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Dravo Engineers and Constructors"

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• The largest producer of microelectronic memory products
• The leader in Very Large Scale Integration
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• The leading developer and producer of digital and linear systems
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• TI has key positions in 30 countries on six continents. You'll find manufacturing in Singapore, Delhi, Tokyo, Rio, Buenos Aires, and many other cities around the globe.

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Alumni events calendar

Nov. 4—Cont. Ed. “Maintenance Management for the Mining Industry” Denver. For further information contact K.M. Barbouro, CSMAA, 80401.

Nov. 7—“Stop Smoking Without Willpower,” Denver, CO. For further information contact Mr. R. K. Miller, CSM (303) 279-1120.

Nov. 8—“A Natural Economic Recession” Denver. For further information contact R.W. Davis, CSM (303) 279-1120.

Nov. 13—CSMAA Christmas Social, Houston, TX. Luncheon, No. 1111 31st St. Chicago, IL.

Nov. 14—CSMAA Christmas Social, Atlanta, GA. Luncheon, President’s Club (Sunoco) 2100 Peachtree. Atlanta, GA.

Dec. 3—CSMAA Meeting, Spokane, WA. Breakfast, 1000 E. 2nd Ave.

Dec. 6—AAA-ALMA Christmas Meeting, Tucson, AZ. Luncheon to be announced.


Dec. 10-12—DECEMBER CONVOCATION. Denver, Dec. 12, Green Center, 8 p.m. Program: “OWNER-BUILDER—How to Build Your Own Home” by Prof. Robert T. Reeder of the Mining Department.

Feb. 11, 1981—4th National Western Mining Conference, Denver Downtown Hotel, Denver, CO, sponsored by the Colorado Mining Alum, 1515 Cleveland Pk., P.O. Box 733, Denver, CO 80201. (303) 374-8165.

Feb. 13—CSMAA Convocation, Denver, CO. Luncheon, Denver Athletic Club, 11:30 a.m.

Feb. 14—FORMER’S FAY BANQUET. Dinner for everyone.

Feb. 28—Mar. 2—AMC Convention, Dallas, TX. Lectures, Seminars, Field Trips.

May 7-11—1981 COMMENCEMENT. Residence Halls are 1928, 1933, 1938, 1941, 1946, 1st & 4th. Breakfast May 8, Green Center, 8:00 a.m. Graduation Exercises May 9.

5. Records—With over 9,000 living alumni and 7,000 known addresses of those graduates, we have an Association of over 4,000 active members. Each member receives 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.

6. If your address is wrong or unlisted in this directory, it is probably due to your own fault. Your Alumni Association needs your help.

7. Didn’t advise us of a change.

8. Never joined the Alumni Association, and are possibly one of the 2,000 lost, or.

9. 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 my 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, introduced me to the group. I was flattered with the cordiality of the reactions to the presentation of the keynote address that I briefly reviewed the student-faculty-administrative discussion of the Keystone Conference reported to us in our September issue of the magazine, and told the student the concern and needs resulting from increased costs of parking in an excellent mining engineering education.

Prof. Robert T. Reader 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 both of 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 published as an addendum to this issue of the MINES Magazine. Please give the Alumni department this help!

The Opening Session of the 1980 AMC 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 the over-regulated mining industry and directly connected the consequences to the economy and defense posture of our country.

I have copies of these presentations and intend to read them, 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 degree-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 majoring in the field. The purpose of these courses is to broaden the basis of the student for managerial and economic evaluation responsibilities.

Program

The Mineral Economics Department was initially set up to grant only the Master's degree. In response to industrial demand for greater depth of education in the mineral economics field, the Department was authorized to grant the Doctor of Philosophy degree in 1974.

As of June, 1980, one hundred and ten Master's degrees and thirty-three Ph.D. degrees have been granted. There has always been a uniform requirement that the degree be relevant to real mineral and energy problems in the private and public sectors.

In the early years of the Department, there was considerably more emphasis on the second objective defined by the Board, that of feasibility studies for mineral and energy project development. This emphasis was exemplified by the establishment of the Coulter Foundation Professorship in Mineral Economics in 1968. This chair is still occupied by the original recipient, Alfred Petrick.

As time progressed, there was a considerable increase in industrial demand for mineral engineers who had acquired the skills to move rapidly onto the fast track of corporate operations and production management. Anticipating these needs, the Department incorporated faculty qualified to offer the desired emphasis on the first objective of the Board, the education of mineral engineers in economic analysis and management.

The managerial training within the Department is run on the "gulf" system; students share office space with the professor and are expected to work on real mineral and energy-related projects for national and international companies. The students, rather than the professor, are responsible and thus paid for the consulting work done. It is the duty of the professor to seek such projects for the students and certify and guarantee the quality control of the results. All theses and dissertations completed by the students in this program must meet the following standards:

1. work must involve a real problem proposed by a participating company;
2. results of the work must be implemented by the company; and
3. the student must prove that the work has resulted in a verifiable cost reduction or profit increase to the company, according to generally accepted accounting and/or auditing principles.

The Department faculty contends that the above requirements have a proven positive effect on the student's understanding of business and corporate reality.

There are basically two types of projects in this program; those done by a single student and those done by a group of students. Typical of a single student project would be the management audit of the U.S. Steel plant at Doll City, Pennsylvania by Dr. Patrick Allen (now a First Lieutenant in the U.S. Army Corps of Engineers) in his first semester in the program. As a result of his brief study, the Department received a letter of commendation from the vice president of manufacturing, Mr. John P. Higley. Typical of the projects done by groups of students is a study for a mineral subsidiary of a multinational corporation. A total of $200,000,000 investment in a pipeline should be made. This study was requested by the company last April and was completed by six students and the supervising professor in time for delivery to corporate headquarters in ten days, as was required. The most recent group project involved a study to be again delivered in ten days, for a multi-national corporation and concerned the feasibility of acquiring a mineral subsidiary with assets exceeding 1.6 billion dollars. The study was completed and delivered ahead of schedule by three students and the supervising professor.

The real benefit of projects such as these is that the students have access to actual industry problems and solutions while they are still in school, and obvious plus on their resumes.

As a final note, the Department Head has initiated an innovative plan for all his students. Any student who can save $1 million for his employer in one year on one project by either reducing costs or increasing profit (according to gener-
Gardner-Denver

Fall Semester
511 Intermediate Underground Drilling (Microengineering)
ME Applied Mechanics
SS Linear Programming and Network Analysis
Spring Semester
510 Natural Resources Management
ME Engineering Economics
504 Economics
590 Forecasting

After completion of the common core, students select course work according to their interest, in consultation with their advisor, committee members, and the Graduate School to complete the appropriate degree. Familiarity with technical aspects of the mineral and energy industries is assumed. The students are expected to focus their attention on a specific area of mineral and/or energy engineering for their research.

Academic Goals

The goal of the degree program in the Department of Mineral Economics is to graduate students qualified in each of the five major fields of study.

(1) Economic analysis and policy
(2) Feasibility studies and financial assessments,
(3) Operations and quantitative management methods,
(4) Accounting, verification, and manipulation,
(5) Communication

The fifth requirement is present because the student must realize that all of the knowledge of the first four areas is useless unless it is communicated in an understandable and concise format. The result is a large cumulative and increasing volume of data that must be summarized to provide useful information. Since the student's career is a function of the quality of his presentation, the graduate program is designed to provide students with a sound education in the language of engineering and economics.

What Are the Students Getting?

Programs in an academic institution usually start with very loosely defined requirements and slowly evolve in response to changes in demand. The emphasis of the Mineral Economics program is on performance and practical results. Students are expected to be self-directed and capable of being exposed to diverse economic and non-economic elements under study. To be effective, definitions and direction must be clear and timely. The departmental personnel are responsible for the establishment of a departmental plan and performance measurement. The results of this retreat was a complete reorganization of the graduate program. There is now a core common required of all students in the program. This is a procedure which is necessary to provide solutions that will ensure the American society.

The Energy Field Institute

The Energy Field Institute is an educational activity sponsored by the Colorado School of Mines and the University of Denver. The hall is established a joint-degree program in mineral economics and natural resource laws. Under the cooperative program, selected students simultaneously pursue a Juris Doctor in law and the MSc. or Ph.D. degree in mineral economics. The intent of the program is to educate a group of highly trained lawyers and natural resources management. It will approach their careers with a greater appreciation of multidisciplinary issues, methods, and perspectives.

Sponsored Programs and Research

The Mineral Economics Department is currently focused on three major areas. These areas are the macroeconomics of regional resource development, public policy and natural resource laws, and market development for appropriate technology. The department sponsors field trips and research to provide financial support for nine graduate students, three research faculty, one secretary, and summer funding for several of the academic faculty. During this year, the program provided most of the funds used for capital improvements and equipment in the Department. The value of sponsored programs and research projects is so significant that we are doing something right.

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the Department of Mineral Economics has taken a leading role in researching 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 significant contributions to our understanding of this field.

The focus subject matter includes regional resource development, internships, and policy research. The joint CSM-CSU team has produced the major driving force behind the need for interindustry models for the minerals industry. The Phillip Brothers Professorship was established to attract a professor of international stature in the micro aspects of minerals and energy economics. The John M. Olin Foundation visiting professorship was established to attract to the campus one of the leading free-market economists to ensure that our graduates are exposed to a broader and more comprehensive understanding of economic principles.

In the pursuit of this goal, and through a cooperative effort between the Department of Mineral Economics, the 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 Cost Company, the Public Service Company of Colorado, the Hewlett Foundation, Rocky Mountain Energy Company, W. R. Grace and Company, and The Phillip Foundation. Each graduate student intern per year is sponsored by the Energy Field 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 Resource Research Institute (MMRRI-P.R. 86-87) 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-P.R. Program and Resources has also served in an interdisciplinary mode to provide expertise for other research programs at the Colorado School of Mines, the University of Colorado, and the University of Colorado, Department of Agriculture. The members of the Department of Mineral Economics academic faculty who have been involved in contract research this past year include Drs. Ruth Maurer, Oded Rudensky, and Joseph Weber. The research faculty members are Drs. Ray C. Ericson and Janice C. Hepworth, and Mr. James Ogard.

Where Are We Going and Where 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 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 privately-funded professorships show that the private sector is willing to meet the challenge of assisting the Colorado School of Mines in becoming increasingly allied with the private sector. The economic philosophy of the Department could be summed up in the following statement: "Free enterprise and competition are not philosophies to be defended, but gospel to be spread."

Dr. R. E. D. Woolsey
Dr. Joseph Weber
Dr. Frank Stirmoite
Dr. W. John Cieslewitz
Dr. John Cordes
Dr. Anshumali Gangwar

Dr. Oded Rudensky
Dr. Alfred Patrick
Dr. W. John Cieslewitz
Dr. Janice Hepworth

Dr. Ruth Maurer
Dr. Lynd Gillam
Dr. Anshumali Gangwar

The funded professorships established are:

1. The MAPCO Foundation Professorship,
2. The Phillip Brothers Professorship (sponsored by Engelhard Minerals and Chemical Corporation), and

Each of the above professorships was established to meet a very different need in the Department. The MAPCO professorship was established to attract a world-class operations and production management professor to work in the areas of quantitative methods for the minerals industry. The Phillip Brothers professorship was established to attract a professor of international stature in the micro aspects of minerals and energy economics. The John M. Olin Visiting professorship was established to attract to the campus one of the leading free-market economists to ensure that our graduates are exposed to a broader and more comprehensive understanding of economic principles.

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In the 1960's we saw a country growing economically, growing industrially, and concerned about environmental quality. As moved from the Idaho Legislature to the United States House of Representatives, in 1967, my vision of those 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 continued 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 an attempt to reach a goal. While there may be a difference of opinion in the need to attain a goal, there are few who would not support protection of the environment.


In the national interest, to foster economic and industrial development, must be implemented. Implementation requires coordination of another. On a broader scale, it reminds me of a letter I got from one administrative agency, it's so loud it violates 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 crassly optimistic politician in Idaho who summed it up best. "The government is so big it's falling all over itself."

The Constitution protects us from a dictatorship by the President or the military, but even the genius of our forefathers didn't foresee dictatorship by limbless and faceless regulations. We can't impeach "him," because the regulations are "them." This is regulations. The demands, the orders govern us all, no matter what the number, it is too much.

The National Materials and Minerals Policy Act, 1980 passed the House and was favorably reported by the Senate Energy Committee. Should it pass into law with the changes made by the Energy Committee, 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 the non-fuel mineral and materials cycle, from exploration to final use. This is a beginning, a first step warri
The mine was closed because of an imminent danger. In a letter, MSHA persisted in its view that the mine developed a new mining operation, which was prohibited. MSHA cited as imminent danger the fact that the mine had not taken the necessary steps to ensure the safety of its workers. MSHA allowed the mine to reopen after six months, but the mine was still under regulatory scrutiny.

In 1977, I introduced a bill to the Senate to regulate stockpile material on the country's needs and dependencies. Many Senators supported me, and an unsure national security. Our problems do not have an Administration which is able to take a real crisis before the public pays attention. The Congress and the Administration have tried to make two points: First, that the oil price was going to jump to five dollars a barrel, and second, that the United States would begin paying a political price for oil. Those oil executives were amused and disbelieving.

The price of oil jumped way above five dollars a barrel, and the gas lines appeared. Americans were being held prisoners because of the oil crisis. Oil prices have more than doubled since 1973, and the oil crisis is still with us today.

The energy crisis is more than just land withdrawals. The government has made it easier to rely on foreign sources than to develop our own. The strategic and critical materials that the United States produces in insufficient quantities, but still with some import dependence would have a reserve equal to 3 years of net imports. Materials which the United States produces in insufficient quantities would have a reserve equal to 2 years, materials which are produced have in substantial quantities, but still with some import dependence would have a reserve of one year.

The bill never passed and two years later, the Stockpile Act was amended with an overall 3 year supply, which the President deemed sufficient for a war or other emergency.

I recall speaking to oil company executives back in early 1972—before any body was really thinking about energy. I tried to make two points: First, that the oil price was going to jump to five, even ten dollars a barrel, and second, that the United States would begin paying a political price for oil. Those oil executives were amused and disbelieving.

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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 adverse environment thus:

At the May 15th meeting of the Investment Company Institute, Robert J. Boyd of London-based investment advisors, GT Management Ltd., was negative on investments in the U.S. stating, according to the Washington Post:

"The principal reason boils down to..."

<table>
<thead>
<tr>
<th>The Deteriorating U.S. Economy</th>
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<tbody>
<tr>
<td>(1) Federal Spending as % of GNP (Average %)</td>
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<tr>
<td>(2) Real GNP</td>
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<tr>
<td>(3) Unemployment Rate (Average %)</td>
</tr>
<tr>
<td>(4) Real Business Investment (Avg. Ann. % Change)</td>
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<tr>
<td>(5) Productivity (Avg. Ann. % Change)</td>
</tr>
<tr>
<td>(6) Inflation (Avg. Ann. % Change)</td>
</tr>
<tr>
<td>(7) Federal Deficit (Average, $ billions)</td>
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</table>

"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, and service. We subsidize non-work, welfare and consumption.

With the Windfall Profits Tax we are going to have a lot less domestically produced coal 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 1966 to a 3.4% rate for the six years ending 1973 and, now, to only 2.5% for the six years ending 1979, a deterioration of (46.8)% from 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.

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 rates 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 to 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%

33% and 3 times the 11% rate for Germany.

With 5.3% of the world's population the U.S. consumes 15% of gasoline—i.e. we have to say shamefully—3 times its percentage share of world population or 49.3% of the world's total.

The price of gasoline at the pump in the U.S. is only $1.20 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 scarcest forms of energy—oil and gas—in lieu of increased use of coal of which we have almost unlimited supplies.

During the years 1960-71, the price of low sulfur coal was $5.50 MMBTU. Low sulfur coal was only 12.2% higher in cost than low sulfur residual oil.

All these changes in the early 1970's 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 6.3%, respectively, higher than the prices of oil and natural gas. On this basis, and thanks to proudly 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.

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 CAPCO 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 Congressional Budget Office has identified duplications in the Food Stamp and School Lunch programs which, if eliminated, could save $1.5 billion per year. These two items are simply examples of possibilities for savings on transfer payments that would not be acceptable to the people in no way, defeat the intent of the programs. By comparing the individual dependent persistent on private employment have fallen from 71.5% of all income earners in 1950 to only 36.5% in 1980. This is based on recent Congressional estimate. In effect, this is a measure of the problem of the ever expanding government that has to be dealt with carefully if we are to reverse the decline in the U.S. economy.

**Income Taxes**

Prime consideration should be given to reducing the tax burden of individuals. If the maximum tax rate on incremental income were reduced to 36% from the present 70%, this would still cost only 4.9% of the total revenue and the income base would have to increase by only 3.1% to make up for the loss.

It is based on tax returns for 1976—the latest available figures. Thaks of the stimulus of cutting the maximum tax in half.

With the threat of an extremely negative effect on savings, the likelihood of investment and economic growth. While the tax rate fell on average from 26.6% during the years 1963-1965 to 24.8% in the years 1964-1975, the average savings rate in the U.S. economy increased from 5.1% to 6.9%.

Other evidence suggests that increasing the level of income by $25,000 per annum, in constant 1979 dollars, would provide a tax cut to the taxpayer of $300. By definition, this is based on tax returns for 1976. It also means that this is a program which is being expanded far beyond its original concept— at the cost to the taxpayer—and hence it is symptomatic of what happens to federal programs once they are established and perpetuated.

The Congressional Budget Office has estimated that if we limit Social Security indexing to the change in the Gross National Product, the government's report increase in the cost of living, $40 billion could be saved in the next 5 years. Since people receiving Social Security benefits are in the main not subject to some of the major increases in the cost of living, such as the increasing cost of purchasing a new home, the Congressional Budget Office has not hesitated to identify this as a potential source of saving.

The Congressional Budget Office also calculated that if Social Security payments were continued to be indexed at 100% but with a correct measurement of increases on the cost of living for retired individuals, $30 billion could be saved by 1985.

**Federal Government Borrowing**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Credit Markets Borrowing</th>
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<tbody>
<tr>
<td>1950-54</td>
<td>$1,236,500</td>
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<tr>
<td>1955-59</td>
<td>$2,472,100</td>
</tr>
<tr>
<td>1960-64</td>
<td>$4,948,200</td>
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<tr>
<td>1965-69</td>
<td>$9,896,400</td>
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<tr>
<td>1970-74</td>
<td>$19,328,800</td>
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<tr>
<td>1975-79</td>
<td>$32,657,000</td>
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</tbody>
</table>

Federal Government borrowing has grown to 23% in the latest 5-year period.

**Food Stamp Program**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Millions of Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>$0.8</td>
</tr>
<tr>
<td>1965</td>
<td>$2.7</td>
</tr>
<tr>
<td>1970</td>
<td>$57.0</td>
</tr>
<tr>
<td>1975</td>
<td>$419.4</td>
</tr>
<tr>
<td>1980</td>
<td>$6,349.7</td>
</tr>
</tbody>
</table>

Latest Congressional estimate is that the food stamp program will cost $2 billion in 1980—equal to the entire Federal budget in 1950.

**Pretax Income Required For A Family of Four To Maintain 1972 Real Purchasing Power**

<table>
<thead>
<tr>
<th>Year</th>
<th>Pretax Income Required For A Family Of Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>$1,200</td>
</tr>
<tr>
<td>1973</td>
<td>$1,260</td>
</tr>
<tr>
<td>1974</td>
<td>$1,320</td>
</tr>
<tr>
<td>1975</td>
<td>$1,380</td>
</tr>
<tr>
<td>1976</td>
<td>$1,440</td>
</tr>
</tbody>
</table>

**World Series**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of 30-Second Commercials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>$6,000</td>
</tr>
<tr>
<td>1980</td>
<td>$14,000</td>
</tr>
</tbody>
</table>

We're An Institution Too!

Recognized as an institution in our field, GeoData continues to provide the talent and data involved in petroleum and mineral deposit discoveries. GeoData represents over 1500 man-years of knowledge, experience and skill in our field. GeoData continues to provide services to our clients in the areas of petroleum exploration, production, and service in the petroleum exploration industry on a world-wide basis.

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middle-income workers earning between $20,000 and $40,000 a year. These are the people who make the economy go—the young professionals, people working on commission, and even millions of people doing $20,000 to $40,000 a year. In net, 1% of the citizens pay only 8% of the taxes. In net, 1% of the citizens pay proportionately 153 times as much as 53% of the citizens. This makes it very tough to bring about much needed tax reform, particularly to encourage business investment.

Netting out all the problems that have been portrayed in the preceding, following are five actions that could dramatically reverse the declining strength of the U.S. economy, benefit all who are willing to work and provide the means of helping the disadvantaged.

Comparison of Media and Oil Company Profits

<table>
<thead>
<tr>
<th>Region</th>
<th>Oil Company</th>
<th>Media Company</th>
<th>% Return on Total Capital</th>
<th>12 Months Ending Sept. 1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Dow Jones</td>
<td>Media Company</td>
<td>29.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Times Mirror</td>
<td>Media Company</td>
<td>22.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Time, Inc.</td>
<td>Media Company</td>
<td>22.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Washington Post</td>
<td>Media Company</td>
<td>21.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) American Broadcasting</td>
<td>Media Company</td>
<td>20.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) McGraw Hill</td>
<td>Media Company</td>
<td>19.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) CBS</td>
<td>Media Company</td>
<td>18.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) Standard of California</td>
<td>Oil Company</td>
<td>15.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) Exxon</td>
<td>Oil Company</td>
<td>14.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) Mobil</td>
<td>Oil Company</td>
<td>14.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11) Standard of Indiana</td>
<td>Oil Company</td>
<td>13.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12) New York Times</td>
<td>Media Company</td>
<td>12.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13) Gannett Richmond</td>
<td>Oil Company</td>
<td>12.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14) RCA</td>
<td>Oil Company</td>
<td>12.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15) Shell</td>
<td>Oil Company</td>
<td>12.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16) Union Oil Company</td>
<td>Oil Company</td>
<td>11.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17) Continental</td>
<td>Oil Company</td>
<td>11.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18) Texaco</td>
<td>Oil Company</td>
<td>11.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Returns

<table>
<thead>
<tr>
<th>(10) 10 Oil Companies</th>
<th>(8) Oil Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.0%</td>
<td>13.3%</td>
</tr>
</tbody>
</table>
"Challenging the young people at Mines toward excellence

"It has always been an integral part of the Mines scene," Marv Kay, head football coach for the Colorado School of Mines, was referring specifically to football with that statement, but he might have been referring to the entire Mines athletic program.

In one form or another, sports have always been a part of the Mines scene. Competition in sports began almost simultaneously with the school's founding in 1851, as seen in a photograph of Jarvis Hall taken in 1868 and now on display in the Mines library. Close inspection reveals a cricket game in progress on the lawn.

"We are very fortunate," muses Joe Davies, a 33-year veteran of coaching at Mines who retires this year, "that the administration has done a good job of supporting their efforts. More important and they support us and our programs. The Board of Trustees does not want to see severe cutbacks in the program because of inflation." According to the "History of the Colorado School of Mines" written by Mary Hoyt, the first formal recognition of athletics by the Board of Trustees came in 1882. They voted an appropriation of $50 to equip a gymnasium in the base-.

Football was played at Mines in 1883 and one of the toughest engineering schools in the country, is not in attendance for either faculty or students.

"There's always a challenge," comments Pat Dyer, head trainer, comments that "Academics have first priority. One student athlete is rare. They also agree that the student athlete at Mines is just a student first who also happens to participate in sports.

"Mines still requires four separate semesters of physical education to graduate. One day and age when most sports 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. Informal lunch hour basketball sessions are always popular. And if one looks up at the mountains above, one can see a cross country race in progress.

The 12 intercollegiate programs offered today are football, basketball, track, cross country, baseball, wrestling, swimming, soccer, tennis, golf, skiing, and rifle. Those 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 excels that offered by the majority of small and medium sized liberal arts colleges and universities.

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 excels that offered by the majority of small and medium sized liberal arts colleges and universities.

Mines makes the most of the financial resources at its disposal. "We try to be competitive, but we are not always successful," comments Jack Hancock, tennis and wrestling coach for 26 years. "At times there is a lack of support. We understand that. People are just naturally interested in a winner."

Other coaches are dedicated to making the Mines athletic program last and rewarding to both faculty and students. "Win or lose, the Mines coaches agree that the administration has done a good job of supporting their efforts. More money and better attendance at the games would help, though.

"We have the same problems," continued Hancock, "as every business in a time of inflation and recession."

Instead of cutting out whole programs, Mines business manager Bob Pearson has followed a policy of cutting back games. Financial support comes from the state, student fees, and alumni. Many alumni buy season tickets but give them away to local residents to use, thus ensuring better game attendance.

Money and win/loss records are not the only things affecting the Oredigger team. Scheduling has become increasingly difficult as enrollment increases. "Student participation and attendance is not as good as it could be," believes Dick Stapp, coach for track and assistant in football, "because of the increase in night classes and labs. There is also more of a commuter population among students than in years past."

All the coaches are dedicated to making the Mines athletic program last and rewarding to both faculty and students. "Gail Klock is satisfied as long as the students improve and are interested."

Bob Pearson really believes it is "not whether you win or lose but just how you play the game."

Gail Klock cites statistics that only a small percentage of men and fewer women move from intercollegiate athletics into the pros; however, the Mines students will develop skills to their engineering careers. Joe Davies feels companies are looking for well-rounded students and, along with an engineering degree, that
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An in depth look at the Mines athletic program points to at least partial completion of that mission.

When a program means the difference between success or failure as an engineer or manager, it becomes more than just a job. When there's a crisis at hand, a good engineer will race to meet it. The best engineers will turn it into expanding opportunities.

A new program which the CSM Alumni Association is spearheading through The Resource Fund is designed to meet just such a problem: to provide much-needed financial assistance to students even as the times are at work 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's needs for mineral and 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 raising the needed funds for the year 1980-1981. This is the Annual Student Assistance Program (ASAP) of The Resource Fund. The old and successful Annual Alumni Development Program (AADP) has been surpassed by this new and hopefully even more successful program.

ASAP is part of the Resource Fund, which has been described as "the boldest, most imaginative venture ever launched by the School in its long history." The Resource Fund's purpose is to provide the background of financial support to maintain and improve the School's educational excellence, and to have raised over $25 million through corporations, foundations and individuals into its formation in 1977 to strengthen School programs.

If success follows success, the solutions to the energy and mineral crises that are in fact here. We'll be needing your assistance with ASAP to get the job done.

What do we want to do with this money?

We've already mentioned the student cost crunch. We'll like to provide a student loan and grant service to enable deserving and hard-working students to continue their studies at CSM. If we can establish a successful program over a perhaps a 10-year period, with careful administration, the program will become self-supporting and revolving.

We'll be asking you and other graduates to make a multi-year commitment to The Resource Fund through ASAP. Your commitment is really an investment, both in the future of our mutually shared endeavors in resource development and in the strength of your degree from Mines.

Alumni Association volunteers will be in touch with Section leadership in every area, with details and invite each alumnus 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.

Your commitment is really an investment in the great program that has been authorized and started by an Alumni Association volunteer, please think back to what your degree from Mines means to you toward your personal success and well-being. The annual Alumni Development Program is the key to a rewarding future having met the rigorous of a 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 with your share of success and commitment. With the nation, we'll all share in its success.
The Denver Federal District Court Judge, however, flatly disallowed. "Ten years had passed since the discovery."

A reporter asked Harrington why he did it. He replied: "Most people enter into any enterprise with a desire for independence. I had no desires for my family. What right-thinking man does?"

"22 George R. Brown, E.M., and Hon. Dr. Engineering '62, has been elected an honorary director of Texgulf Inc. Mr. Brown served as an active director of Tog from 1952 to 1967. Together with his brother Herman, George Brown was a founder of the world's largest construction company of Brown & Root, Inc. Formerly chairman and chief executive officer of Texgulf and the Denver Federal District Court, he was president and general manager of the Colorado Mining Company in Denver.

"38 Al Nesbitt, E.M., retired Col., U.S. Army, recently sold his portion of the Seattle Times and Shreiner, the Pacific Northwest Airline Inaugural flight, August, 1980. In spite of all of the problems of the mining industry in the Pocatello area of Washington, one returned to a Washington engineer who believes those wanting to learn a trade must do so "on the job" because "higher academic standards are not "sufficiently practical" to teach the technological"

"53 George W. Mitchell, E.M., has resigned as President of the Black Gold Assocation. He has joined Fugro Rocky Mountains, Inc. in Golden, as their director of marketing. Phineas Towns, P.E., has been appointed manager of Environmental U.S. Inc. in Houston. He was formerly that company's executive vice president.

"54 Robert Kendrick, E.M., has been promoted to president of his company, is now president of that company in California.

"61 Reginald Worley, BSc.Min., is currently General Counsel, Equipment Sales & Service Co., Ltd. in Calgary. He has been in charge of that division in California and located in Casper, Wyoming.

"67 Patrick A. Ley, BSc.Math, formerly a computer application engineer for Denver & Moore, is now technical representative for Boeing Computer Service. Thomas M. Deputy, M.S. Econ., has been promoted to Lieutenant Governor, U.S. Army and is based in the Pentagon. William J. Davenport, BSc.Civil, is presently employed by Anchor- Peace Construction as a route technician in FG, South Pacific. Goodyear and M.S. Geol., "is currently self-employed as a consulting geologist in Computer Applications in Exploration Geology in Golden.

"75 Thomas L. Brennan, BSc.Civil, formerly of Climax Molybdenum Company in Colorado, has joined the Mount Emory Project as an associate geologist for AMAX Inc.

"80 Charles Barbour, BSc.Phys., is attending graduate school at Harvard University, Ithaca, N.Y. He has received a research grant from Cornell.

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President—one year term
THOMAS M. SMAGALA, BSc.Geop. 1974, is Manager, Geology-Geophysics, 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. Smagala has served as Secretary, Treasurer and is completing a term as Vice President for the Alumni Association.

Vice President—one year term
RICHARD A. DANIELE, Met.E. 1960, is Manager, Non-Ferrous Pyrometallurgy Processes with Devo Corp. in Denver. Daniele has been located in Denver since 1973 when he was transferred here from Pittsburgh to set up the Denver office. Prior to that, he was a Metallurgist with Kennecott Copper. He has been a consistent member of the Association since graduation, has served as Secretary of the Alumni Association and is completing a term as Treasurer. He lives in Denver.

CSM Foundation Director—one year term
MARSHALL C. CROUCH, BSc. Geol. E. 1947, is an oil and gas exploration consultant. Prior to that he worked for Plains Exploration, The U.S. Army, Cardinal Petroleum and Kansas-Nebraska Natural Gas Company. He has served on several Alumni Association committees. Crouch served a 3-year term as Director of CSM Alumni Association, 1-year terms as Secretary, Treasurer, Vice President and is completing a term as President.

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 Remenco 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. 1980 is presently vice president of Petrolo Corp. He was formerly with Texaco Petroleum Research Corp., Sifton Companies, H. J. Parker, independent consultant. He is a Certified Petroleum Geologist #2044, AIPG and a Certified Professional Geological Scientist #3639, AIPG. Warren has been a member of the CSMAA for 10 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 mining engineer with ASARCO, Inc. for 41 years. His experience includes: controlled chemist and assayer, assistant superintendent, ore buyer, superintendent and manager. Max retired in 1976. He has served the Alumni Association in Placement Service and is on the Board of Directors of the Mining Association. Coats served in WW II in the Corps of Engineers, U.S. Army at the rank of Lt. Col. He resides in Arvada.

Director—3 year term
ANTHONY F. CORBETTA, Met.E. 1948 went to work for CF&I immediately after graduation and is still with them: presently as a sales representative. He lives in Denver for 2 years, then in Grand Junction until 1960, all the while he returned to Denver. He is Registered Professional Engineer in Colorado and a member of AIME. Corbetta is a past president of the Denver Section, a past chairman of the Alumni Membership Committee and a member of the Association since 1948.
VICKI J. COWART, MSc.Geop. 1977
is an exploration geophysist 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.

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 Mormic Oil and Gas Co. of Corpus Christi, TX. Prior to that he worked for Kansas-Nebraska Natural Gas Co. He has been chairman of the CSMAA Membership Committee and is presently chairman of the Publications Committee. Nydegger received his master's degree while attending CSM part-time and resides in Golden.

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 a member of the Professional Engineers of Colorado. She has been a member of the Association since graduation and resides in Golden.

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. Stew lives in Littleton.

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in memoriam

Alfonso C. Savage

Alfonso C. (Sattisporte) Savage, E.M. 1932, died of cancer on June 7, 1980. While at Mines he was a member of Alpha Tau Omega fraternity. He later worked for New Jersey Zinc Company. He is survived by his wife who resides in Ogden, Utah, New Jersey.

Robert C. Keeney

Robert C. Keeney, BSc-Min. 1976, died July 9, 1980. He was working on his thesis at Mines to obtain a master's degree in Economics at the time of his death.

Born in San Antonio, Texas, in 1953, Keeney's family moved to Colorado Springs in 1965. He graduated from Mines in 1975, having been on the CSM swim team for four years, most valuable swimmer two years, and outstanding senior athlete.

During the summers of his college years he worked for Consolidated Coal Company and AMAX Henderson Mine. Upon graduation he became sales engineer for Ingredel Rand Company in New Jersey. In 1977 he moved to Albuquerque to work for Crown and Co., as a salesman. Between 1979 and 1980 he was miner and section foreman for Snowmass Coal Co. in Cotontdale, Colorado.

Malcolm E. Collier

Malcolm E. Collier, E.M. 1922 and Hon. Main, 1969, died August 28, 1980, at loftman Medical Center in Denver. He was 60 at the time of his death.

A native of Denver and veteran of World War I, Collier graduated from Mines in 1919 and the University of Colorado School of Law in 1925. He was a practicing attorney until 1971. From 1930 until his retirement in 1971, Collier was president of First Federal Savings and served as a director from 1925 to 1979. He was president of the Savings and Loan League of Colorado in 1942 and 1956 and a director of the Federal Home Loan Bank Board.

David H. Singer

David Horace Singer, Ger. 1950, died on January 20, 1980, at the age of 56. Singer was born in Warren, Utah, and attended college in Youngstown, Ohio. He received a degree in chemistry from Western University of Pennsylvania, where he was a staff geologist in their Development Department. He later worked for the Richfield Oil Company's Exploration Department in Tulsa, Oklahoma.

He is survived by his wife, Ellen, who resides in Winter Park, Florida.

Warren H. Yarroll, 34

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Bill Thornev '48 Ex. Bill Thornley '48 Ex.

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31
Uranium Technology

Many people find themselves concerned about the issue of nuclear power and its impact on the environment. What are they assailed by conflicting reports and opinions throughout the media and industry.

The Colorado School of Mines Continuing Education Office has a unique program titled "Uranium Technology." An intensive course examines the aspects of the fuel-cycle—exploration, mining, enrichment and fabrication to fuel use in reactors and on to waste disposal options. The front-end aspects of the fuel-cycle—exploration, mining, and milling and their related environmental aspects—are emphasized.

Now in its third year, this course has been updated to reflect changes in issues, technologies and federal legislation affecting uranium supply and demand.

The course is based on a nonmathematical understanding of nuclear physics and reactors, thus giving an overview to those who wish to gain a broader perspective of industry and public concerns. The course has been structured primarily for non-technical professionals as diverse as attorneys, economists, government officials, and policymakers.

The fee per participant for each 2-day course is $230.00. This charge includes registration, coffee, lunches, a reception, text, and handout material. A 10 percent discount is offered to organizations sending three or more participants. Scholarships are awarded to those completing the course.

Participants receive 1.5 Continuing Education Units upon completion of the course.

The short course was developed and is presented by Dr. Jerome G. Morse, adjunct associate professor of physics at Colorado School of Mines. Dr. Morse is a fellow of the American Nuclear Society and a member of numerous regulatory bodies. He is co-editor-in-chief of the Nuclear Regulatory Commission's newsletter, "The Nuclear Regulatory Reporter" on the school annual staff and a contributing editor of "Nuclear Energy" (1978) and "Energy Re- sources Information Series—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, Division of Continuing Education, Colorado School of Mines, Golden, Colorado 80401. Telephone: (303) 798-0300, ext. 2321.

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

Scholarship Winner

John B. Hird is one of 50 students who received the 1980 Texasgulf Scholarship of $3,000 to aid in covering the educational costs of the college of his or her choice. Hird chose the Colorado School of Mines.

In an administrative move announced last week, the scope and the mission of The Rocky Mountain Center for Development (RCC) of the Colorado School of Mines has been broadened from an external to an internal focus.

"Previously, the thrust of the RCC has been to usualy document concerns of mineral and energy development in Colorado and the west," said President McBride. "Under a contract with the Colorado Legislature, the RCC produced these films in this area.

"When the contract with the Legisla
ture ended, the RCC sought contractual work with various governmental agencies. Most such contracts were of a short-term nature, noted McBride.

According to John Golden, dean of Graduate Studies and Research Development, the Center will now focus attention on "what geographical area could be served, what process should be used to recover the energy, and the cost and return on investment to Golden users and to Coors."

Currently, the waste steam heat at Coors is being condensed into water, at the rate of 175,000 pounds of steam pressure per hour. Technically, notes Dr. Sloan, that's enough energy to supply the needs of 12,000 homes a year, or the Mines campus and 4,000 homes per year. The CSM campus would require approximately 40,000 Btu/hr of steam.

The CSM students are considering a variety of methods to recover the waste heat. Meeting weekly with Sam Baxter, an engineer at Coors, the students hope to finish their feasibility study by the end of this semester. In that study, they will have to answer such questions as: what waste heat could be served; what geographical area could be served; what process should be used to recover the energy, and the cost and return on investment to Golden users and to Coors.

An untapped resource could eventually heat the Colorado School of Mines and 4,000 homes in Golden—the waste industrial process heat from the Adolph Coors Company. The Colorado brewery is scrapped a proposal to recover its waste heat, in an effort to make the Colorado School of Mines and the City of Golden more energy efficient. Three CSM students, Wanda Eston, Donald Hynes and Tom Netzel, enrolled in a chemical petroleum refining engineering design class under the supervision of Dr. Dendy Costner, will conduct this study.

In appreciation of the student study, Coors has presented the chemical and petroleum-refining department with a check for $6,000—an unrestricted grant to be distributed to students in the department to offset this year's tuition increase.

The short course was developed and is presented by Dr. Jerome G. Morse, adjunct associate professor of physics at Colorado School of Mines. Dr. Morse is a fellow of the American Nuclear Society and a member of numerous regulatory bodies. He is co-editor-in-chief of the Nuclear Regulatory Commission's newsletter, "The Nuclear Regulatory Reporter" on the school annual staff and a contributing editor of "Nuclear Energy" (1978) and "Energy Resources Information Series—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, Division of Continuing Education, Colorado School of Mines, Golden, Colorado 80401. Telephone: (303) 798-0300, ext. 2321.

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

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Asarco is a regular buyer of nonferrous ores and concentrates.

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.

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Copper Smelters ............... El Paso, Texas; Hayden Arizona; Tacoma, Washington.

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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, P.O. Box 5747, Tucson, Arizona 85703.

Scholarships
by David Smith-Garbett

Response to the call for increased support for student financial aid at Colorado School of Mines has taken numerous forms since the beginning of 1980, according to E. Russel White, director of The Resource Fund. Increased support has come through endowment funds, increased support for continuing programs, and the commitment of new long-term funding for student financial assistance. Substantial new support is being sought in light of recent tuition increases.

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 put Kaiser Aluminum and Chemical's scholarship fund fellowship program on a "permanent and continuing basis," the endowment 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 1978.

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.

Lilton/Western Geophysical Scholarships: This first-time contribution to the scholarship effort will provide scholarships for the coming year.

White noted that the overall scholarship and fellowship program has grown through the outstanding assistance of a number of volunteer fund-seekers. 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 mines magazine • November 1980
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. Members of the club buy their own jersey, shorts and rugby boots in addition to dues and expenses for travel and lodging for away games. Dues go mainly for the post-game "refreshments" traditionally provided after each home game and the post-season party for the club. Balls, field equipment, and medical supplies are taken care of through school funds.

The club started in the spring of 1967 by Marv Kay (EM '63), present head football coach at Mines, and Ron (EM '69) and Bob (EM '70) Bills. Mines was the first rugby club in Colorado and played the first game in Colorado against the CU club. Mines won 9-3. They also won the other two games, played against CU that spring. Mines was one of the charter members of 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 1968 Mines won the first seven-sides tourney in ERRFU.

The Mines 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.
CSM Sports Update

Football

Merv Kay is not a happy man after losing to Southern Utah, 20-17. "I don't mind losing as much as giving the game away," lamented Kay, who bittersweet memory of being 17-7 ahead of Southern Utah, four minutes into the fourth quarter. The SUSB Thunderbirds came roaring back and took the lead and hit Mark Holland for a 31 yard touchdown pass for the winning TD. Mollica's point kick was blocked, and the T-Birds went up 17-10 with 2:34 left in the game. "Hey, we still have some good things going for us," said Kay. "We were beat by two of the smartest hitters in the conference, and they were both close, good games."

Soccer

The CSM soccer team was edged 3-2 by Wyoming University September 20 at Brooks Field, here in Golden. "We dominated the first half, but Wyoming had a tough week who got lost in the second half and made four or five phenomenal 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 Oregon soccer team continued to have a tough time as they lost to Denver University 3-1, were shutout by Northern Arizona and beat the University of Colorado 1-0 and fell to the Brigham Young University 5-2. "I thought we played very well against both DU and BYU. Both were tough, good games. Our biggest game against CU, all I can say is that we couldn't adjust to the tempo—too many of our players even seemed to be off. We didn't make a single shot on goal all day and only two shots in the second," said Oregon Coach Bob Pearson. "I do feel that we've been improving with each game. We got another shot at DU soon," said Pearson.

SUSC quarterback lost a pass to Southern Colorado, the Orediggers of Southern Colorado wins were four points and 2:34 away from into the fourth quarter. The Southern Utah Miners put a stop to Southern Utah's Dave Fadell, which set up SUSC for the winning TD. Mollica passed for one first down, ran for the clock. Mollica had made the game's first score in the first quarter, on a 10 yard keeper. The kick was good. Miners responded in the second quarter with a 12 yard pass from Gill to tight end Tom Kay. "I feel that we've been improving with each game. We got another shot at DU soon," said Pearson.

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According to CSM Coach Bob Klock, Mines will play out of its strongest and most consistent players over this fall. "We'll see what we have left at this point," said Klock. "We have some good things going for us," said Kay. "We were beat by two of the smartest hitters in the conference, and they were both close, good games."

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Deng Xiaoping, Vice Chairman of the Central Committee of the Chinese Communist party, and Fang Yi, Vice Premier of the State Council, welcomed delegates attending a mining symposium organized by Miller Freeman Publications, Inc. of San Francisco.

Miller Freeman representatives at the banquet included George O. Argall, Jr., E.M. '35, Symposium Chairman, and George H. Roman, Managing Director of the China Business Division. Chinese officials present included Zhou Peiyuan, Chairman of the China Association for Science and Technology; Yan Jioi, Vice President of the Chinese Academy of Sciences; Gao Yangwen, Minister of the Coal Industry; and Tang Ke, Minister of the Metallurgical Industry.

The symposium, on mine planning and development, was co-sponsored by World Mining and World Coal, the China Coal Society and the Chinese Society of Metallurgists. It was held September 18-27 in Beijing and Beidaihe, a seaside resort in northern China. Four hundred ninety delegates and guests from 34 countries attended the symposium.

Kaiser Endowment

KAISER ENDOWMENT—The Kaiser Aluminum & Chemical Corporation has long had an interest in providing scholarships and fellowships to deserving minority students at the Colorado School of Mines. Above, the $35,000 installment on a $105,000 endowment fund is handed to President Guy T. McBride, Jr. (second from right) by Steven Harvey (CSM graduate, Metallurgy 1963), staff metallurgist for the Kaiser Aluminum & Chemical Corp. of Spokane, Washington. Monies from the endowment fund will be used for merit scholarships. Current recipients of $2,000 Kaiser scholarships are Marty L. Martinez (left) of La Jara, Colorado and Phillip LaGreca (right) of Denver.

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Dr. Harry Kent, Director of the Potential Gas Agency, has been commended by the International Institute for Applied Systems Analysis (IIASA) for his efforts in the Joint IIASA-CSM Conference on Conventional and Unconventional World Natural Gas Resources, June 30-July 4, in Laxenburg, Austria. Michel Grenon of IIASA cited Kent for "valuable help in gathering a very wide collection of speakers and papers and for his continuous attendance and support" during the conference.

The Department of Military Science has a new cadre of instructors for the 1980-81 school year.

Jerry P. Illgenfritz, Lieutenant Colonel, is the new Professor of Military Science. A graduate of Mines in 1963 in Mining Engineering, he earned his MS in Industrial Engineering from Arizona State University in 1966. His most recent assignment was Inspector General at the White Sands Missile Range in White Sands, New Mexico.

Bruce P. O'Leary, Major, is an Assistant Professor of Military Science. He earned his BS in Economics from Norwich University in 1968 and a MBA in Operations Research from the Florida Institute of Technology in 1980. His most recent assignment was the 39th Engineer Battalion at Fort Devens, MA.

Charles W. Foster, Captain, is also an Assistant Professor of Military Science. He earned his BS and MS in Civil Engineering from the University of Missouri, Rolla, in 1969 and 1970. His most recent assignment was Procurement Officer, US Army Engineer District, Far East, Seoul, South Korea.

Richard D. Dilley, Captain, is an Instructor of Military Science. A 1974 graduate of Mines' BS Mining Engineering program, Dilley comes back to Golden, direct from his post of D Company commander, 92nd Engineer Battalion, Fort Gordon, GA.
Dear Mr. Polly,

I would like to express my gratitude for the thoughtfulness you have shown in this letter regarding our school. The time and effort you have invested in understanding our situation and offering your guidance are greatly appreciated. Your suggestions, particularly on the importance of open communication and encouraging personal growth, have been insightful and inspiring.

I believe that your advice reflects the values and principles that have guided our school throughout its history. Your commitment to fostering a community where students can thrive and contribute positively to society is commendable. As we continue to evolve and adapt to the changing landscape of education, we will strive to uphold these values and ensure that every student has the opportunity to reach their full potential.

Thank you once again for your kindness and wisdom. Your words have touched our hearts and provided us with much to reflect upon.

Sincerely,

[Your Name]
The hills of Colorado and other Western states have taken on new life recently, as gold and silver prices rise and visions of wealth entice many serious and full-time miners back to the glory holes and stream beds which may show a little "color." The "gold" and "silver" seekers in the mountains, lonely, hard-working, determined and eventually successful, are few. Except for trappers and nomads, however, the image has long since faded from the mining scene.

Today, the development of precious minerals will almost all take place under the auspices of large, well-funded companies. The skills of mining in the United States today: complicated leasing or purchasing regulations, strict health and safety procedures, and executive tenure tempting. They buy books; invest in gold, silver, platinum, and other precious metals, which may show a little "color." The successful miner back to the glory holes and stream beds which may show a little "color." The "old-timer," haloed about with romance, has all but vanished. In his place, we see corporations, boards of directors, and control of the mining industry. The myths of selecting the mining industry, if it is not to fade away like the "old-timer," is a misapprehension. The "old-timer," haloed about with romanticism, has all but vanished. In his place, we see corporations, boards of directors, and control of the mining industry. The myths of selecting the mining industry, if it is not to fade away like the "old-timer," is a misapprehension.

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