Dravo brings a breath of fresh air to nonferrous smelting.

Dravo is a pioneer in the application of oxygen technology in nonferrous pyrometallurgical processes. We use three methods, all of which increase productivity, conserve energy, and protect the environment. The "TBRC" process. The "Oxygen Sprinkle Smelting Process. And the "Oxygen Technology in nonferrous smelting processes by writing bringing a breath of fresh air to nonferrous smelting processes.

All three are efficient metallurgically and economically for processing varying grades of concentrates. And all three bring a breath of fresh air to nonferrous smelting.

Find out more about our pyrometallurgical processes by writing Dravo Corporation, 1250 14th Street, Denver, CO 80202. Attn: Manager, Nonferrous Pyrometallurgical Processes.

*Licensed process

Dravo Engineers

and Constructors
alumni events calendar

Nov. 4-6—Cont. Ed. “Maintainance Management for the Mining Industry.” (CSM) For further information contact K. M. Barbour, CSMAA, 1515 Cleveland Place, #330, Denver, CO 80202, (303) 534-1181.

Nov. 11-12—CAN Convocation, Houston, TX, Lunch: Hilton Post Oak, 11:30 a.m.

Nov. 15—USA Convocation, Atlantic City, NJ, Lunch: Plaza Hotel, 11:30 a.m.

Dec. 3—CSMAA Meeting, Spokane, WA, Breakfast, 6:30 a.m.

Dec. 6—CSMAA Alumni Meeting, Tucson, AZ, Luncheon to be announced.


Dec. 10-12—CONVOCATION Convocation-Den- sity—Nov. 19, 20, 21, Great Lakes, 9 a.m.-Com- mences at 9 a.m.

Feb. 15-17, 1981—National Western Mining Congress (NWC), Denver, CO, sponsored by the Colorado Mining Alumni, 1515 Cleveland Place, #330 Denver, CO 80202, (303) 534-1181.

Feb. 17-18—CSMAA Convocation, Denver, CO, Lunch: Denver Athletic Club, 11:30 a.m.

Feb. 14-18—PASQER'S DAY BANQUET, Denver to be announced.

Feb. 21-22—CSMAA National, Chicago, IL, Breakfast, 7:30 a.m.

Mar. 3—MINES Magazine, 20th Anniversary, Golden, CO 80401


comment... Annual Membership Drive

William E. Leckie

Scholarships 35

Cover design depicting mineral economics by Barbara J. Noffsinger.

departments

Cover... Annual Membership Drive

Col. William E. Leckie, '49

volume 70

number 9

november, 1980

features

Ten Years of Mineral Economics at Mines 5

The Adverse Effects of Federal Regulations 11

J. Peter Grace

Athletics and Academics 20

Kathleen B. Johnson

ASAP: Program for Success 23

Marshall C. Crouch III, President, CSMAA

with the November issue of the Mines Magazine, your Alumni Association begins the annual membership drive for the 1981 fiscal year. Also with this issue I introduce myself, William E. (Bill) Leckie, as your new Executive Director. George Mitchell resigned in August to accept a position with Fugo-Rocky Mountain in the Denver area. I have several charges from the Association Board of Directors, and expect to receive additional charges from my new Board to be elected later this year.

Currently I have three primary areas to cover:

1. Visit all local sections; determine their needs and assistance that the Association can provide; then provide what they request.

2. Student needs:
   a. Explain the current, and continuing, student financial assistance needs.
   b. Seek local alumni section aid in providing one-on-one contact with all alumni in the solution to this problem.

3. While not busy with 1 & 2 above, run the Alumni Association in an efficient manner.

Your Association is composed of five divisions:

1. Alumni Affairs—Simply stated, this office carries out the wishes of your Board of Directors in all matters concerning the Mines Student Member of the Alumni Association, and the minerals industry which we hope is interesting and informative to you.

2. Placement Service—Your Alumni Association is more informed and aware of the student concern and needs than any routine job placement agency; we are also more aware of the expertise of our CSM graduates. In turn, the minerals industry is aware of our service and of our interest in filling their need with a competent CSM graduate. Our policy is not to "head-hunt" for anyone, but to serve as a source of expertise for industries with those CSM graduates who have filed written (confidential) resumes with our service.

3. Records—With over 9,000 living graduates, and 7,000 known addresses of those graduates, we have an Association of over 4,000 active members. Each member receives our monthly MINES Magazine and a copy of our yearly Mines Directory, listing name, address and affiliation of all known graduates. In addition, the graduates are further subdivided by graduating class, alphabetically, and geographically. If your address is wrong or unlisted in this directory it is probably your fault; you didn't advise us of a change.

4. Placement Service—Your Alumni Association can provide each Mines student with a source of expertise from the Association Board of Directors, and from the Denver area, I have several charges of the Mining Department to improve the proposed curricular changes of the student concern and needs.

5. Alumni Office—The Alumni Office is responsible for the student-faculty-administrative functions, student loans, planning and Basic Engineering Departments into the new George R. Brown Hall. We have focused on the Alumni Office—Mr. Noffsinger is a craftsman and artist who has numerous projects to her credit, including the recent "METALS" publication of the Colorado AIPG. She now adds this cover of MINES Magazine to the October issue, and did not receive a credit line. Gibson also took the Cover design depicting mineral economics by Barbara J. Noffsinger.

Cover... Annual Membership Drive

Col. William E. Leckie, '49

Alumni affairs—First and foremost, the Alumni Association furnishes news for the School, the Alumni, and the minerals industry which I hope is interesting and informative to you.

3. We goofed.

So far, the probability is with number 1 or 2 above.

In September I had the privilege of attending the annual meeting of the American Mining Congress in San Francisco. Many excellent papers within your area of interest were presented—and 97 Mines Alumni attended our luncheon on Tuesday, September 23. Mines Student Member of the Board of Trustees, Miss June Leaver, spoke to the group on student life, briefly reviewed the student-faculty-administration discussion of the Keystons Conference reported to you in our September issue of the magazine, and told of the student concern and needs resulting from increased costs of partaking in an excellent mineral engineering education.

3. We goofed.

Robert T. Reeder of the Mining Department, Secretary and Director of the Alumni Association Board of Directors, and Director of the Mining Health, Safety and Research Institute followed with a summary of current school events. He covered the current school enrollment of 2,900 students, the Mining Department enrollment of 330, the imminent move of both the Mining and Basic Engineering Departments into the new George R. Brown Hall, and an appeal for industrial/alumni input and expertise into the proposed curricular changes of the Mining Department publications as an addendum to this issue of the MINES Magazine. Please give the mining department this help!

The Opening Session of the 1980 AMG Mining Congress in San Francisco was without doubt the most outstanding such event that I have ever attended. Three outstanding speakers; two from government and one from industry presented the existing condition of an over-regulated minerals industry and directly connected the consequences to the economy and defense posture of our country!

I have copies of these presentations and intend to reproduce, or at least summarize them, in this and later issues of the MINES Magazine. These presentations are:

The Adverse Effects of Federal
Ten Years of Mineral Economics at Mines

In the fall of 1969, the Board of Trustees of the Colorado School of Mines established a separate department granting Department of Mineral Economics. In ten short years the Department has grown to be the largest such graduate program in the world with over one hundred and forty students pursuing masters and doctoral programs. During the history of the Colorado School of Mines it has become common-place to expect CSM graduates to be the best mineral engineers in the world. Why then did the Board of Trustees see fit to add this, a special program in Mineral Economics? It is essential that the mining industry in the world be aware of the increase in the world's population and the problems of mining and energy industries, and was reported in the local and national press and is also worthy of your close attention.

I look forward to working with the Alumni Association, hope to visit with you at your local meetings, and most of all, to provide you with sections with any desired support from the School.

William E. Leckie

---

John R. (Jack) McMinn, '42
Operations and Management Consultant
406-259-9304
2307 S. Street West
Billings, Mont. 59102

DENVER WEST TRAVEL SERVICE
Your Complete Service Travel Agents

Airline tickets Hotels
Tours Cruises
Car Rentals Packages

Tickets Delivered
No charge for our professional travel services

CALL ON US TODAY
1728 Cole Boulevard Denver West Office Park 277-1212
Golden, Colorado
Bill Long '69 John Roid '70

HARRISON WESTERN CORPORATION
CONTRACTORS-ENGINEERS
1208 Quail St., Denver, Co 80210 (303) 234-0273

FOR THE UNITED STATES
BUREAU OF RECLAMATION
HARRISON WESTERN
IS CONSTRUCTING
A SYPHON PIPELINE AT THE GRANITE CREEK
PROJECT, NEAR BASALT, COLORADO

PROJECT DETAILS

- Pipe line
  4000 ft. Long
  30" Diameter
- Pipe trench excavated on slopes greater than 100% grade.
- Pipe laid on slopes greater than 100% grade.
- Limited right-of-way—15 ft.
- Job located at 10,000 ft. elevation.
- Diversion structure of concrete placed by helicopter.
- Construction cable way—single span of 3200 feet; with a height at midpoint above the canyon floor of 300 feet.

In the fall of 1969, the Board of Trustees of the Colorado School of Mines established a separate department granting Department of Mineral Economics. Ten short years the Department has grown to be the largest such graduate program in the world with over one hundred and forty students pursuing masters and doctoral programs. During the history of the Colorado School of Mines it has become common-place to expect CSM graduates to be the best mineral engineers in the world. Why then did the Board of Trustees see fit to add this, a special program in Mineral Economics? It is essential that the mining industry in the world be made aware of the increase in the world's population and the problems of mining and energy industries, and was reported in the local and national press and is also worthy of your close attention.

I look forward to working with the Alumni Association, hope to visit with you at your local meetings, and most of all, to provide you with sections with any desired support from the School.

William E. Leckie

---

John R. (Jack) McMinn, '42
Operations and Management Consultant
406-259-9304
2307 S. Street West
Billings, Mont. 59102

DENVER WEST TRAVEL SERVICE
Your Complete Service Travel Agents

Airline tickets Hotels
Tours Cruises
Car Rentals Packages

Tickets Delivered
No charge for our professional travel services

CALL ON US TODAY
1728 Cole Boulevard
Denver West Office Park 277-1212
Golden, Colorado
Bill Long '69 John Roid '70

HARRISON WESTERN CORPORATION
CONTRACTORS-ENGINEERS
1208 Quail St., Denver, Co 80210 (303) 234-0273

FOR THE UNITED STATES
BUREAU OF RECLAMATION
HARRISON WESTERN
IS CONSTRUCTING
A SYPHON PIPELINE AT THE GRANITE CREEK
PROJECT, NEAR BASALT, COLORADO

PROJECT DETAILS

- Pipe line
  4000 ft. Long
  30" Diameter
- Pipe trench excavated on slopes greater than 100% grade.
- Pipe laid on slopes greater than 100% grade.
- Limited right-of-way—15 ft.
- Job located at 10,000 ft. elevation.
- Diversion structure of concrete placed by helicopter.
- Construction cable way—single span of 3200 feet; with a height at midpoint above the canyon floor of 300 feet.
Valveless Rock Drills. Large reversible piston hammer for power and direct air flow provides faster penetration. Integral muffler for quieter operation. Full hole size drilling range.

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air.

To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

The hole shootin' match from Gardner-Denver-Gardner-Denver. Get the drop on any rock job with one of these top-notch rock drills from Gardner-Denver. They're Gardner-Denver reliable for shift after shift performance. Gardner-Denver last for more for you, more for the dollar, and easier to operate.

Gardner-Denver

Independent Power Rotation Drills. These tunnel and surface long hole or single pass drills include separate control of impact and rotation.

Riffle Bar Drifter Drills. These multi-faceted made a name for itself with just a little air. To match a Gardner-Denver percussion drill to your rock, contact your Gardner-Denver Representative. Or write us at P.O. Box 300, Denver, Colorado 80201, Gardner-Denver — The measure of performance.

GARDNER-DENVER
the Department of Mineral Economics has taken a leading role in research market development for alcohol fuels and solar industrial process heat. During the past two years, this part of the Department's sponsored research program has provided thesis topics for graduate students. Funding for the various projects in this area has been provided by the Colorado Department of Agriculture and the Solar Energy Research Institute.

A most active program in the area of public policy and natural resources is the Energy Research Institute. This institute is cultivating a unique and distinct focus, more completely described elsewhere in this article. The Energy Research Institute serves to more adequately inform public policy makers about the unique issues that surround energy resource development. The Institute is in its fourth year and is typically funded by agencies such as the Department of Energy, Bureau of Mines, Office of Surface Mining, United States Geological Survey and the Colorado Energy Research Institute. Additionally, private funds have been provided by ARCO Coal Company, the Public Service Company of Colorado, the Hewlett Foundation, Rocky Mountain Energy Company, W. R. Grace and Company, and The Phillip Foundation. One graduate student intern per year is sponsored by the Energy Research Institute and several other students are employed on an as needed basis.

The Department of Mineral Economics provides the leadership for the Policy and Research Program of the Mining and Minerals Resources Research Institute (MMRRI: P.R.I., 85-87) at the Colorado School of Mines. During the past two years, this program has sponsored five fellows, two of whom have finished their degrees. The MMRRI Policy Program and Resources has also served in an interdisciplinary mode to provide expertise for other research programs at the Colorado School of Mines, Colorado State University, and the University of Colorado, specifically for the Colorado General Assembly. This major driving force behind research in regional resource developments has been the need for inter-industry (input-output on i-o) models for firm, agency, and public purposes. The development of these models is basically a cooperative effort between the Colorado School of Mines and Colorado State University. For the last four years the joint OSM-CSU-OMI research project has averaged an average of five major datasets per year. The focus subject models in these models range from coal to labor to natural gas to water. The subject models regions have ranged from northwest Colorado to the Powder River Basin, Wyoming, to the City of Greatey, Colorado, to the Ogallala High Plains of Colorado. Depending on the projects, as many as five graduate students may be employed by these activities at any given point in time. The typical funding agencies for this portion of the Department of Mineral Economics research program are the Bureau of Land Management, the Department of Energy, the Forest Service, and the Colorado State Department of Agriculture.

The members of the Department of Mineral Economics academic faculty who have been involved in contract research for the past year include Drs. Ruth Maurer, Oded Rudavsky, and Joseph C. Weber. The research faculty members are Drs. Ray C. Ericson and Janice C. Hepworth, and Mr. James Kennedy.

**Where Are We Going and How Will We Get There?**

It has been the primary goal of the Department to assemble the finest mineral and energy economics and management faculty it is possible to obtain. Our next goal is to challenge this faculty by attracting the most intelligent, probing, potential entrepreneurs we can find. We would then hope that the graduates of the program would rapidly become the cadre from which our country's next group of mineral and energy managers are selected. Contrary to a trend observed in many large public universities, we are more concerned with turning out leaders for the private, rather than federal, public sector. Our logic for this approach is simple: by educating primarily for the private sector, we maximize the chances that our graduates will do well enough to be able, and willing, to return and support the school which produced them.

We believe that the above goals, a faculty and student body second to none, can be accomplished in the following manner:

*Every professorship and fellowship in the Department should be named for and funded by a private corporation.*

We feel that this should be done to emphasize the value of higher education and that the economic philosophy of the Department could be summed up in the following statement:

"Free enterprise and competition are not philosophies to be debated, but gospel to be spread."

---

**Guion & Pearson, Inc.**

**Exploration Contractors**

Geology / Geophysics / Management

203 N. ANNAPOLIS ST. DENVER, CO 80204

(303) 952-0777

Douglas A. Boves '74

William S. Pearson '74
SURVIVAL OF THE FITTEST

Although best in a figure "S" as a result of a truck rollover, this MESABI Core Radiator has been diced. As the only expendable component salvaged from the truck, the core has been filled with an electric water pump and made a regular circuit of trade shows to demonstrate the reliability of the MESABI Core Radiator.

A 22-ton truck tested the MESABI Core Radiator with a rollover Score: MESABI Core — no leaks, Truck — scraped

This was an extraordinary test of the MESABI Core Radiator to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to withstand punishment without leaking.

The leaking radiator problem is overcome with rubber seals which hold individual cooling tubes in radiator headers. The seals absorb stresses soldered joints can't take. MESABI Cores are so tight that L & M Radiator warrants them against leaking for 18 months. Punctured cores can be repaired on site because cooling tubes are individually replaceable. Damaged tubes can be replaced without special tools or skills to bring the core back to 100 percent cooling efficiency. If new tubes aren't available, tube plugs can be plugged for replacement later.

No great cost to convert to MESABI Core Radiators. Over 300 core configurations interchange with any bolt-on type core and fit existing frameworks. Call or write today for core catalog and price list.

L&M RADIATOR, INC.
1414 East 37th Street, Hibbing, Minn. 55746 U.S.A.
(218) 263-8993 Telex: 29-4448
Manufacturing Splicines in the United States, Canada, Mexico, Australia and Republic of South Africa.

![Image of a truck with a MESABI Core Radiator]

The Adverse Effects of Federal Regulations

by Senator James A. McClure, (R) Idaho

In the 1960's we saw a country growing economically, growing industrially, and concerned about environmental quality. As I moved from the Idaho Legislature to the United States House of Representatives, in 1967, my vision of these growths changed. In the late 1960's Congress passed major environmental legislation—the Wild and Scenic Rivers Act, the Endangered Species Act, the National Environmental Policy Act and the Clean Air Act. In the 1970's, the growth in environmentalism dominated public policy— with little regard to economic and industrial losses.

Somewhere during the '70's we lost the vision of a protected environment. We confused it with an attitude called "no growth." Now, I fear, no growth has crippled economic and industrial development. These adverse effects are evident in the restrictive legislation continuously being passed, in the regulations, and in the adversary relationships which exist among our administrative agencies and industries.

Development of legislation is in attempt to reach a goal. While there may be a difference of opinion in the need to achieve certain goals, there are few who would not support protection of the environment.

The government feels that its responsibility is to protect the environment by preventing development. So, it expands laws and regulations. To mention a few: National Environmental Policy Act, Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Occupational Safety and Health Act, Mine Safety and Health Act, Wilderness Act, Fish and Wildlife Act, National Pollutant Discharge Elimination System, Federal Land Policy and Management Act, and Mine Reclamation Act. This is the domino theory in action. The legislation seems simple at first, then after a year, more or less, we see the impact.

Consider this: the preamble to the Constitution of the United States contains 52 words. It explains the purpose and functions of the United States government. Those 52 words say it all. Last year it took a government agency 11,540 words to explain one regulation on growing olives in California. James Madison wouldn't have understood. Neither would Alexander Hamilton. Nor do the olive growers.

In contradiction to President Carter's campaign promises to cut back on regulation, the Code of Federal Regulations that governs almost every phase of our lives now takes a shelf 15 feet long. We've grown two feet of shelf in the last three years. At this rate, the shelf will soon be out in the parking lot.

Laws, regulations, the adversary position between government and industry. What else? Agencies. Back in 1964, before the environmental movement and the no growth philosophy, we had four major areas of regulatory responsibility in the government: antitrust, SEC, transportation, and commerce.

Now, how many? The General Accounting Office cites 116 agencies, the Carter Administration, 90 agencies, the Center for Study of American Business, 55 zon enia, and the Senate Joint Committee on Government Operations, 41 agencies. No matter what the number, it is too much.

The Constitution protects us from a dictatorship by the President or the military, but even the genius of our forefathers don't foresee dictatorship by limitless and faceless regulations. We can't say impeach "him," because there is no "him" to impeach. The regulations, not the President, are the enemy. The regulations are what determines our freedom.

The regulations cost our country 103 billion dollars a year—$2,000 for each household. The American family can't afford $2,000 a year to pay for a cookie jar. Nor do they need or want $2,000 worth of additional regulation. But that's an issue which hasn't received much public attention.

Laws, regulations, adversary positions, cost and policy conflicts. To comply with the regulations of one agency, you often violate the regulations of another. If the back up warning horn on your truck is loud enough to satisfy one agency, it's so loud it violates the regulations of another. On a broader scale, it reminds me of a letter I got from one crusty old prospector in Idaho who summed it up best: "The government is so big it's falling all over itself."

1970 Policy Act

There is no doubt that an effective, coordinated policy, intended to encourage mining and mineral development, must be implemented. Implemented, not developed, because this brings to light the Mining and Minerals Policy Act of 1970.

In less than a page, the 91st Congress declared that it was the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise. Had this intent been implemented, we might have seen some coordination between agencies and policies.

Ten years later, Congress is making another attempt at setting priorities. The National Materials and Minerals Policy Act of 1980 passed the House and was favorably reported by the Senate Energy Committee. Should it pass into law with the changes made by the Senate, it will provide a strong stepping stone for mineral development. This bill makes the President responsible for identifying, and making recommendations for appropriate policies and programs to ensure adequate, stable and economical materials supplies essential to national security, economic well being and industrial production. But more important, it requires the President to recommend to Congress specific legislative and administrative initiatives necessary to reconcile policy conflicts. This includes an assessment of Federal policies which affect every stage of the materials cycle, from exploration to final use. This is a beginning, a first step warranting the mines magazine • November 1980
closing the mine. Twenty-five days later, danger was found. MSHA persisted inrado was called in. But no imminent
danger in the roof. The mine owners
hired a consultant and the State of Colo­
rado was called in. Among those that fought for a
balanced bill were some from mining
and public land states. Although this
area is designated as a Special Mining
Management Area, the consensus was
too great. This only illustrates Congress' waffling between wilderness
and resource development. While Presi­
dent Carter was signing the Central Idaho Wilderness Bill, he turned to
supporters and quipped, "I'd like to ask
you all to move to the Hill now and help
us with Alaska." They all laughed.

The fate of Alaska lands was already
out of Congress to make needed changes.
We do not have a coalition strong enough
to counteract the environmentalists and
flower sniffers had won again.

Do not be misled. Our problems do not
originate solely from our years of
carter administration. Congress has been
doing its share for a whole lot longer.
Economic stability and national
security have been weakened by more
than just land withdrawals. The govern­
ment has made it easier to rely on
foreign sources than to develop our
own. The strategic and critical materials stockpile has not been sufficiently
stockpiled, but still with some
import dependence just as we have become
dependent on foreign sources of en­
ergy. I know you're not amused by these
statements, 1 feel like I'm preaching to
the choir, because most of my audience
would agree that our dependence on foreign minerals is reaching the crisis
stage. As in energy, however, it may
take a real crisis before the public pays
attention.

Next, and most criminal, inno­
security. It's hard to develop new mining pro­
jects and maintain current production with
laws and regulations that seem to prohibit. I am distressed by the in­
crease in the price of oil. I think this is being a
bleak future—an unstable economy, and
unsure national security. Our
effort is to control and production is being
prohibited. I am distressed by the in­
crease in the price of oil and instability in the economy. It is always
time to increase the prices of oil and
we do not have a coalition strong enough
to counteract the environmentalists and
flower sniffers had won again.

Do not be misled. Our problems do not
originate solely from our years of
carter administration. Congress has been
doing its share for a whole lot longer.
Economic stability and national
security have been weakened by more
than just land withdrawals. The govern­
ment has made it easier to rely on
foreign sources than to develop our
own. The strategic and critical materials stockpile has not been sufficiently
stockpiled, but still with some
import dependence just as we have become
dependent on foreign sources of en­
ergy. I know you're not amused by these
statements, 1 feel like I'm preaching to
the choir, because most of my audience
would agree that our dependence on foreign minerals is reaching the crisis
stage. As in energy, however, it may
take a real crisis before the public pays
attention.

Next, and most criminal, inno­
security. It's hard to develop new mining pro­
jects and maintain current production with
laws and regulations that seem to prohibit. I am distressed by the in­
crease in the price of oil. I think this is being a
bleak future—an unstable economy, and
unsure national security. Our
effort is to control and production is being
prohibited. I am distressed by the in­
crease in the price of oil and instability in the economy. It is always
time to increase the prices of oil and
we do not have a coalition strong enough
to counteract the environmentalists and
flower sniffers had won again.

Do not be misled. Our problems do not
originate solely from our years of
carter administration. Congress has been
doing its share for a whole lot longer.
Economic stability and national
security have been weakened by more
than just land withdrawals. The govern­
ment has made it easier to rely on
foreign sources than to develop our
own. The strategic and critical materials stockpile has not been sufficiently
stockpiled, but still with some
import dependence just as we have become
dependent on foreign sources of en­
ergy. I know you're not amused by these
statements, 1 feel like I'm preaching to
the choir, because most of my audience
would agree that our dependence on foreign minerals is reaching the crisis
stage. As in energy, however, it may
take a real crisis before the public pays
attention.

Next, and most criminal, inno­
security. It's hard to develop new mining pro­
jects and maintain current production with
laws and regulations that seem to prohibit. I am distressed by the in­
crease in the price of oil. I think this is being a
bleak future—an unstable economy, and
unsure national security. Our
effort is to control and production is being
prohibited. I am distressed by the in­
crease in the price of oil and instability in the economy. It is always
time to increase the prices of oil and
we do not have a coalition strong enough
to counteract the environmentalists and
flower sniffers had won again.

Do not be misled. Our problems do not
originate solely from our years of
carter administration. Congress has been
doing its share for a whole lot longer.
Economic stability and national
security have been weakened by more
than just land withdrawals. The govern­
ment has made it easier to rely on
foreign sources than to develop our
own. The strategic and critical materials stockpile has not been sufficiently
stockpiled, but still with some
import dependence just as we have become
dependent on foreign sources of en­
ergy. I know you're not amused by these
statements, 1 feel like I'm preaching to
the choir, because most of my audience
would agree that our dependence on foreign minerals is reaching the crisis
stage. As in energy, however, it may
take a real crisis before the public pays
attention.
The deteriorating environment for business in the United States could fairly be termed, "The Assault on Economic Incentive." Congressman Jack Kemp of New York describes the initial part of the environment thus:

"If you tax something, you get less of it. If you subsidize something, you get more of it. The problem with the United States today is that we tax work, savings, thrift, production, capital, and we subsidize non-work, welfare and consumption."

With the windfall profits tax, we are going to have a lot less domestically produced oil and a lot more Chryslers than natural forces would produce.

Economic growth in the United States has slowed from 4.7% per annum for the six years ending 1968 to 3.4% the first six-year period to the latest six-year period.

Because the climate for private investment has been so poor in recent years, the amount of capital per worker has been declining since 1975. American labor has been deprived of the tools to do the job, and productivity has been in an almost catastrophic downturn.

This has meant higher prices, more inflation and erosion of America's competitive position.

The present real value of $1 invested in 1960, of GNP is $2.45 in Japan 
$2.10 in Africa 
$2.00 in Latin America 
$2.69 in Germany 
$1.29 in the U.S.

In net, international investment advisors at the meeting 'warned against putting money into American capital markets during the next decade unless the U.S. government effects radical changes in the economy such as increasing savings ratios and decreasing government spending.'

Japan and Germany know how to handle foreign trade activities in a much more efficient manner than the U.S.

While the value of oil imports for the U.S. is only 21% of total energy consumption versus 74% and 53%, respectively, for Japan and Germany, and while imports represent the same percent of exports as for Japan—32% and 3 times the 11% rate for Germany. With 5.3% of the world's population the U.S. consumes 41% of the world's total.

The price of gasoline at the pump in the U.S. is only $1.29 per gallon versus:

$2.00 in Latin America
$2.10 in Africa
$2.45 in Japan
$2.75 in the EEC.

Energy is the area that best illustrates poor management and the failure of administration policy in the U.S. Through administered price controls on U.S. domestic production, we have subsidized the consumption of energy—particularly we have subsidized the consumption of our scarce-cased forms of energy—oil and gas—in lieu of increased use of coal which we have almost unlimited supplies.

During the years 1960-71, the price of low sulfur coal was $55 MMBTU. Low sulfur coal was only 12.2% higher in cost than low sulfur residual oil.

All this changed in the early 1970s when, with the imposition of price controls, the price of oil and gas became cheaper than the price of coal.

The price of coal in 1972 was 30.8% and 5.3%, respectively, higher than the price of oil and natural gas. On this basis, and thanks to prodding by the government, many utilities switched from coal to oil and gas.

It is almost incomprehensible that anyone in a responsible position would have taken action that insured (a) the under-utilization of our most abundant energy source and (b) the exhaustion of our oil and gas resources, resulting in the present situation of dependence on imports.

Once in place, it is a formidable task to break the grip of government bureaucracy. Despite recognition of the problem of under-utilization of our coal resources, particularly with the formation of OPEC in 1973, we still have encouraged the use of oil and gas and placed obstacles in the path of increased use of coal. There is no situation that should command greater attention than the coal vs. oil and gas use in the U.S. To meet the need we have to unshackle these industries and let the market forces take command.

There is an almost continuous bar-

**The Deteriorating U.S. Economy**

<table>
<thead>
<tr>
<th></th>
<th>1968</th>
<th>1973</th>
<th>1979</th>
<th>(Deterioration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Federal Spending as % of GNP (Average %)</td>
<td>19.4%</td>
<td>20.6%</td>
<td>22.1%</td>
<td>(13.9%)</td>
</tr>
<tr>
<td>(2) Unemployment Rate (Avg. Ann. % Change)</td>
<td>4.7%</td>
<td>3.4%</td>
<td>2.5%</td>
<td>(46.8%)</td>
</tr>
<tr>
<td>(3) Unemployment Rate (Avg. Ann. % Change)</td>
<td>4.4%</td>
<td>4.7%</td>
<td>6.8%</td>
<td>(54.5%)</td>
</tr>
<tr>
<td>(4) Real Business Investment (Avg. Ann. % Change)</td>
<td>7.3%</td>
<td>4.0%</td>
<td>2.1%</td>
<td>(71.2%)</td>
</tr>
<tr>
<td>(5) Productivity (Avg. Ann. % Change)</td>
<td>3.4%</td>
<td>2.1%</td>
<td>0.6%</td>
<td>(82.4%)</td>
</tr>
<tr>
<td>(6) Inflation (Average, $ Billions)</td>
<td>8.8%</td>
<td>9.2%</td>
<td>8.5%</td>
<td>(58.5%)</td>
</tr>
</tbody>
</table>

This equation: Investment results are low; they are low where government intervention is high where government consumption is low; they are low where government intervention is high where government consumption is low.
tration under-estimated expenditures by $72.3 billion this year, $84,5 billion for productive investment—it has grown to 23% in the latest 5-year period.

Ordinarily, we see government measures of savings that have been instituted over the same time by the TV commercials and domestic oil prices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World Series</td>
<td>$220.00</td>
<td>$220.00</td>
<td>$220.00</td>
<td>$220.00</td>
<td>$220.00</td>
<td>$220.00</td>
</tr>
<tr>
<td>Super Bowl</td>
<td>110.00</td>
<td>110.00</td>
<td>110.00</td>
<td>110.00</td>
<td>110.00</td>
<td>110.00</td>
</tr>
<tr>
<td>Academy Awards</td>
<td>80.00</td>
<td>80.00</td>
<td>80.00</td>
<td>80.00</td>
<td>80.00</td>
<td>80.00</td>
</tr>
<tr>
<td>Wide World of Sports</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Summer Olympics (a)</td>
<td>42.00</td>
<td>42.00</td>
<td>42.00</td>
<td>42.00</td>
<td>42.00</td>
<td>42.00</td>
</tr>
<tr>
<td>Winter Olympics (a)</td>
<td>36.00</td>
<td>36.00</td>
<td>36.00</td>
<td>36.00</td>
<td>36.00</td>
<td>36.00</td>
</tr>
</tbody>
</table>

Cost of a Barrel of Oil

<table>
<thead>
<tr>
<th>(a) 1976-1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
</tr>
<tr>
<td>$5.03</td>
</tr>
<tr>
<td>$6.00</td>
</tr>
<tr>
<td>$6.24</td>
</tr>
<tr>
<td>$6.60</td>
</tr>
<tr>
<td>$6.84</td>
</tr>
</tbody>
</table>

Food Stamp Program

The Congressional Budget Office has identified duplications in the Food Stamp Programs which, if eliminated, could save $1.5 billion per year in 1985.

These two items are simply examples of possibilities for savings on transfer payments that would yield net gains in economic growth, the defeat the intent of the programs.

By improving the accuracy of estimates of government programs that are used to boost national output, it is increasing the cost of living for all Americans. The Congressional Budget Office has not hesitated to identify this as a potential measure of the problem of the ever-expanding scale of government programs. We must do to the reverse the decline in the U.S. economy.

In the years 1972-1979, taxes on this income due purely to inflation over the $25,000 income that was due to inflation. The tax reductions enacted from 1972 to 1979 reduced the average savings rate in the U.S. economy increased from 5.1% to 6.9%. Taking into account the inflation of $25,000 per cent, in constant 1979 dollars, the income tax cut over the years 1972-1979, taxes on this income increased by $252 as inflation pushed this portion of the income above the statutory non-income tax. The tax reductions enacted from 1972 to 1979 reduced the tax on this $25,000 of income by $450. In net, there was an increase in the tax on the $25,000 income of $443 from 1972 to 1979. The politicians don't tell us this. They don't tell us that their tax reductions offset only 52.2% of the automatic tax increase on a $25,000 income that was due to inflation alone.

This point is that the government is preeminent more and more of the total economy and squeezing out the private sector.

Personal Taxes on a percent of personal income, have increased from looking control of an increasingly larger proportion of their income, since it is being preempted by government. In effect, the government is telling us how our money should spend and how our money should be spent. This is the basis for serious threat to our personal and economic freedom.

We move now to the key issue of the proposed reduction in the capital gains tax to 20%, if inflation got down to a sustained 3% annual rate, with the proposed 20% capital gains tax that would still be turned into a 0.5% average annual rate after tax loss.

Conceptually, there is no basis for any capital gains tax whatsoever on long-term investments. By definition, such tax reduces the capital formation process which is so essential to taking adequate productivity and economic growth. Thus, on grounds of inflation, we have hesitated to identify this as a potential measure of the problem of the ever-expanding scale of government programs. We must do to the reverse the decline in the U.S. economy.

The problem of high tax rates is, as we have been, compounded by inflation. As inflation goes up, so do tax revenues—only at a much faster rate. The impact is particularly severe on...
Specialists in Mineral and Chemical Processing Extensive Laboratories & Pilot Plants

- Process Development Evaluation
- Analytical Services—Mineral Standards
- Process-Economic Studies
- Pilot Plant Design—Operation
- Geotechnical Services—Pollution Studies—Equipment
- Bench Scale and Pilot Plant Studies

Hazen Research, Inc.
3601 S. Illinois St., Champaign, IL 61820
(217) 328-1726

Colorado Mineral Brokers
Roy Kirkman
1120 Vinyard Rd., Glenwood Springs, CO
(970) 945-6700

Real Defense Spending U.S. vs. U.S.S.R.

<table>
<thead>
<tr>
<th>Year</th>
<th>U.S.S.R.</th>
<th>U.S.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>120.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Comparison of Media and Oil Company Profits

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Media Company</th>
<th>Oil Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dow Jones</td>
<td>Media Company</td>
</tr>
<tr>
<td>2</td>
<td>Time Mirror</td>
<td>Media Company</td>
</tr>
<tr>
<td>3</td>
<td>Washington Post</td>
<td>Media Company</td>
</tr>
<tr>
<td>4</td>
<td>American Banking &amp; Trust</td>
<td>Media Company</td>
</tr>
<tr>
<td>5</td>
<td>McClain Hill</td>
<td>Media Company</td>
</tr>
<tr>
<td>6</td>
<td>CBS</td>
<td>Media Company</td>
</tr>
<tr>
<td>7</td>
<td>Standard of California</td>
<td>Oil Company</td>
</tr>
<tr>
<td>8</td>
<td>Exxon</td>
<td>Oil Company</td>
</tr>
<tr>
<td>9</td>
<td>Mobil</td>
<td>Oil Company</td>
</tr>
<tr>
<td>10</td>
<td>Standard of Indiana</td>
<td>Oil Company</td>
</tr>
<tr>
<td>11</td>
<td>New York Times</td>
<td>Oil Company</td>
</tr>
<tr>
<td>12</td>
<td>America enrich</td>
<td>Oil Company</td>
</tr>
<tr>
<td>13</td>
<td>RCA</td>
<td>Oil Company</td>
</tr>
<tr>
<td>14</td>
<td>Shell</td>
<td>Oil Company</td>
</tr>
<tr>
<td>15</td>
<td>Union Oil Company</td>
<td>Oil Company</td>
</tr>
<tr>
<td>16</td>
<td>Time, Inc.</td>
<td>Oil Company</td>
</tr>
<tr>
<td>17</td>
<td>Texaco</td>
<td>Oil Company</td>
</tr>
</tbody>
</table>

A. George Setter '32

Ford Times Mirror

Comparison of U.S. and Soviet Defense Outlays

<table>
<thead>
<tr>
<th>Year</th>
<th>U.S.S.R.</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>120.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Five Action Recommendations

(1) Balance the Budget over the Business Cycle
(2) Cut Top Personal Tax Rate to 26%
(3) Adjust All Personal and Corporate Property Taxes
(4) Eliminate the Capital Gains Tax
(5) Manage Agricultural Exports to Strengthen the U.S. Economy.

The total of these losses, amounting to $20.3 billion. The last 30 years. Between January 1st, 1950 and April 30th, 1980, the U.S. Government sold 403.3 million troy ounces of our gold reserves. There were sold at an average price of $44.2 billion which compared with the average price of about $500. Because of the sale of these reserves at the lower price, the U.S. Government realized ($197.3 billion) less than would have been the case if the reserves had been kept and sold of $500 on an ounce.

CROPEC
These people, Malcolm Fraser of Canada, Pierre Trudeau of Canada and General Videla of Argentina are the only ones who would have reached an agreement with to control wheat, corn and soybean export prices to the same extent as 11 to 24 nations control oil prices. If our power would be decreased. These are the people who make the gold stock? We have to we got to look at. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings.

Five Action Recommendations

(1) Balance the Budget over the Business Cycle
(2) Cut Top Personal Tax Rate to 26%
(3) Adjust All Personal and Corporate Property Taxes
(4) Eliminate the Capital Gains Tax
(5) Manage Agricultural Exports to Strengthen the U.S. Economy.

The total of these losses, amounting to $20.3 billion. The last 30 years. Between January 1st, 1950 and April 30th, 1980, the U.S. Government sold 403.3 million troy ounces of our gold reserves. There were sold at an average price of $44.2 billion which compared with the average price of about $500. Because of the sale of these reserves at the lower price, the U.S. Government realized ($197.3 billion) less than would have been the case if the reserves had been kept and sold of $500 on an ounce. Additionally, with regard to silver, the loss is ($20.0) billion. The total of these two losses, amounting to another $77.3 billion or less than 8% of the original pension. It is among the people who make the gold stock? We have to we got to look at. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings.

CROPEC
These people, Malcolm Fraser of Canada, Pierre Trudeau of Canada and General Videla of Argentina are the only ones who would have reached an agreement with to control wheat, corn and soybean export prices to the same extent as 11 to 24 nations control oil prices. If our power would be decreased. These are the people who make the gold stock? We have to we got to look at. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings. We have to look at the tax rate on savings.
Athletics and Academics
by Kathleen B. Johnson

"Challenging the young people at Mines toward excellence..."

"It has always been an integral part of the Mines scene," says Mary Kay, head football coach for the Colorado School of Mines. "It was a very integral part of the football program. From the very beginning, it was a football program." The administration feels athletics are important to Mines students. "It's always a challenge," Pat Dyer, head trainer, comments. "We are very fortunate," muses Joe Davies, 53-year veteran of coaching at Mines. "We have a tradition of football." According to the "History of the Colorado School of Mines," written by Mary Hoyt, the first formal recognition of athletics at Mines was in 1882. They voted an appropriation of $250 to equip a gymnasium in the basement of the first building on campus. That support was continued through the years and is now ingrained as a tradition of the school's administration, faculty and students. "It's not easy to coach here," says Jim Darden, a 26-year veteran of basketball and baseball coaching. "There is always a challenge." The biggest challenge according to the entire coaching staff, is to balance athletics with academics. Time, for academics and sports in one of the toughest engineering schools in the country, is not in abundance for either faculty or students. There is a great deal of respect for student athletes," believes Bob Pearson, business manager for the past 15 years, currently soccer coach and assistant in basketball. "Both faculty and students see athletics as a good release of the pressures at Mines. The students sacrifice their after school hours to participate." The coaches agree that the Mines atmosphere is a rare one. As Bob McCandless, swim team coach and assistant football coach, puts it, "Academics have first priority. One can attain equal excellence in both, but academics should not be an excuse for poor academic performance, nor should athletics be an excuse for poor academic performance." The student athlete at Mines is just that—a student first who also happens to participate in sports. "If the student is not prepared in class or if he uses class as an excuse for poor athletics," continued McCandless, "then either the professor or the coach has a right to jump on him." Pat Dyer, head trainer, comments that, "No one is twisting the arm of the student athlete to participate. Yet every kid, no matter what, gives the best possible." In the beginning, all games were on an intramural basis. The first games, cricket and rugby, eventually evolved into football. Baseball was already a top contender in the 1860's. Over the years, there has been an increase in both the number of sports offered and the support they receive. The 12 intercollegiate programs offered today are football, basketball, track, cross country, baseball, wrestling, swimming, soccer, tennis, golf, skiing, and rifle. These sports, and others, are also available through intramurals. "Today Mines has the largest men's program in the West," athletic director Bruce Allison says proudly. A study of authoritative sources, including the National Directory of College Athletics and the Blue Book of College Athletics, reveals that Mines does indeed have one of the broadest, most comprehensive programs of physical education and athletics of any institution in the nation, devoted solely to engineering education. In many respects, it exists that offered by the majority of small and medium sized liberal arts colleges and universities. "Mines still requires four separate semesters of physical education to graduate. In a day and age when most schools have given up such requirements," remarks Bruce Allison, "athletics is more than ever a part of the school. It is established in the minds of the Trustees, the faculty and the students." A look around the campus will confirm Allison's opinion. Besides the collegiate and intramural activities that continue year round, one can see many impromptu and unofficial sports in progress. Skiing practice sessions, frisbee, and informal lunch-hour basketball sessions are always popular. And if one looks up to the "M" on a windy day, there will likely be several brave souls hanging gliding off the top of a mountain. "Most of the students I have talked to," states Gail Klock, the new coach this year for women's basketball and volleyball, "say they play for a break from studying. They see athletics as an important part of their social life and a way to meet new people." The average Mines student carries between 17 and 20 hours of tough engineering courses per semester. The heavy scholastic pressure curtails the time available for practice. It also discourages some good high school athletes from enrolling. "The students support the athletics," says Mary Kay. "The support is one percent of men and even fewer women move from intercollegiate athletics into the pros; however, the Mines students will devote years to their engineering careers. Joe Davies feels companies are looking for well-rounded students and, along with an engineering degree, that..."
Enjoy A MOST INVITING WEEKEND in vibrant Casper any Friday or Saturday night, only at Casper’s Ramada Inn. Here’s what you’ll get:

- Overnight accommodations for a family of up to five at the single occupancy rate - special rates for larger families too!
- Our famous V.I.P. Wine & Cheese Tray absolutely free.
- Plus traditional Ramada care and much more with advance reservations and subject to room availability, so make your reservations now!

Casper’s Ramada Inn
1-25 at Center St. Exit 178
Casper, WY 82601
Phone (307) 323-5713

There’s No Place More Inviting

A MOST INVITING WEEKEND
For The Entire Family

When a program means the difference between success or failure as an engineer or manager, it becomes more than just another program. When there’s a crisis at hand, a good engineer will not wait to react. The best of engineers will turn it into expanding opportunity.

A new program which the CSM Alumni Association is spearheading through The Resource Fund is designed to meet the needs of the future by providing much-needed financial assistance to students in order to improve the School’s educational programs. The success of the new program will be important not only for students and industry, but also for the nation as a whole. It needs medical and mineral energy resources.

What is the program? The Boards of Trustees and Directors of the School, the Foundation and the Alumni Association agreed on October 1, 1980, that the CSM Alumni Association should be given the opportunity of organizing and directing the Annual Student Assistance Program (ASAP) of The Resource Fund. The old and successful Annual Alumni Development Fund (ASD) has been replaced by this new and hopefully even more successful program.

ASAP is part of The Resource Fund, which has been called “the boldest, most imaginative venture ever launched by the School in its long history.” The Resource Fund has established an experimental financial support to maintain and improve the School’s standards of excellence, and has espoused over $50 million through corporations, foundations and individuals since its inception in 1977 to strengthen School programs.

If success follows the program at the right time to strengthen CSM and all of resource engineering, join with us in supporting the Annual Student Assistance Program of The Resource Fund with your gift whatever your degree from Mines and your personal success and well-being. The success came in large measure through hard work meeting the rigorous Mines education. Meeting this challenge with a generous response will help Mines meet its tremendous responsibilities toward this student generation and, with continued support, for generations to come.

The Annual Student Assistance Program of The Resource Fund is the right program at the right time to strengthen CSM and all of resource engineering. We’re already mentioned the student cost crunch. We’ll like to provide a student loan and grant aid to enable deserving and hard-working students in need to continue their studies at CSM. If we can establish a successful program over perhaps a 10-year period, with careful administration, the program will become self-supporting and revolving.

The Alumni Association volunteers will be in touch with Section leadership in every area, with details and to invite each alumni to participate. As the program progresses, you will be kept informed of our advances toward our goals. This is very much your program as a graduate, its success depends upon you and upon all of us.

When you are called upon by an Alumni Volunteer, please think back to what your degree from Mines has meant to you toward your personal success and well-being. The success came in large measure through hard work meeting the rigorous Mines education. Meeting this challenge with a generous response will help Mines meet its tremendous responsibilities toward this student generation and, with continued support, for generations to come.

The Annual Student Assistance Program of The Resource Fund is the right program at the right time to strengthen CSM and all of resource engineering. Join with us in supporting the Annual Student Assistance Program of your fair share and commitment. With the nation, we’ll share in its success.

ROY C. KIRKMAN, President

Petroleum Consultant
Planning/Management/Appraisal

LLOYD E. ELKINS '34

Petroleum Engineering Services
Reservoir Engineering through Operation
Denver, CO 80223 (303) 936-4994

Austra Resources Corporation
PETROLEUM ENGINEERING SERVICES
Reservoir Engineer through Operations
Douglas R. Type, VP
Worley & Vagula, '78

1160 S. ELAY LITTLEFIELD, CO 80025

EXPLORATION RESEARCH AND ANALISI

LEWIS H. ROSS

Roy Hibbs Exploration Consultants

1301 Executive Blvd. Suite 200
Boulder, CO 80303 (303) 494-0250

the mines magazine » november 1980

the mines magazine » november 1980


ASAP IS PART OF THE RESOURCE FUND, WHICH HAS BEEN CALLED "THE BOLDEST, MOST IMAGINATIVE VENUE EVER LAUNCHED BY THE SCHOOL IN ITS LONG HISTORY." THE RESOURCE FUND HAS ESTABLISHED AN EXPERIMENTAL FINANCIAL SUPPORT TO MAINTAIN AND IMPROVE THE SCHOOL'S STANDARDS OF EXCELLENCE, AND HAS ESPoused OVER $50 MILLION THROUGH CORPORATIONS, FOUNDATIONS AND INDIVIDUALS SINCE ITS INCEPTION IN 1977 TO STRENGTHEN SCHOOL PROGRAMS.

If success follows the program at the right time to strengthen CSM and all of resource engineering, join with us in supporting the Annual Student Assistance Program of The Resource Fund with your gift whatever your degree from Mines and your personal success and well-being. The success came in large measure through hard work meeting the rigorous Mines education. Meeting this challenge with a generous response will help Mines meet its tremendous responsibilities toward this student generation and, with continued support, for generations to come.
24

25

The Denver Federal District Court Judge, however, felt differently. "Ten years had
been wasted by the Mint at lawlessness."

A reporter asked Harrington why he did it. "Most people enter into any enter-
prise with a desire for independence. I had ambitions for my family. What right-thinking
man doesn't?"

"38 At Noblet, E.M., retired Col, U.S.
Army, recently went steeping from the Sante Fe Times and Baywood, the Pacific
Western Airlines flight magazine, August, 1900. All dealt with various aspects of the
racing industry in the Puget Sound area of Washington. One referred to a Washington
engineer who believes those wanting to learn a trade must do so "on the job" because
higher academic levels are "not sufficiently practiced" to teach the technology!

"53 George W. Mitchell, E.B., has
raised the standard of the CSM Alumni As-
sociation. He has founded Fugro Rocky
Mountain, in Golden, as their director of
marketing. Philip W. Townsend, P.E., has
been elected a member of the Rocky
Mountain U.S. Inc. in Houston. He was formerly
that company's executive vice president.

"49 Gregory H. Hayd, E.M., has
recently been promoted to vice president—development
for AMAX's Climax Molybdenum Company. He was
vice president and general manager of the Climax Mine near
Leadville, Colorado.

"70 John T. Carson, Geop., is now in
Addis Ababa, Ethiopia, as an executive
administrative service engineer for the
Water and Sovereignty Agency.

"59 Gary E. Meliclan, Geop., is director of
planning for Danos and Moore. He had been
that company's director of mining.

"78 Patrick A. Ley, BSc.Math,
(formerly with the Climax Division of
CFSI Steel Corporation, He was previousiy
superintendent of steel production. John N. (Nick) Tenkely is now vice presi-
dent of the Wilkinson Company, is now
vice president of that company in California.

"31 Reginald Worsley, MSc.Min., is
currently with Canadian Equipment Sales
& Service Co., Ltd. in Calgary, Alberta.

"66 George H. Conkling, Geol.E., and
Geol-68, is currently district explora-
tion geologist for the Bureau of Mines in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp.

"74 Thomas L. Breniger, BSc.CPR,
has been promoted from process engineer to gas
plant superintendent for Marathon Oil Co. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P. Schissier, BSc.Min., has
recently been promoted to associate geologist in their
Fugro Rocky Mountain U.S. Corp. in
California. Andrew P.
Not all Engineers end up in design...

...our Engineers end up in command!

As one of the nation's leading recruiters of entry-level engineers, Schlumberger wants you to be aware of the alternative career opportunities awaiting you after graduation. Not all engineers sit behind a desk...

our engineers take command outdoors.

After an initial 6-month training program, you will have mastered the art of interpreting complex well logging data. You'll be an engineering consultant, troubleshooter and supervisor, working a continuous schedule of 9 days on call, then 3 days off.

To be considered, you must have a 4-year degree in ME, EE, PetE, Physics, or Geophysics. You must be capable of working long hours at remote oil and gas well sites. Your interpersonal skills must qualify you to be an assertive team leader as well as a diplomatic client consultant.

Your benefit package will include 21 days vacation, a company car, expense account and monthly bonuses.

At Schlumberger, we promote totally from within. We only hire those individuals who show us the potential to move up. If autonomy, self-reliance and decision-making are your strengths, you might find yourself at Schlumberger too.

Openings throughout the Western United States

4-year degree required!

Please call collect: (303) 534-7500 or write: Schlumberger Well Services Attn: Personnel Recruiting Suite 1700, 410 17th Street Denver, Colorado 80202

We are an Equal Opportunity Employer M/F/H

President—one year term

THOMAS M. SMAIGALA, BSc,Geoop. 1974, is Manager, Geology-Geophys., Rocky Mountain Southern Region for Pendleton Land and Exploration, Inc., Denver, CO. Prior to that he worked for Kansas-Nebraska Natural Gas as Manager-Geology. Smaila has served as Secretary, Treasurer and is completing a term as Vice President for the Alumni Association.

Treasurer—one year term

ROBERT T. REEDER, E.M. 1949, MSc,Min.Econ. 1976, is presently Associate Professor for CSM Mining Engineering Department. He has extensive experience in mine production administration. Reeder is owner and President of the Remenoco Corp., a mining engineering and management consulting company. He has been a member of the Alumni Board as a Director, 3-year term, and is completing a term as Secretary.

Secretary—one year term

EDWARD M. WARREN, Geol. E. 1950 is presently vice president of Petroleco Corp. He was formerly with Texaco Petroleum Research Corp., Burton Companies, H. J. Parker, independent owner and consultant. He is a Certified Petroleum Geologist and a member of AAPG and a Certified Professional Geological Scientist. He has served in the US Air Force as a service officer, Corps of Engineers, in World War II. Warren has been a member of the CSMAA for 30 years, since his graduation, and has held several offices in the South Texas Alumni Section. He has lived in Evergreen for the past 4 years.

Director—3 year term

MAX E. COATS E.M. 1935 was a mixing engineer with ASARCO, Inc. for 41 years. His experience includes: control technician, operator, supervisor and manager. He retired in 1976. He has served the Alumni Association in Placement Service and is on the Board of Colorado Mining Association. He has been with the Alumni Board as a Director, 3-year term, and is completing a term as Treasurer.

the mines magazine • November 1980
Director—3 year term

VICKI J. COWART, MSc. Geop. 1977 is an exploration geophysicist with Mobil; offshore California and the Rocky Mountain Basins. She graduated from Polytechnic Institute with distinction and moved to Golden in 1975. She has one publication: "Mossbauer Spectroscopy Investigation of Clinker Rocks." Cowart was the founding president of the Denver Chapter of the Association of Geophysical Scientists and now resides in Denver.

Director—3 year term

LEE ANN MARX, BSc. B.E. 1976 is a native of Denver. She has been with Gates Rubber Co. since graduation. Marx is now a project engineer—belts and equipment engineering. She is a past president of the Denver Section of the Society of Women Engineers and has held various offices in the Society of Automotive Engineers of Colorado. Currently a director of the Colorado Engineering Council, she is active in community affairs and is a member of the Professional Engineers of Colorado. She has been a member of the Association since graduation and resides in Denver.

Director-at-Large—2 year term

GARY L. NYDEGGER, BSc. Geol. 1974, MSc. Min.Econ. 1978 is an oil and gas exploration consultant and has recently opened an office in Denver for Mormon Oil and Gas Co. of Corpus Christi, TX. Prior to this he was employed by Kansas-Nebraska Natural Gas Co. He has been chairman of the CSMAA Membership Committee and is presently chairman of the Placement Committee. Nydegger received his master's degree while attending CSM part-time and resides in Golden.

Director-at-Large—2 year term

STEWART G. SQUIRES, BSc. Geop. 1974, is a geophysicist for Kansas-Nebraska Natural Gas Co., Inc., Lakewood, CO. After graduation from Mines he served with the U.S. Army Corps of Engineers and was employed by Kansas-Nebraska as a geologist. He has been active on the CSMAA Membership and Finance Committee and is presently chairman of the Publications Committee. Squires lives in Littleton.
Athos C. Segerne

Athos C. Segerne, BSc, M.932, died of cancer on June 7, 1980. While at Mines he was a member of Alpha Tau Omega nationally. He later worked for New Jersey Zinc Company. He is survived by his wife who resides in Ogdensburg, New Jersey.

Hilton C. Kearny

Hilton C. Kearny, BSc, M.979, died July 9, 1980. He was working on his thesis at Mines to obtain a master in Mineral Economics at the time of his death. Born in San Antonio, Texas, in 1903, Kearny’s family moved to Colorado Springs in 1905. He graduated from Mines in 1925, having been on the CSAM swim team for four years, most valuable swimmer two years, and was voted outstanding senior athlete.

During the summers of his college years he worked for Consolidated Coal Company and AMAX, Henderson Mines. Upon graduation he became sales engineer for Ingersoll-Rand. From 1939 until his retirement in 1971, he worked for several steel companies in Ohio, Exploration Department in Tulsa, Oklahoma, and the Sigma Phi Epsilon fraternity. He was a member of the Colorado Bar Association and the Denver Masonic Lodge. Surviving are his former wife, the former Kathleen Walls of Brighton, Colorado, two daughters, one son and three sisters.

Malcolm E. Celler

Malcolm E. Celler, E. M. 1922 and Hon. Mem. 1968, died August 28, 1980, at Lutheran Medical Center in Denver. He was 80 at the time of his death.

A native of Denver and veteran of World War II, Celler began his career with Mines in 1922 and the University of Colorado School of Law in 1925. He was a practicing attorney until 1971. From 1930 until his retirement in 1971, Celler was president of First Federal Savings and served as a director from 1925 to 1970. He was president of the Savings and Loan League of Colorado in 1942 and 1950 and a director of the Federal Home Loan Bank Board in 1942 and 1944. Celler was a member of the Colorado House of Representatives in 1930-1934 and the Denver Election Commission 1924 to 1940. He served on the board of directors of the Lakewood and North Table Mountain water and Sewer Districts and on the Jefferson County Board of Adjustments.

For a number of years he served as supervisor of the Denver Public Schools. Celler received the Alumni Award of Merit from the School of Mines, the CU Alumni Association, and the Sigma Phi Epsilon fraternity. He was a member of Sigma Phi Epsilon fraternity, the Colorado Bar Association and the Denver Masonic Lodge. Surviving are his former wife, the former Kathleen Walls of Brighton, Colorado, two daughters, one son and three sisters.

David H. Singer

David Horace Singer, Geo E. 1960, died on January 20, 1970, at the age of 56. Born in Colorado City, he attended school in Youngstown, Ohio, and attended college in Youngstown. In 1917, he received a degree in Chemistry. During his years in college he took time off to work for several steel companies in Ohio. After his graduation from Mines in 1925 he joined Arkansas Fuel Oil Corporation in Shreveport, Louisiana. He was staff geologist in their Development Department. He later worked in the Exploration Department in Tulsa, Oklahoma. He is survived by his wife, Helen, to whom he was married in Walker, Florida.

BART DE LAUT CONSULTANTS
Petroleum & Natural Gas
Nee, DeLatt, F.E. 1980
P.O. Box 4078
Commerce City, Colorado 80022
(303) 279-9050

Warren H. Yearoll, ‘34
Registered Professional Engineer Consulting Engineer
(303) 270-9300
17221 W. 18th Ave. Golden, Colo. 80401

Dale L. Pinkerton, ‘57
President
P.O. Box 429
Commerce City, Colo. 80022
OFFICE PHONE: (303) 279-4181
HOME PHONE: (303) 279-4191

Fred Fox ’54
Bill Thornley ’48 Ex.
Don Taylor ’77
Mike Brazel ’75, ’79
Ed Ford ’79

Hydrogeology
Engineering Geology
Soil and Rock Mechanics
Construction Quality Control
Construction Materials Testing and Engineering

303 / 322-1974
THE MINES MAGAZINE
November, 1980

G. H. Bryant, ’53
Consulting Services for Coal and Uranium
434 Inverness Drive East
Englewood, CO 80110
(303) 779-3322

the mines magazine • November 1980

ROBERTO AGUILERA, ’69 & ’76
& Associates, Inc.
International Petroleum Consultants
Naturally Fractured Reservoirs
Log Interpretation • Well Test Analysis
Performance Forecasts • Economics
Petaluma Short Courses
P.O. Box 478
Irvine, CA 92714
(714) 254-9211

BEAR POLE RANCH
Boulder, Colorado
Skiing & Snowboarding
Cross-Country Skiing
Snowshoeing
Horseback Riding
(P) Box 118
Lakewood, Colo. 80227

THE MINES MAGAZINE
November, 1980

Copyright © 1980, Colorado School of Mines
All rights reserved. No part of this magazine may be reproduced in any form without permission in writing from the publisher.
Uranium Technology

Many people find themselves concerned about the issue of nuclear energy as they are asked to think about the facts and opinions throughout the media and industry.

The Colorado School of Mines Continuing Education Office has a way of putting it all together. "Uranium Technology, An Introductory Two Day Short Course," is being offered November 6-7 and December 11-12.

This intensive course examines the nuclear fuel cycle from geology, mining, milling, enrichment and fabrication to fuel use in reactors and waste disposal options. The front-end aspects of the fuel cycle—exploration, mining, milling and their related environmental aspects—are emphasized.

Now in its third year, this course has been updated to reflect changes in technologies, issues, and policies throughout the media and public opinion. The course is based on nonmathematical understanding of nuclear physics and reactor theory, the roles of the federal government and industry, state and federal energy agencies, executives, and secretaries.

The lectures provide an overview and analysis of geology, geochemistry, and geophysics in locating uranium concentrations. What instruments are used? How do they work? How are samples handled, analyzed, and evaluated? What mining—What constitutes a mineable deposit? What recovery methods should be used? Conventional mining—open pit and underground—is contrasted with solution mining, leach mining, byproduct recovery from phosphate and copper—the current uranium mining techniques.

Alternative processing methods are examined. Environmental issues related to mining and milling are covered in detail. How do mining and milling affect the health of employees and the nearby public? What is the natural radiation background? How is radiation measured? What do "millicurie," "picocurie" and "working level" mean? How is the safety level of radiation exposure? What are the biological effects of ionizing radiations? How can radiation be controlled in mining, milling, and tailings disposal? In addition to these environmental issues, the roles of the federal regulatory agencies, EPA and NRC, are examined. Lectures are supplemented with relevant films and much of the course data presented as slides is provided as handout material. Data used are documented for further reading.

The course is presented by Dr. Jerome G. Morse, adjunct professor of physics at Colorado School of Mines. Dr. Morse is a fellow of the American Nuclear Society and consultant to the Colorado uranium industry, state and federal energy agencies. He is co-editor-in-chief of the International Journal of Uranium and has recently published "Nuclear Methods in Mineral Exploration and Production" (1977) and "Energy Resources, Coal, Oil Shale and Uranium" (1979). Registration should be received one week prior to the date of the course. Make checks payable to "Colorado School of Mines." Mail to: Director of Continuing Education, Colorado School of Mines, Golden, Colorado 80401. Telephone: (303) 798-3030, ext. 2312.

If there is insufficient enrollment, CSM reserves the right to cancel the course. Cancellation after one week prior to course begins subject to a $50.00 charge.

SEISMIC CORDS AND SERVICE

PRIMACORD® DETONATING CORDS

INTRODUCES

Non-electric surface and underground blast initiation systems—for the hole delays—for noiseless surface delays—for noiseless lead-in-line—For LP & MS series of underground delays.

Mines Men To Help You

John Feaster 72
Western Regional Mgr., Cables/Service
(303) 798-8625
enon

Louviers, Colo. / (303) 798-8625

33
Asarco has been purchasing nonferrous ores and concentrates since 1899. As the world's largest and most diversified smelter and refiner, Asarco continues to buy large quantities of mine outputs for its smelters and refineries.

In addition to ores and concentrates, Asarco buys residues, blister, bullion, precipitates and scrap containing gold, silver, copper, lead and zinc. Asarco buys by the truckload, carload and shipload from small and large suppliers.

**Consuming Locations in the United States**

- **Copper Smelters**: El Paso, Texas; Hayden, Arizona; Tacoma, Washington.
- **Lead Smelters**: East Helena, Montana; El Paso, Texas; Glover, Missouri.
- **Copper Refinery**: Amarillo, Texas.
- **Lead Refineries**: Glover, Missouri; Omaha, Nebraska.
- **Zinc Refinery**: Corpus Christi, Texas.
- **Cadmium and Indium Plant**: Denver, Colorado.

For more information, write to the Ore Department, ASARCO Incorporated, 120 Broadway, New York, N.Y. 10271 or Southwestern Ore Purchasing Department, PO. Box 5747, Tucson, Arizona 85703.

**Scholarships**

by David Smith-Garbett

In response to the call for increased support for student financial aid at Colorado School of Mines, a number of scholarships have been established.

- **Malcolm E. Collier Scholarships**: Established in memory of Malcolm E. Collier, Sr., president and a director of First Federal Savings and Loan of Denver for over fifty years, the endowment will provide scholarships for students of demonstrated need. Mr. Collier was a 1922 graduate of CSM and recipient of the Distinguished Service Award in 1965.
- **Kaiser Aluminum Scholarships**: Formed to provide Kaiser Aluminum and Chemical's scholarship fund fellowship program on a "permanent and continuing basis," the endowed fellowship will place special emphasis upon providing aid to well-qualified minority students and women.
- **Stephen and Anna Hui Endowed Fellowships**: Established by Stephen S. F. Hui, CSM Medalist and 1940 master's recipient in geological engineering, and his wife, the fund will provide fellowships for graduate students at CSM holding undergraduate degrees from universities in Hong Kong, the Republic of China or the People's Republic of China who wish to pursue advanced studies in mineral engineering at CSM. Twenty students from the region are currently enrolled at CSM.
- **Robert H. Sayre Scholarships**: Robert H. Sayre, Jr., and his wife Bonney McDonald Sayre, established an endowment in the memory of his father for scholarships for "deserving bright achievers" at CSM. Robert H. Sayre, Sr., contributed extensively to the international minerals community during his lifetime. He served as a Trustee at CSM from 1924 to 1936 and as President of the Board for two terms. Robert H. Sayre, Jr., is a 1934 graduate in mining and geology. He received CSM's Distinguished Achievement Award in 1976.

The following funds are also new or were recently increased:

- **R. C. Baker Foundation Petroleum Engineering Scholarships**: Increased support was received for this program of long standing to meet rising expenses of recipients.
- **Massey Foundation Scholarships**: Newly established, the fund will provide scholarships for students demonstrating the leadership potential for contributing to the U.S. coal industry.
- **Union Oil Company Foundation Academic Scholarships**: A new fund established to assist and encourage outstanding women and minority students in their studies at CSM, this long-range program is in addition to the Foundation's Departmental Scholarship Program, which also received increased support this year.
- **Littke/Golden Geophysical Scholarships**: This first-time contribution to the scholarship effort will provide scholarships for the coming year.

While noted that the overall scholarship and fellowship program has increased through the outstanding assistance of a number of volunteer fund-raisers. These participants in the scholarship access join over 75 companies, associations, and foundations, as well as numerous individuals who are providing substantial support to CSM through the financial aid program.
The Colorado School of Mines Rugby Club is approaching the end of its 14th successful year on campus. The club fields two sides every weekend in the fall and spring seasons and currently plays in the A-2 division of the Eastern Rockies Rugby Football Union (ERRFU). The club placed second in the division in 1979 and was 14-4-1 for the '79-'80 year. Mines is a strong contender for first in the division this year and has a large number of experienced returning and transferring players.

The club is exactly that, and is supported by funds from student council, not the athletic department, plus dues from the members of the club.

football coach at Mines, and Ron (EM '69) and Bob (EM '70) Bills. Mines was the first rugby club in Colorado and played against the CU club. Mines won 8-3. They also won the other two games, played against CU that spring. Mines was one of the charter members in the Eastern Rockies Rugby Football Union in the spring of 1968. That same spring Mines won the first Coor's Cup denoting the top team in ERRFU. In the fall of 1969 Mines won the first seven-a-sides tourney in ERRFU. The club has always fielded a team in the fall and spring seasons but, until recently, has traditionally been stronger, both in numbers and ability, in the spring because of the influx of football players in the spring season. During the last two or three years the club has established a strong core of approximately 20-25 experienced players that assure the club consistently strong teams in both the fall and spring.

The club has been coached in the past usually by the most experienced players on the team such as Marv Kay and the Bills Brothers but has had help from faculty members such as Bill Astle (Math Dept). The club is currently coached by Rick Carlson (Met.E. '70) a grad student at Mines and a member of the original 1967 team.

In 1967, this hardy group revived the sport of rugby on the Mines campus. Some familiar faces are still around—Willy Mitchell and Marv Kay, both faculty members at CSM. Rick Carlson is a graduate student and coach of the current ruggers. Photo: Courtesy of Rick Carlson.

NATIONAL WESTERN MINING CONFERENCE
FEBRUARY 11, 12 & 13, 1981
Denver Fairmont Hotel
EXHIBITS & SESSIONS
Legislation • Economics
Mineral Processing • Exploration
Small Operators • Oil Shale
for more information contact
COLORADO MINING ASSOCIATION
230 Denver National Office Bldg
1515 National Office Bldg
Denver, Colorado 80202
(303) 628-8000

Engineering and Equipment Service
for Mines—Mills—Industrial Plants
Pollution Control Equipment—Design
and Pumps, Crane, Fans
Centrifugal Exhausters
PATTEN ENGINEERING CO.
1740 W. 13th Ave. Denver 80204
(303) 832-833

WORK YOUR WAY TO THE BOTTOM
When you come to work for Gulf, you could be
finding yourself drilling for oil at the bottom of the ocean. Or seeking natural gas at the bottom of the Arctic Circle.

Because the bottom line in energy exploration means we have to search in strange, difficult places, all over the world. We travel people, talent, skill and imagination to join in the search.

Not only to find oil and gas, but to explore new alternatives as well.

GULF PEOPLE: ENERGY FOR TOMORROW
Football

Marry Kay is not a happy player after losing to Southern Utah, 20-17.

"I don't mind losing as much as giving the game away," lamented Kay, with a bitter-sweet memory of being 17-7 ahead of Southern Utah, four minutes into the fourth quarter. The SUUS Thunderbirds came roaring back and at quarter, Kay hit Mark Holland for a 31 yard touchdown pass for the winning TD. Motlica topped it off with another good kick.

CSC Sports Update

Early in the fourth quarter, Mologne hauled a kick between the cross bars on a 23 yard kick for Mines' final three points and a 17-7 lead.

With a 27-19 loss to the University of Southern Colorado, the Orediggers of Colorado School of Mines are going "back to fundamentals," says Coach Kay.

They have to, in a series of three games this season, the Orediggers have lost five of their most experienced running backs—and the latest being Scott Brown with a shoulder separation. The other banged-up backs include Robin Benthon, Alan Gray, Brian Savage and Mitch Knapton. With a week off from competition, Brown and Kipson may be back by October 11, when Mines hosts the Mesa College Mavericks.

"Actually, the game was a lot closer than the statistics reveal," noted Kay. "We were first and goal in ten yards left in the game. A touchdown and a two point conversion would have tied it all up." Sadly, the Orediggers lost the ball at the eight yard line.

Injuries have plagued the Orediggers throughout the season. Each game has meant more injuries—usually to the other team doesn't expect it, often in midair," said Kay.

On Tuesday, September 16, the Orediggers played against Colorado College and Colorado Women's College.

Mines lost against both teams and made four or five phenominous saves," said CSM Coach Bob Pearson.

CSM managed to score twice in the first half. First, it was Bob Woods on an assist from Tom Hathaway, then vice versa. "Overall, I felt good about the game. We were aggressive all through the game—we didn't slow down, so our conditioning is beginning to pay off," said Pearson.

The Oredigger soccer team continued to have a tough time as they lost to Denver University 3-1, were shutout by Wyoming 2-0 and fell to the Brigham Young University Cats 2-2.

"I thought we played very well against both DU and BYU. Both were tough, good games. Against BYU, a 2-2 game against CU, all I can say is that we couldn't adjust to the Astro-turf—I ball moved much faster, harder and higher than anything we've ever known. We didn't make a single goal attempt in the first half, and only two shots in the second," said Oredigger Coach Bob Pearson.

"I do feel that we've been improving with each game. We get another shot at DU soon," said Pearson.

Soccer

The CSC soccer team was edged 5-2 by Wyoming University September 20 at Brooks Field, here in Golden. "We dominated the first half, but Wyoming had a tough goalie who got hot in the second half and made four or five phenominous saves," said CSM Coach Bob Pearson.

The CSM soccer team was edged 3-2 against the University of Southern Colorado, the Orediggers of Southern Colorado, the Orediggers of...
Back To The Scene Of The Crime

Don't worry Mom, he's eating right.

You forgot the window?

Don't worry Mom, he's eating right.

The mines magazine • november 1980

40

You forgot the window?

Don't worry Mom, he's eating right.

You forgot the window?

Don't worry Mom, he's eating right.

The mines magazine • november 1980

41

Back To The Scene Of The Crime

Don't worry Mom, he's eating right.

You forgot the window?

Don't worry Mom, he's eating right.

The mines magazine • november 1980

40

You forgot the window?

Don't worry Mom, he's eating right.

You forgot the window?

Don't worry Mom, he's eating right.

The mines magazine • november 1980

41
Dear Ms. Petty,

The letter you have just written has been said and written about the Trustee's Keystone Conference, held last July 10-13. This conference is an annual event where the Trustees, Administration, and guests reflect upon a theme pertinent to the School. A Great dome, planning, thought, and study takes place in the peaceful setting and many a thought bears fruit later in the year.

This year's conference was a very unique gathering. In addition to those normally in attendance, a group of students were invited to participate. It was hoped that a broad spectrum of student opinion was heard. The students on the Executive Committee solicited comments and responses from their peers regarding what should be administered at Keystone in the final analysis, a reassessment of student responsibilities was achieved.

The main purpose of the Conference was to paint an accurate picture of student life. First the students simply tried to give the Trustees a feel for what it is like to attend Mines in 1980. As a follow-up, some areas of student life were discussed in detail. The positive aspects of Mines were addressed, as well as those areas needing improvement. The results of the three day conference will be summarized in a follow-up report.

The format of the conference was such that no one person, or group of people, spoke for the Mines students, and how to best address those problems. The end results of the three day conference were overwhelmingly positive. A candid, honest atmosphere, coupled with thoughtful discussion, allowed everyone to gain a better insight into the student/teacher relationship, and to have a better understanding of student life, and how to best address those problems.

The發現 was that faculty advisor systems presently used, it is felt a more thoughtful, comprehensive, constructive evaluation would be manifested through this system. Several students are currently exploring alternative methods of teacher evaluations.

The problem this often results from a lack of communication between faculty and students, in that students, are unaware of which assignments they are allowed to collaborate on, and which they are not. And, so mentioned above, spiking is sometimes the only way to get an assignment turned in.

2. Advising

Professionals differ in the quality of the faculty advising services from school to school. Many have a personal interest in the student to those who feel their responsibilities lie solely in signing registration forms. Some students said that they received little help in the faculty advising, and more direction given to the professors as to where their responsibilities lie.

One problem is the often in the reluctance on the part of the faculty, which needs to be done, is that most professors are not as knowledgeable about the course work on the part of the student, or which to take. It is realized that faculty advisors are not always the best, but rather are there to help students plan their course schedules.

3. Counseling

Strong support was given to the creation of a counseling office at CSM, as well as the development of peer counseling. Students have a clear need for an outlet when stress becomes overwhelming. This office is a large step to fulfilling that need.

4. Financial Aid

With the increase in tuition, a great deal of discussion centered around availability of financial aid. It was noted that few students did not expect a student loan to be an added burden, but did think that the aid should be more effective. The majority of students simply do not have the money for tuition. A few financial aid proposals were presented, which would allow private funds to Mines and make them available.

5. Housing

Housing requirements of students were being reviewed in the face of deficiencies in reasonable off-campus housing and a great increase in housing costs, which make it difficult for some students whose homes are not within commuting distance.

6. International Students

Problems of international students attending Mines were addressed, along with the understanding that international students have a lot to offer. International students make great work overall. The International students are students who attended Mines were addressed, along with the understanding that international students have a lot to offer. International students are students who attended Mines were addressed, along with the understanding that international students have a lot to offer.

7. Nutrition

A discussion was held on the matter of nutrition. Little can be done to prevent spiking as it involves a personal choice made by the student.

8. Final Report

It is felt that the CSM Alumni should be careful to concentrate on the course work, which is the essence of all of the above. The Alumni who attended Keystone are encouraged to write to the student and provide the International students with unique and valuable additions to the text.

Many other subjects were discussed over the course of the conference, including professional integrity and the role of human resources in the work environment.

All participants at Keystone left the conference with a greater satisfaction and sense of real accomplishment. All felt they had helped Mines make significant progress. What remains to be done is a follow-up on the ideas presented at the conference. Many students were encouraged, and the school greatly improved, by decisive actions of the students, faculty, and administration.

Paul Gourt Student Body

JOHN D. VINCENT, '33
METALLURGICAL CONSULTANT
ENVIROLOGIC SYSTEMS INC.
4880 East 16th Street, Denver, Colorado 80220
Phone: (303) 339-0977

E-mail: jdv@gusnix.ensites.com

Guy T. McBride, Jr., President

The mine's magazine • November 1980

Dear Ms. Petty,

I have just read your letter which you have just written about the Trustee's Keystone Conference, held last July 10-13. This conference is an annual event where the Trustees, Administration, and guests reflect upon a theme pertinent to the School. A Great dome, planning, thought, and study takes place in the peaceful setting and many a thought bears fruit later in the year.

This year's conference was a very unique gathering. In addition to those normally in attendance, a group of students were invited to participate. It was hoped that a broad spectrum of student opinion was heard. The students on the Executive Committee solicited comments and responses from their peers regarding what should be administered at Keystone in the final analysis, a reassessment of student responsibilities was achieved.

The main purpose of the Conference was to paint an accurate picture of student life. First the students simply tried to give the Trustees a feel for what it is like to attend Mines in 1980. As a follow-up, some areas of student life were discussed in detail. The positive aspects of Mines were addressed, as well as those areas needing improvement.

The format of the conference was such that no one person, or group of people, spoke for the Mines students, and how to best address those problems. The end results of the three day conference were overwhelmingly positive. A candid, honest atmosphere, coupled with thoughtful discussion, allowed everyone to gain a better insight into the student/teacher relationship, and to have a better understanding of student life, and how to best address those problems.

The problem this often results from a lack of communication between faculty and students, in that students, are unaware of which assignments they are allowed to collaborate on, and which they are not. And, so mentioned above, spiking is sometimes the only way to get an assignment turned in.

2. Advising

Professionals differ in the quality of the faculty advising services from school to school. Many have a personal interest in the student to those who feel their responsibilities lie solely in signing registration forms. Some students said that they received little help in the faculty advising, and more direction given to the professors as to where their responsibilities lie.

One problem is the often in the reluctance on the part of the faculty, which needs to be done, is that most professors are not as knowledgeable about the course work on the part of the student, or which to take. It is realized that faculty advisors are not always the best, but rather are there to help students plan their course schedules.

3. Counseling

Strong support was given to the creation of a counseling office at CSM, as well as the development of peer counseling. Students have a clear need for an outlet when stress becomes overwhelming. This office is a large step to fulfilling that need.

4. Financial Aid

With the increase in tuition, a great deal of discussion centered around availability of financial aid. It was noted that few students did not expect a student loan to be an added burden, but did think that the aid should be more effective. The majority of students simply do not have the money for tuition. A few financial aid proposals were presented, which would allow private funds to Mines and make them available.

5. Housing

Housing requirements of students were being reviewed in the face of deficiencies in reasonable off-campus housing and a great increase in housing costs, which make it difficult for some students whose homes are not within commuting distance.

6. International Students

Problems of international students attending Mines were addressed, along with the understanding that international students have a lot to offer. International students are students whose homes are not within commuting distance.

7. Nutrition

A discussion was held on the matter of nutrition. Little can be done to prevent spiking as it involves a personal choice made by the student.

8. Final Report

It is felt that the CSM Alumni should be careful to concentrate on the course work, which is the essence of all of the above. The Alumni who attended Keystone are encouraged to write to the student and provide the International students with unique and valuable additions to the text.

Many other subjects were discussed over the course of the conference, including professional integrity and the role of human resources in the work environment.

All participants at Keystone left the conference with a greater satisfaction and sense of real accomplishment. All felt they had helped Mines make significant progress. What remains to be done is a follow-up on the ideas presented at the conference. Many students were encouraged, and the school greatly improved, by decisive actions of the students, faculty, and administration.

Paul Gourt
Student Body

JOHN D. VINCENT, '33
METALLURGICAL CONSULTANT
ENVIROLOGIC SYSTEMS INC.
4880 East 16th Street, Denver, Colorado 80220
Phone: (303) 339-0977
E-mail: jdv@gusnix.ensites.com

Guy T. McBride, Jr., President
Good Hands on Good Iron
Team-Up with CRC
When it’s workover, completion, or cased hole... CRC will make it work. Call us for your free consultation.

the mines magazine • November 1980
WHEN YOUR SURVIVAL DEPENDS ON YOUR EQUIPMENT
QUALITY IS NEVER A LUXURY