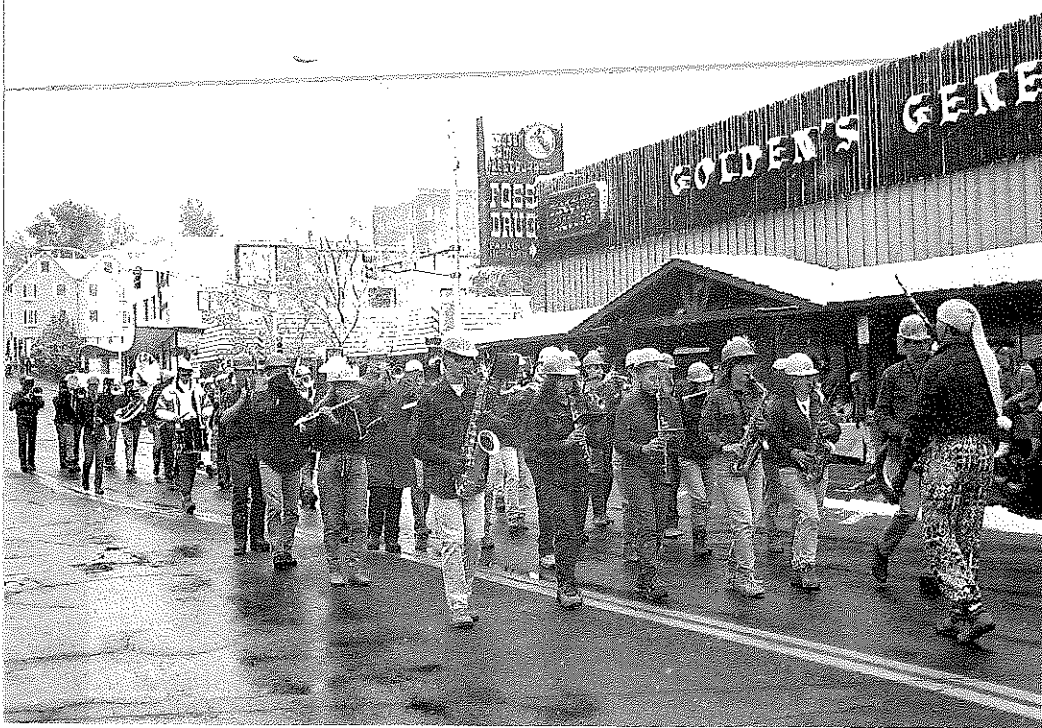


◀ Jack Wyatt, E.M. '50, joins the CSM marching band in "The Mining Engineer" at the tailgate picnic. (M.J. Giddings photo)

Three old friends meet at the Homecoming Quarterback Luncheon sponsored by CSM and the Golden Chamber of Commerce. Left to right: Ted Benson E.M. '33; Max Coats E.M. '35 and Paul Sharp E.M. '33. (M.J. Giddings photo) ▼



◀ Though the morning of Homecoming was cold, wet, and snowy, the CSM Marching Band, under the direction of Ross McClure, was loud and lively. (Photo by Wetherell)



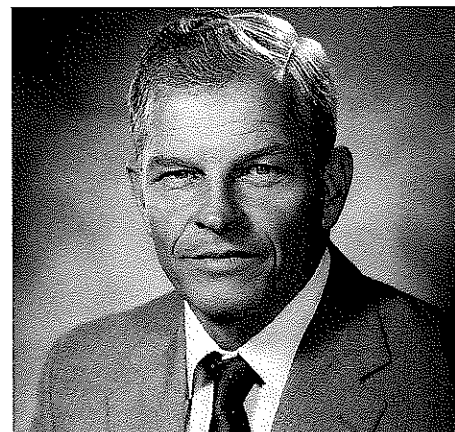
ALUMNI NIGHT
 DENVER NUGGETS
 VS. NEW YORK KNICKS
 THURSDAY, JANUARY 24
 7:30 P.M. • TICKETS \$12
 RSVP Alumni Office by January 17
 303/273-3295

50s



Jack Petty '52

'52 **Jack S. Petty, E.M.** has retired from his position as assistant manager/Rocky Mountain district, Mine Safety and Health Administration. Petty retired with 21 years of government service, following jobs with Asarco and Western Geophysics. He and his wife, **Patricia, Hon. Mem. '83**, will be traveling in Europe for several months.



Charles Baroch '54

'54 **Charles J. Baroch, Met. E.** has been appointed president of Hazen Research, Inc. in Golden, Colorado.

'57 **Allan D. Stoutenger, E.M.** has retired from Mine Safety and Health Administration. **Robert M. Jones, E.M.** has joined the John T. Boyd Company of Pittsburgh, Pennsylvania and has been assigned as resident coal advisor, USAID Private Power Sector, Islamabad, Pakistan.

'58 **Robert M. Hamilton, Geop. E. and Medalist '84** has moved to

Geneva, Switzerland for two years with the United Nations Relief Organization/Natural Disaster Reduction.

60s

'60 **Albert H. Wieder II, P.E.** has retired from Chevron and lives in Littleton, Colorado.

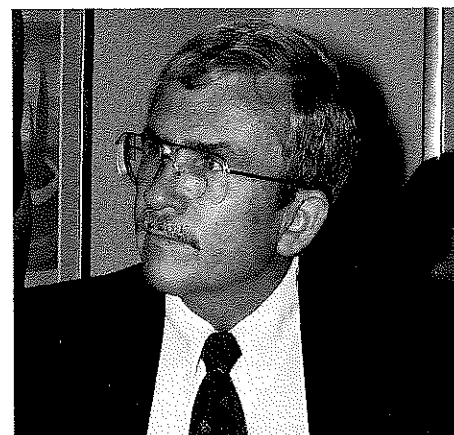
'61 **Douglas Halbe, Met. E.** is manager/metallurgy for Kalgoorlie Consol-Gold Mines in Kalgoorlie, Western Australia.

'64 **Lloyd J. Nordhausen, P.R.E.** is division manager for Marathon Petroleum in Texas City, Texas.

'65 **Gerald V. Jergensen, II, Chem. E.** is a metallurgical consultant for Denver Mineral Engineers, Inc. in Littleton, Colorado.

'66 **Kent T. Kerr, Met. E.** is major manager for Dow Chemical USA in Baton Rouge, Louisiana. **John S. Wagner, Jr., P.E.** is manager of operations for Oryx U.K. Energy Company in Uxbridge, Middlesex, England.

'67 **John E. Colt, Geop. E.** is principal engineer for James M. Montgomery, Consulting Engineers, Inc. in Bellevue, Washington. **Terence P. McNulty, DSc. Met. and Medalist 1989** has



Terence McNulty '67

been elected to the Allen Engineering Company Board of Directors.

'68 **Robert A. Reseigh, E.M.** is manager/underground construction for Guy F. Atkinson Construction Company.

70s

'70 **Charles D. Crew, BSc. Met.** is manager/Canadian region of Lift Truck

Division for Caterpillar in Toronto, Ontario.

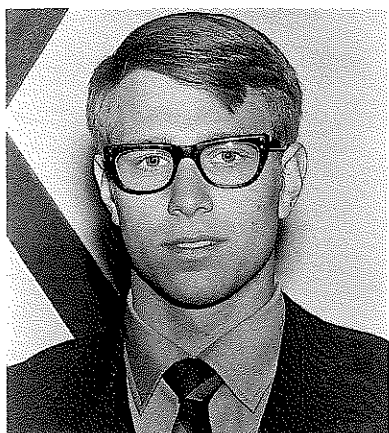
'72 **John M. Neubauer, BSc. Pet.** is a drilling manager for Marathon Petroleum Syria, Ltd. and is now on assignment in Damascus. **Oscar B. Nair, MSc. Math.** is a contract manager for Cyprus Coal Co. in Cincinnati, Ohio.

'77 **Robert Z. Smith, BSc. Min.** is vice president/sales for Peabody ABC Corporation. **J. Scott Gustafson, BSc. Geop. and MSc. Min. Econ.** '79 is a unit manager for Digital Equipment Corp. in Dallas, Texas. **Michael K. Decker, BSc. Geol.** is exploitation manager for Prima Oil & Gas in Denver, Colorado. **Andy Drenick, BSc. Pet.** will complete his MBA studies at Stanford in June 1991. **David A. Glater, BSc. Geol.** is manager of engineering for the Denver, Colorado office of Chen-Northern, Incorporated.

'78 **Mark L. Bricker, BSc. Min.** has been promoted by Bridger Coal Co. to their St. Louis, Missouri office as manager/corporate environmental and engineering services. **Gary W. Davis, BSc. CPR** is vice president/engineering environmental for Western Gas Resources, Inc. in Denver, Colorado. **Peter R. Pawlak, BSc. CPR** is a marketing analyst for Santa Cruz Operations in Santa Cruz, California.

'79 **William M. Zisch, BSc. Min.** is a mine manager for FMC Gold in Fallon, Nevada. **Lawrence T. Shade, BSc. CPR** is senior production engineer for Akzo Chemical, Inc. in Texas. **Bruce W. Techentien, BSc. B.E.** is an applications engineer for Otis Engineering Corp. in Texas. **Daniel R. Burns, MSc.**

Charles Crew '70



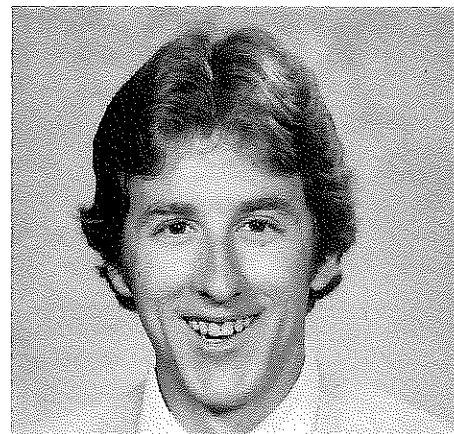
Geop. is senior vice president of New England Research in Duxbury, Massachusetts. **Dennis A. Pieters, BSc. Geol.** is a graduate student at the Colorado School of Mines. **John A. Falk, BSc. Geol.** is a transportation engineer for Clark County, Washington.

80s

'80 **Joseph W. Schieffelin, BSc. Geol.** is a geologist for the Colorado Department of Health in Denver. **Barbara F. Smith, BSc. Geol.** is an attorney for Guess & Rudd in Anchorage, Alaska. **Michael J. Cusick, BSc. Met., MSc. Met. '81 and PhD. Mat. Sc. '89** is senior research engineer for the Manville Corporation in Denver.

'81 **Raye L. (Musgrave) Fischl, BSc. Geop.** is a geotech for Transworld Energy International, Inc. in Denver. **Rebecca E. Parker, MSc. Geochem.** is a senior geologist for Conoco in Stavanger, Norway.

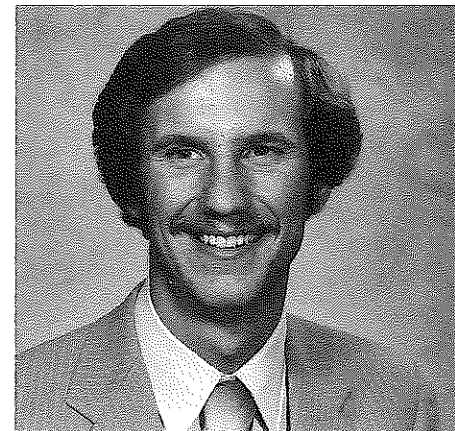
'82 **Michael S. Ness, MSc. Min.** is a rock mechanics geologist for Cyprus Metals Co. in Arizona. **Charles W. Peck, MSc. Geol.** is vice president of



Timothy Berg '82

American Oil & Gas Corporation. **Timothy Berg, BSc. Geop.** has been transferred to Amoco Exploration Company, London, England. **Brian M. McGinnis, BSc. Geol.** is an environmental engineer with FMC Corporation/Agricultural Chemical Group in Fresno, California. **Beverly (Castor) Marshall, BSc. Phy.** is a staff engineer for TRW in Denver, Colorado.

'83 **Sterling T. Strange, BSc. Min.** is project manager/aviation facilities for Birk, Hillman & Zipperly. **Roxanne L. (Pilcher) Latoria, BSc. Geop.** is a second lieutenant/civil engineer in the



Brian McGinnis '82

Illinois National Guard. **Rex A. Bigler, BSc. Pet.** is a gas supply manager for Unocal in Houston, Texas. **Richard D. Scofield, BSc. CPR** is a lieutenant in the U.S. Navy, stationed in Georgia.

'84 **Jeffrey L. Quintana, BSc. Pet.** is a drilling engineer for Arco in Bakersfield, California. **Kelly E. Cook, BSc. Pet.** received his MBA from the Uni-



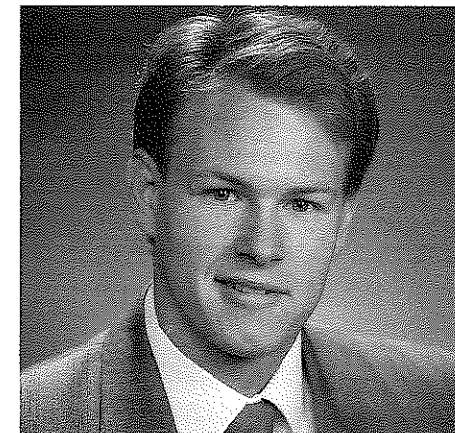
Kelly Cook '84

versity of California at Los Angeles and is now a senior business analyst for Tandem Computers in Cupertino, California. **Howard V. Scotland III, BSc. Min.** is a project engineer with Genstar. **Laurie A. Swanson, MSc. Pet.** is a project engineer for Agnoli, Barber & Brundage, Inc. in Ft. Myers, Florida.

'85 **Robert K. Kingery, Jr., BSc. Geop.** is a master's student in civil engineering at Colorado State University in Ft. Collins, Colorado. **Robert E. Bates, Jr., BSc. Math.** is an engineer for Woodward Governor in Fort Collins, Colorado. **Paul C. Reeves, BSc. Geop.** is a graduate student at City University of New York. **Sandra L. Perry, MSc. Geol.** is manager/image processing division of Barringer Labo-

ratories Inc., in Golden. **Stephen P. Smith, BSc. Pet.** is a graduate student at the University of Chicago (Illinois). **John P. Paolucci, BSc. Geop.** is working towards his MBA in international management at the University of Texas. **Barbara J. Slayman, BSc. Geop.** is a graduate student at the Colorado School of Mines. **Robert H. Okuno, BSc. Min.** is a manager for Cobra Imports in Utah. **John M. Ryding, MSc. Chem.** is a graduate student at the University of Washington. **Carol (Ondrussek) Edson, BSc. CPR** is an environmental engineer with USPCI in Denver. Carol was married to Jeff Edson on May 27 in Boulder, Colorado. **Robert B. Affleck, BSc. Math.** is a captain in the 20th engineer battalion and is in Saudi Arabia with Operation Desert Shield. **Joseph G. Ceurvorst, BSc. CPR and MSc. CPR '87** married **Shelley Wilson, BSc. Met. '88** on September 3, 1990 in Las Vegas, Nevada. They are living in Arvada, Colorado.

'86 **Jay S. Leaver, BSc. Geol.** and **Mitzi A. Nielsen, BSc. Geol. '87** were married September 15 in Pueblo, Colorado. Jay is with Western States Minerals Corp. in Denver, Colorado. **Douglas T. Harrison, BSc. Pet.** is a production engineer for Conoco in New Orleans, Louisiana. **Karl M. Smith, BSc. Eng.** is a nuclear plant operator for the U.S. Navy. **Warren T. Maierhofer, BSc. CPR** is a chemical



Warren Maierhofer '86

engineer for Groundwater Technology, Inc. in Englewood, Colorado. **Bradley M. Melnick, BSc. Phy.** is a graduate student at the University of Colorado.

'87 **Jeffrey B. Salen, BSc. Pet.** is a drilling engineer for Mitchell Energy in Ft. Worth, Texas. **Darren R. Warren,**

BSc. CPR is a project engineer for Consulting Services Group, Inc. in San Diego, California. **Mitzi A. Nielsen, BSc. Geol.** is with Energy Data Services in Denver, Colorado. **Mitzi and Jay S. Leaver, BSc. Geol. '86** were married September 15 in Pueblo, Colorado. **Peter C. Sanford, MSc. Met.** is task manager for UE&C/Stearns-Roger division in Denver, Colorado. **David A.K.C. Chang, MSc. Met.** is a metallurgical engineer with Precision Castparts Corp. in Portland, Oregon. **Scott B. Daves, BSc. Pet.** is a reservoir engineer with Meridian Oil Inc. in Farmington, New Mexico. **David C. Black, BSc. Pet.** is a quality control manager for Circuits, Inc. in Berlin, Connecticut. **Patricia M. Howe, BSc. Met.** is production manager for Frito Lay in California. **Michael A. Rome, MSc. Math.** is a graduate student at Arizona State University in Tempe. **Jordy L. Murray, BSc. Eng.** is a project engineer for Roebbelen Engineering in Bakersfield, California. **David C. Black, BSc. Pet.** is quality control manager for Circuits, Inc. in Berlin, Connecticut. **Catherine M. Mader, BSc. Phy. and MSc. Phy. '89** is a graduate student at Michigan State University in Lansing, Michigan. **'88 David W. Sobernheim, BSc. Pet.** is a field engineer II for Dowell-Schlumberger in Denver. **Jeffrey P. Quaratino, BSc. Eng.** is engineer I/structural engineer for M.W. Kellogg in Houston, Texas. **William T. Thoma-son, BSc. Geop.** is a geophysicist with Arco Alaska in Anchorage, Alaska. **Shelley Wilson, BSc. Met. and Joseph G. Ceuvorst, BSc. CPR '85 and MSc. CPR '87** were married September 3, 1990 in Las Vegas, Nevada. They are living in Arvada, Colorado. **Jon L. Bennett, MSc. Geochem.** is an environmental scientist for the Washington State Department of Ecology in Olympia. **'89 William R. Arnold, P.E.** is a petroleum engineer for Santos Ltd., an Australian oil & gas company, in Adelaide. **James B. Nelson, BSc. Geol.** is a graduate student at the University of Arizona in Tucson. **Carlos E. Rolandelli, BSc. CPR** is a process engineer for Merichem Co. in Houston, Texas. **David A. Pritchard, BSc. Eng.** is a gas engineer for Tenneco Gas Co. in Houston, Texas. **Brian L. Sumner, PhD. Math.** is a senior research technician



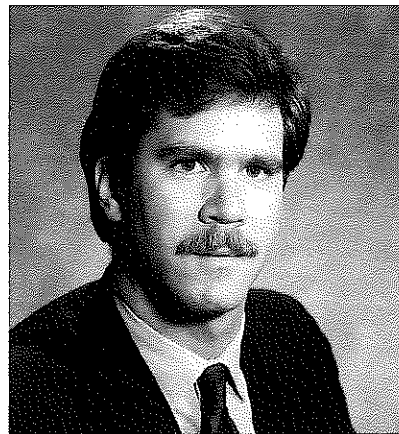
Lisa Lofdahl '89

for Texaco in Houston, Texas. **Konn E. Wilson, BSc. Eng.** is a project engineer for Koch Industries in Wichita, Kansas. **James T. Murray, BSc. Phy.** is a graduate student at the University of Oklahoma. **Lisa A. Lofdahl, BSc. Eng.** is an environmental engineer with Tenneco Gas in Houston, Texas.

90s

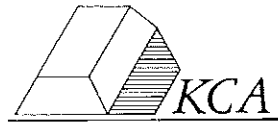
'90 Christopher W. Herne, BSc. Min. is a mining engineer with Consolidation Coal Co. in Denton, Illinois. **Alicia (Thornton) Whitehall, BSc. Chem.** is a technical specialist for Quantalex in Denver. **David A. Hart, BSc. Pet.** is a junior engineer with Arco Alaska, Inc. in Anchorage, Alaska. **John L. Hukill, BSc. Eng.** is a systems engineer for Martin Marietta in Denver.

Kristen L. Gould, BSc. CPR is an engineer with United Engineers & Constructors/Stearns-Roger division in Denver. **James A. Kovats, BSc. Geop.** is a student appointee with United States Geological Survey. **Joy M. Hansen, BSc. CPR** is with Amoco Oil Research & Development in Naperville, Illinois. **Gregory A. Szutiak, BSc. Pet.** is a staff engineer for Kelco (a division of Merck) in San Diego, California. **Timothy P. Gribben, BSc. Met.** is a chemical engineer with U.S. Bureau of Mines/Reno Research Center in Nevada.



Tom Nickoloff '83

Correction: **Tom Nickoloff, BSc. Geop. '83** was incorrectly identified in the October 1990 Updates.



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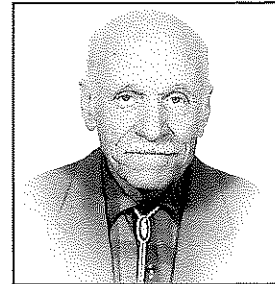
Mines Magazine would like to express the condolences of the Colorado School of Mines Alumni Association staff and directors to the families and friends of the following alumni. Unfortunately, we do not have much information on the following individuals. If you have more information please write to the editor.

David A. Garcia, BSc. Met. and Met. E. '83 died January 1, 1990.

John V. Finnegan, E.M. '42 and P.E. '51, of Littleton, Colorado, died August 28, 1990. He was retired from U.S. Bureau of Land Management, and he spent most of his career with the U.S. Geological Survey.

Arthur V. Kane, P.E. '55, of Littleton, Colorado, died July 23, 1990.

Norman Whitmore



Norman Whitmore, E.M. '26 died March 31, 1990, in Tampa, Florida. Born December 3, 1899, in Eastonville, Colorado, he was

90 years old.

From 1931 until he retired and moved to Florida in 1986 he operated the Minerals Engineering Company in Los Angeles, California, consulting on mines located in the United States, Mexico, Turkey, Africa and South America. During the early years of his career he also conducted prospecting classes and spoke to numerous organizations on mining and the Tommyknocker legends.

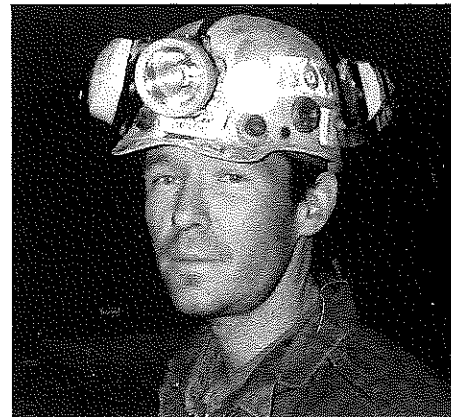
He and his wife, Doleta, now deceased, celebrated their golden wedding anniversary in 1977.

He is survived by two daughters, Bette N. Pettengill of North Carolina and Darrelyn A. Underwood of California, and three grandchildren.

Bruce E. Carlson

Bruce E. Carlson, manager of the Edgar Mine in Idaho Springs, Colorado, was killed in an equipment accident at the mine early in the evening of Wednesday, October 3, 1990.

Carlson, 34, had served in various positions at the Edgar Mine since 1983, and was named mine manager in 1986. He earned a B.S. degree in mining from



Bruce Carlson

CSM in 1985, served as an instructor in mining over the 1985-86 academic year, and was currently enrolled in a master's degree program at Mines. In addition to overseeing mine operations and tours at the school's experimental mine, he was coordinator of mining events held during E-Days.

A member of AIME, Carlson was a certified mine safety instructor, held an Engineer in Training certificate, and served as a consultant to several mining operations in Idaho and Texas. In addition to coaching CSM's competitive mining team, Bruce traveled throughout the United States to assist in mine competitions and actual mine rescue efforts. Prior to joining CSM, he worked as a miner and mine mechanic in industry. He was a 1974 graduate of Glenwood Springs High School (Colorado), and a native of Morristown, New Jersey.

Carlson is survived by his wife, Juliet, a CSM master's degree candidate and a resident of Idaho Springs; a son, Christopher, of San Diego, California; parents, Kenneth and Ethelee of Glenwood Springs; sisters, Martha of Glenwood Springs, Donna Thompson of Omaha, Nebraska and Holly Heaton of Englewood, Colorado; and a maternal grandmother, Edith Malone of Chicago, Illinois. He was preceded in death by a brother, Jeffrey.

The Bruce Carlson Memorial Fund has been established at CSM at the request of the Carlson family. The scholarship fund will support deserving students in the Mining Department. Checks made payable to the Bruce Carlson Memorial Fund may be sent in care of Ken Dike, CSM Foundation, Inc., Colorado School of Mines, Twin Towers, 1118 Elm St., Golden, Colorado 80401.

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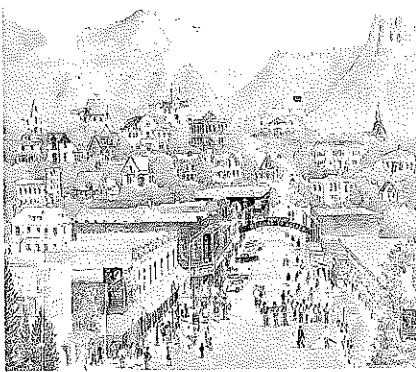
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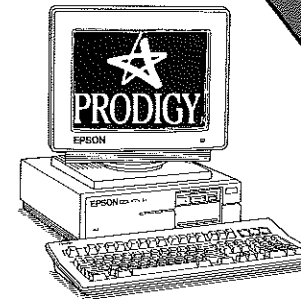
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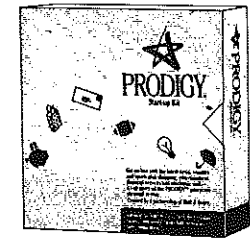
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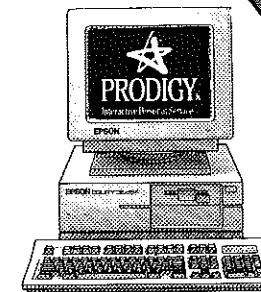
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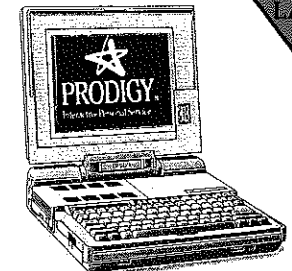
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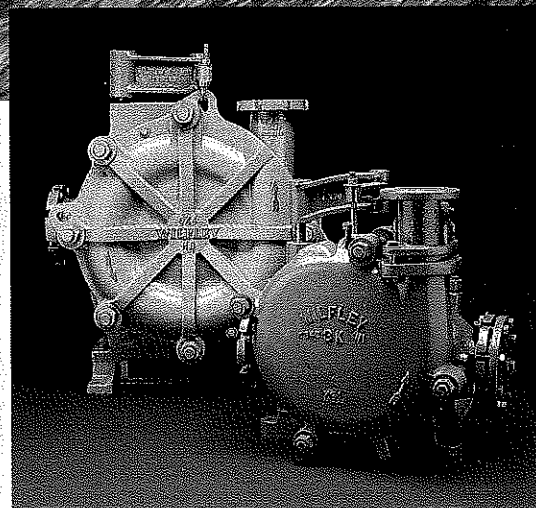


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