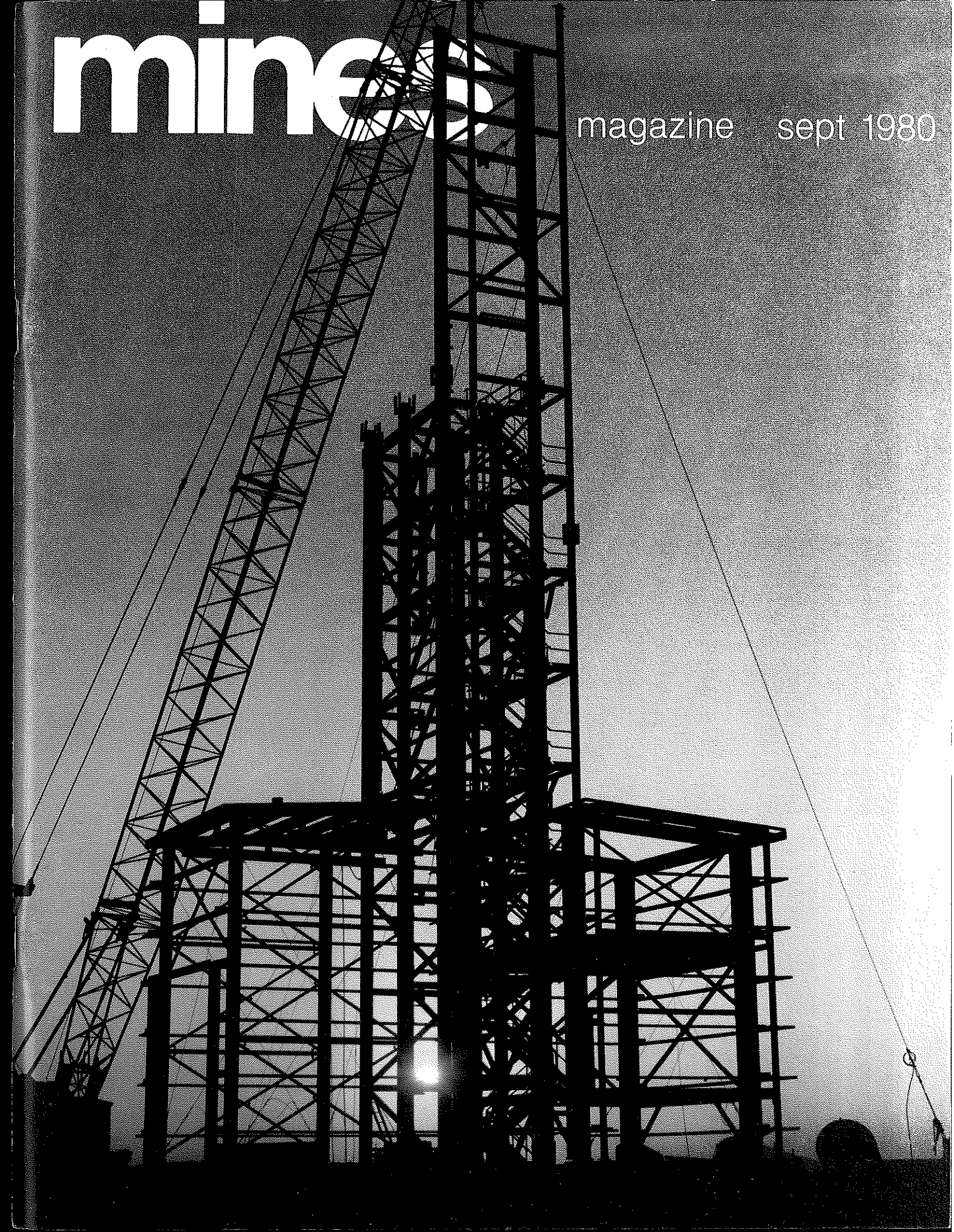


# mines

magazine sept 1980



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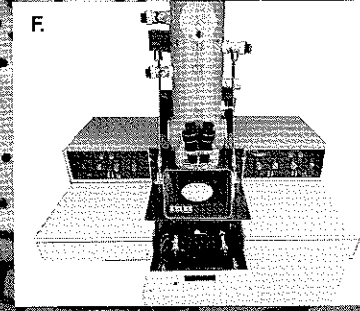
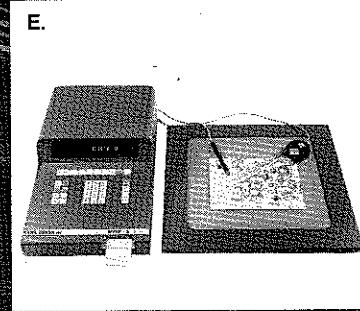
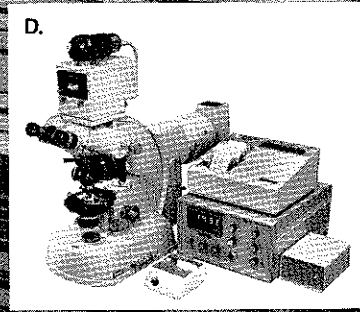
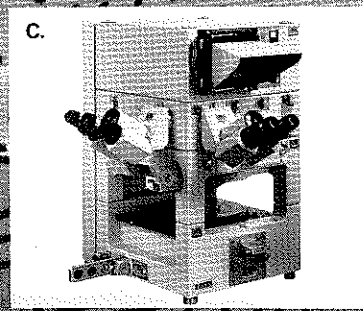
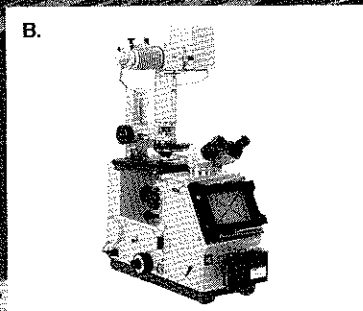
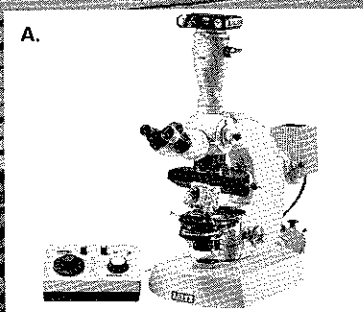
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1980

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Guggenheim Hall  
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### Alumni Events Calendar

- Sept. 23—AMC convention, San Francisco, CA. Luncheon, San Francisco Hilton, 11:30 a.m.
- Sept. 24—SPE convention, Dallas, TX. Luncheon, Loews Anatole; 12:00 a.m.
- Oct. 14-16—Cont. Ed. "Maintenance Management for the Mining Industry," Keystone, CO. For further information contact K.M. Barbour, CSMAA.
- Oct. 23—SME Convention, Minneapolis, MN. Luncheon, The Leamington; 11:30 a.m.
- Oct. 24-25—HOMECOMING, Reunion classes 1960, 1965 & 1970. Banquet, Oct. 24, 6:30 p.m. Holiday Inn West. Game, Oct. 25—Western New Mexico.
- Nov. 4-6—Cont. Ed. "Maintenance Management for the Mining Industry," Denver, CO. For further information contact K.M. Barbour, CSMAA.
- Nov. 12-14—Cont. Ed. "Sixth Institute on Mine Health & Safety," Golden, CO. For further information contact H.W. Emrick, CSM (303) 279-0300, ext. 2321.
- Nov. 16-18—GSA Convention, Atlanta, GA. Luncheon to be announced.
- Nov. 17-21—SExG Convention, Houston, TX. Luncheon to be announced.
- Dec. 5—NWMA Meeting, Spokane, WA. Breakfast, Davenport, 7:30 a.m.
- Dec. 8-9—AIME-Arizona Meeting, Tucson, AZ. Luncheon to be announced.
- Dec. 9-11—Cont. Ed. "Maintenance Management for the Mining Industry," Denver, CO. For further information contact K.M. Barbour, CSMAA.
- Dec. 18-19—DECEMBER CONVOCATION; Banquet, Dec. 18, Green Center, 6 p.m.; Commencement Exercises Dec. 19.
- Feb. 13—CMA Convention, Denver, CO. Luncheon, Denver Athletic Club, 11:30 a.m.
- Feb. 14—FOUNDER'S DAY BANQUET. Dinner to be announced.
- Feb. 22-26—AIME National, Chicago, IL. Breakfast to be announced.
- May 7-9—1981 COMMENCEMENT, Reunion classes are 1926, 1931, 1936, 1941, 1946, 1951 & 1956. Banquet—May 8, Green Center, 6:00 p.m.; Commencement Exercises—May 9.

# mines magazine

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september, 1980

number 7

## features

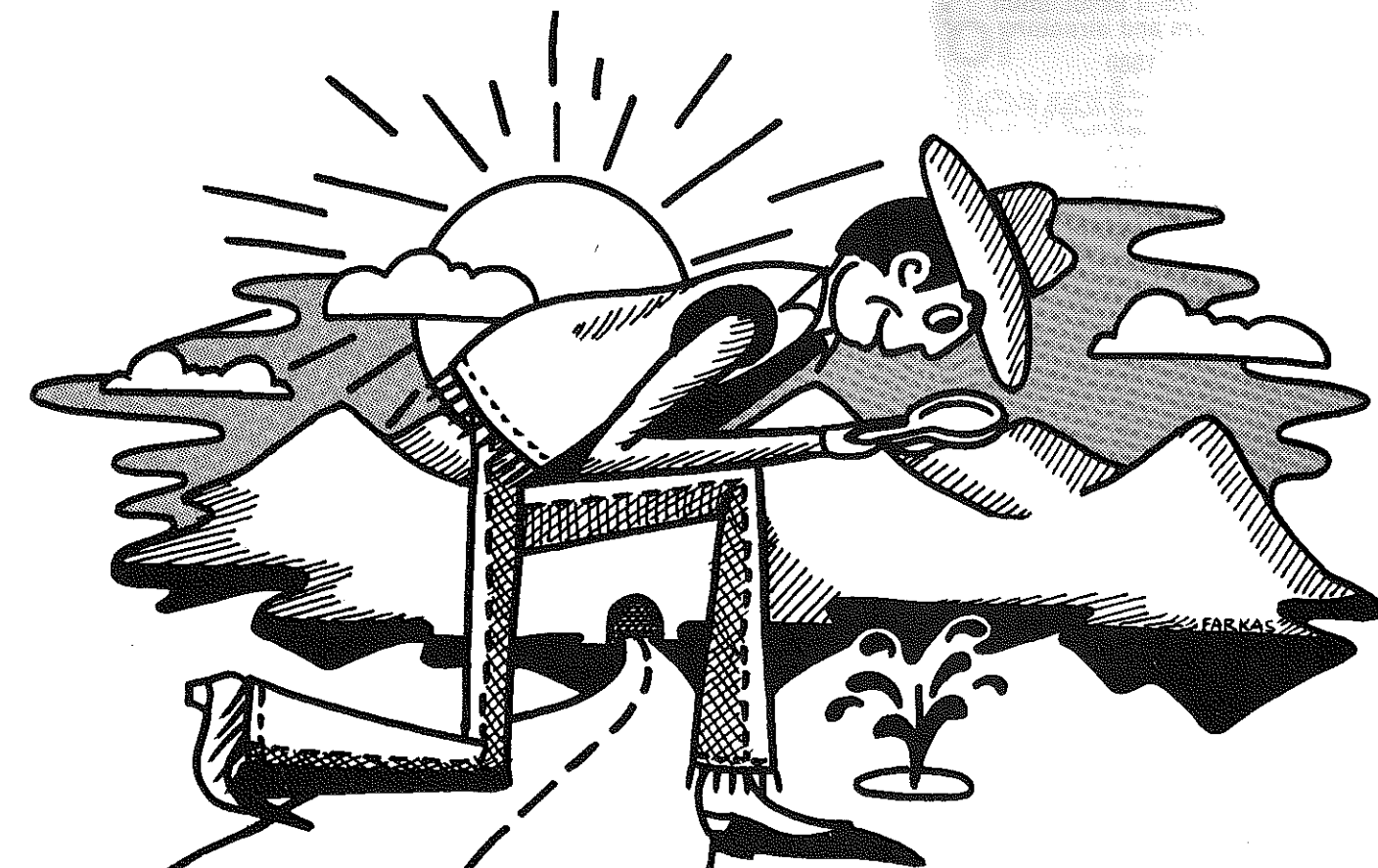
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 Patricia Curtis Petty
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 Karl R. Nelson and Stephen M. McKenna
- Trustees' Summer Keystone Conference* 18  
 Brodie Farquhar

COVER: Skeletal headframe in early construction phase at Weeks Island, LA. Photo courtesy Fronter Kemper Constructors

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## Our frontiers haven't vanished, they're just harder to find.

That's the challenge - the great search for oil and gas reserves. This country is not running out of reserves, but they certainly are getting harder to find.

At Amoco Production, we realize that people are the key to a bright energy future. With supplies becoming critical, we are aware that it will take a super effort on our part to keep up with the demand.

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Whether it be offshore drilling, exploration or production, the challenge is there for you at Amoco. Although the days of the Old West are gone forever, the pioneering spirit is still alive and thriving at Amoco Production.

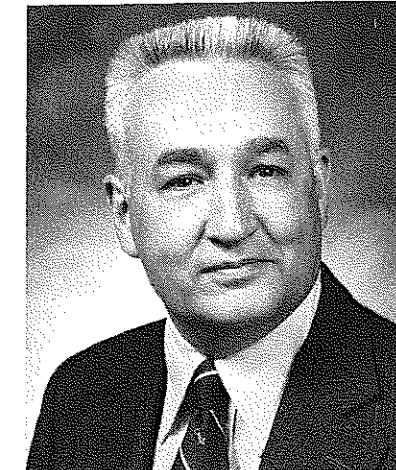


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 Recruiters will be on campus  
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 Engineering (Dec. grads)  
 November 10-11, 1980—  
 P.E., CPR, Geol. Engr.

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## comments . . .



## A Review and Recommendation

by George W. Mitchell, Jr., '53

As many of you know, I recently resigned from the position of Executive Director of the CSM Alumni Association to accept a position in the mining industry.

My four and one-half years at Mines have been exciting ones. I think it is safe to say that the combined efforts of the Board of Directors, many, many hard working volunteer alumni, and a dedicated staff have resulted in significant progress in the development of the Association. A few examples that illustrate progress during this period:

- Association *membership* is now over 4,000, larger than ever before, and close to 50% of all living alumni.

- Association *revenues* have increased from \$100,000 to \$260,000 per year, with our financial results solidly "in the black."

- The Association has *expanded and intensified service* to alumni with continuing education programs, an effective placement service, a widely read MINES Magazine, a range of student services and local section support.

- The Association has taken an *active role in supporting Mines* by providing support to the development program, by maintaining records on alumni and by participating in the planning process for Mines.

This period has also been among the most satisfying of my professional life. The opportunity to work closely with so many alumni and the faculty and administration at Mines has been a stimulating experience. The progress has been significant and I think we can all feel good about the effective role that the Association is playing in being of support to

Mines and of service to alumni.

Even with this progress, many areas remain in which the Association needs to make further improvement and to become an even more vital force at Mines.

The objectives and programs of the Association have been published during the past two years in a brochure, "What Your Association is All About," mailed to all alumni. The information is also published annually in the MINES Directory, which you recently received. These objectives and the programs which result were developed after extensive consultation and discussion with alumni and the Association Board of Directors. The broad consensus is that the first priority objective is the maintenance of the relationship between the alumnus and the School and mobilizing alumni in support of Mines. A second priority is providing service to alumni for professional and personal development.

The interest Mines alumni have in supporting their school is illustrated by the way in which so many alumni have flocked to the banner of The Resource Fund, the major development program. Alumni are making significant contributions by their volunteer effort and their financial commitments. Of the \$25.0 million now committed to the Fund, over \$9.0 million has come from alumni.

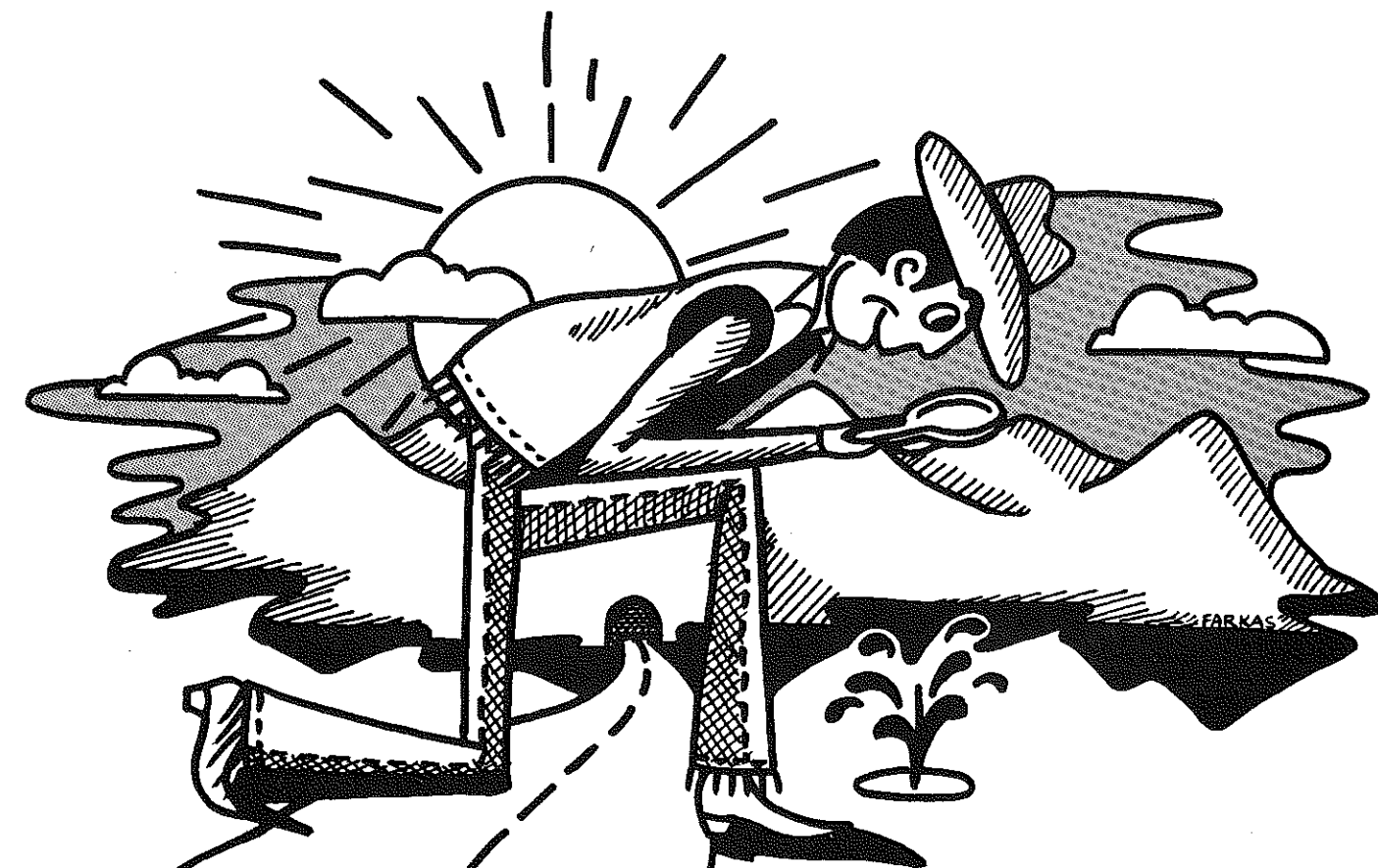
We have made good progress in serving each of these objectives in the past four and one-half years. In my judgment, however, the Association should be doing a great deal more in our top priority area, support of the School. At present the requirement for financial independence established by the CSMAA

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I have urged the Board to seek financial support from the School and the CSM Foundation to enable the Association to expand its activities in these vital areas. Even with a substantial degree of support, our Association will still be far more financially self sufficient than any other alumni association. The situation nationally is that almost all alumni associations are supported completely or in large measure by their institutions. With additional support, the Association can be more active while maintaining break-even financial results.

With the resources to be more effective in these vital, top priority areas, our Association can further develop as a vital force at CSM and be able to do its part in making sure that our School continues to grow in stature as the world's pre-eminent college of mineral engineering.

*George W. Mitchell, Jr.*



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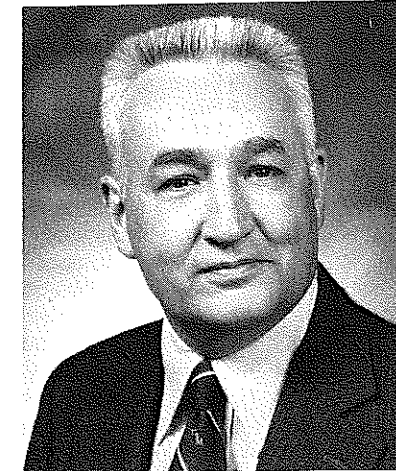
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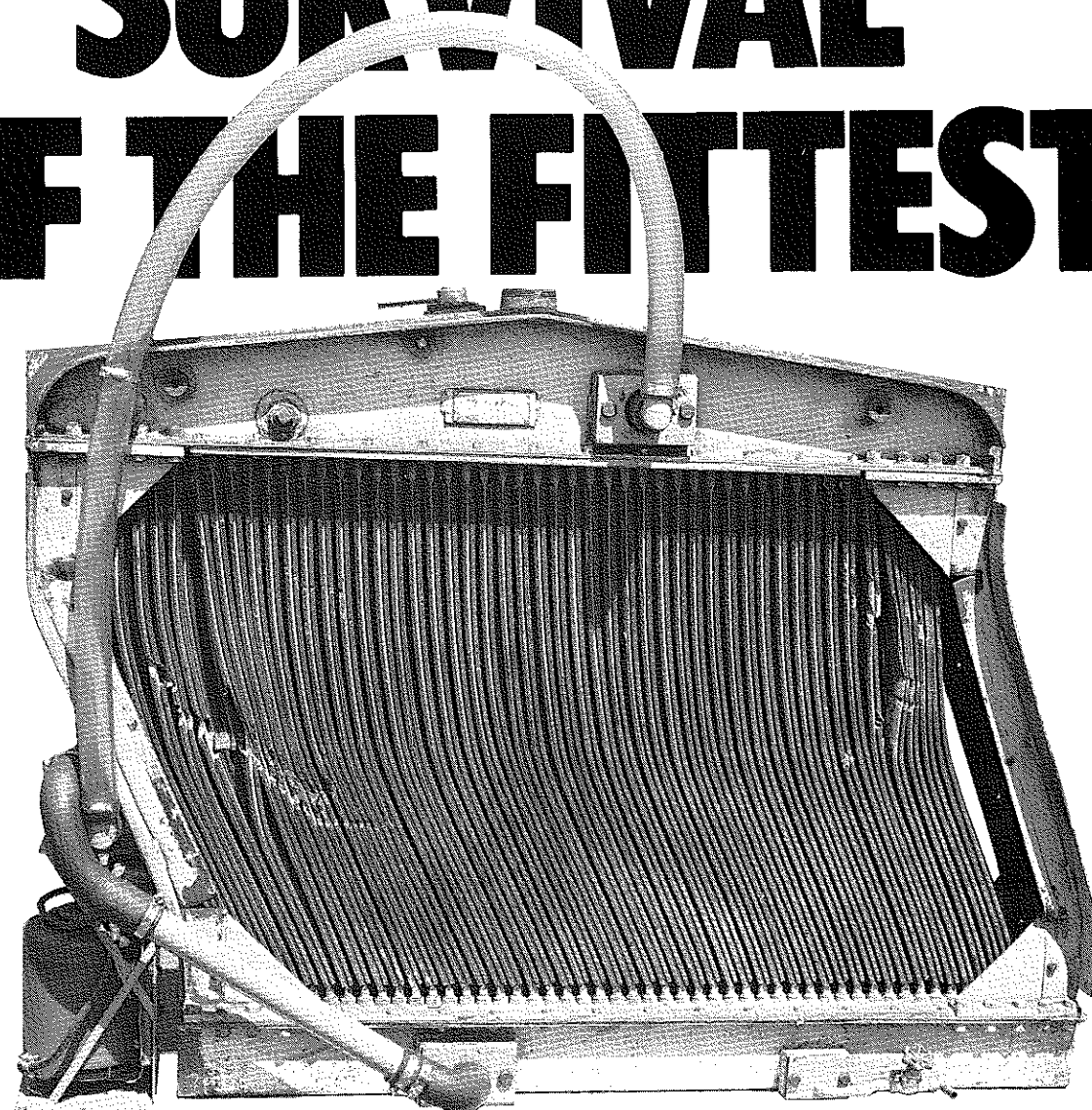
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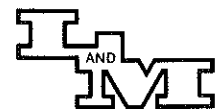
This was an extraordinary test of the MESABI Core Radiator to withstand punishment without leaking. It was an uncontrolled test we wouldn't want our R & D engineers to duplicate. The point here is to show how the design of the MESABI Core relieves the threat of equipment downtime caused by leaking radiator seams or punctures.

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## Fast Track Design and Construct

by Dennis McInerny, '66

In early 1977, Morton Salt Company was informed of the U.S. Government's desire to acquire the Weeks Island, Louisiana, salt mine for conversion to a Strategic Petroleum Reserve. The scheduled acquisition date of this producing property did not allow time for the completion of an entirely new facility without a curtailment of production for a period of approximately two years.

In order to preserve a marketing position in the salt industry, Morton Salt Company conceived a plan whereby temporary production could be achieved for the length of time necessary to complete a new mine. This plan was dependent on several factors. (1) Government approval was necessary, as the temporary mine was to be located at a higher elevation in the salt dome than the oil storage and would require common use of the existing shaft. (2) Complete evacuation of the lower levels of the mine was necessary by a certain date to allow placement of the necessary vapor and explosion seals. (3) A new material-handling system was required to assure a smooth transition of production from the lower to the upper level. The new mine had to be designed and constructed as soon as possible since the salt reserves at the higher elevation were limited.

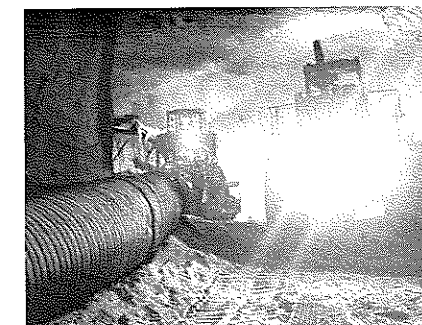
Assuming government approval of the temporary mine, Morton Salt Company engaged Frontier-Kemper Constructors in May of 1977 to act as the construction manager for the fast track design and construct of both the temporary Markel Mine and the new mine. Excavation of the incline in the existing mine leading to the upper level was scheduled to begin on July 15, 1977. Design and mobilization for the new mine were to begin immediately.

### Markel Mine Development

Prior to the start of incline excavation, several pieces of equipment had to be procured, disassembled, lowered down a 5' x 7' shaft and reassembled on the lower level. Two Cat 988-B front-end loaders, one Joy twin-boom jumbo and several smaller pieces of equipment were so handled.

Ventilation of the incline presented possible problems for the mine as this work was off the intake air entry. Use of catalytic scrubbers on all equipment and explosives with good fume characteristics alleviated any problem until later in the project. Excavation methods were conventional drill and blast with LHD mucking using the Cat front-end loaders. No undercutter was in use at this time. Excavated salt was spoiled into existing rooms in the mine.

Excavation was started on the incline July 25, 1977 and proceeded for 2800 LF by mid-November, 1977. At this point, a water inflow problem was



Deep in the Markel salt mine, where oil storage depositories are being built.

encountered due to the proximity of the drift to the top of the dome. Grouting and exploratory drilling proceeded for two months in an effort to not only seal off the water, but to find a path around it to allow the temporary mine development to continue.

Concurrent with the probing and grouting, a crosscut drift was driven and a 4' diameter raise was bored to allow mucking to proceed without the existing 3,000' one-way haul. This raise was never allowed to fill and was mucked continuously at the bottom by another front-end loader.

A ventilation problem developed as a result of a short-circuit in the mine's air supply. Electrically-operated doors and regulators were installed to provide the needed distribution of fresh air.

Water inflow was reduced to 0.75 GPM and several possible paths around the water tried. The first two attempts failed but the third proved dry, although

longer than desired. At this point, an undercutter was installed and a dual-heading system with crosscuts was employed to reach the final area of mine development. Total heading advances of 420' per five-day week were common at this time.

Concurrent with the final stages of excavation, a bulk materials-handling system was installed; a crushing and screening plant, 1500 LF of rope con-

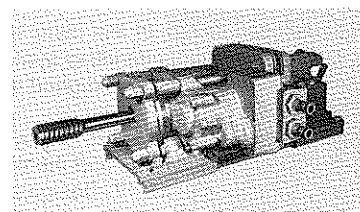


Sand becomes chunks of frozen material under the freezing techniques employed in this shaft.

Since 1979, a minority interest in Frontier-Kemper has been held by Deilmann-Haniel GmbH, Dortmund, Germany. The more than 100 years of shaft-sinking and tunneling technology of the German firm is being assimilated and put into practice at FKC. This experience covers many countries and a variety of techniques and equipment design.

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## Geologic Background

Salt domes occur in the Gulf Coast region of the United States in many sizes, shapes and at varying depths. Commercial production of salt by evaporation began in the early nineteenth century. Quarrying produced 10,000 to 30,000 tons of salt at the Avery Island Mine during the Civil War. Underground mining development was delayed due to the problems of penetrating and sealing the saturated soils overlying the domes. The existing Weeks Island Mine, coveted by the U.S. Government, has been in continuous operation since 1902 and consists of two levels with an open room and pillar development of 83 million barrels volume.

The salt structure at Weeks Island is actually a stock heaved upward through the overlying sediments to roughly form a dome two miles in diameter and extending more than 30,000 feet below ground level. The dome is entirely salt with occasional bands of anhydrite and is generally watertight, assuming reasonable distances from the edges. Common deviations from this homogeneity are sandstone inclusions and random pockets of highly pressurized loose salt.

Headings are driven by normal drill-and-blast methods with the assistance of an undercutter. No real support other than occasional rock bolts is necessary and room widths of 65' feet have been achieved. Benches are taken in two passes and mined by normal quarrying procedures. The final result being a room and pillar system with room sizes of 90 feet high and 65 feet wide.

veyors, a 100 ton surge bin and a set of 8 ton skip loaders.

The new mine drifts were connected to the existing shaft with a road-header machine allowing breakthrough and installation of skip loaders with no loss of production time.

Production from the old mining level was discontinued on a Friday evening and resumed from the new level on the following Monday morning.

This coordinated scheduling allowed the Department of Energy to meet their deadline for occupancy of the lower level of the mine and Morton Salt Company to continue salt production at a critical time in its marketing cycle.

## New Mine Development

The salt contact at Weeks Island is 150' below ground level. The water table roughly coincides with mean sea level at a 60' depth. Overburden consists mainly of a dense silty sand. Freezing was selected as the most economical method of temporary ground support and water control during the excavation and sealing of the mine shafts.

Two 18' diameter, 1,300' deep shafts were decided upon with a concrete lining extending only 150' into the salt dome itself. One shaft was designed for production and the other for men and materials.

Freezing designs were generated as quickly as possible after receipt of soils information. Construction of freeze cellars was begun in August 1977, and freeze-hole drilling was initiated immediately following cellar completion. Thirty-seven freeze holes along with three temperature-monitoring holes were used.

The distance between shafts was 540

LF and a central freeze plant location was chosen intending to freeze the shafts, one at a time. Subsequently, both shafts were frozen simultaneously which led to some interesting problems.

Ca C1 was used as the freezing medium and brine out temperatures



*Intricate pipe and valve system surrounding the freeze collar.*

were in the range of minus 40 degrees Fahrenheit. Excavation proceeded as soon as the unsaturated sediments exhibited sufficient stand-up time to allow placement of the one-foot thick concrete temporary lining. Penetration of the water table depended upon the freezing of the saturated silt layer of two-foot thickness overlying the dome. The inferred freezing point of this material was minus six degrees Fahrenheit.

During the wait for this deep tempera-

ture freezing, headframe erection was accomplished.

Excavation was done using an air-powered impact breaker and hand-held pavement breakers. No shooting was done in the area of the freeze pipes in light of the problems caused by a possible freeze pipe rupture.

Temperatures were monitored by a multiplex unit and printed on a chart recorder from the thermistors placed at predetermined elevations in the temperature control holes.

Penetration of the black silt layer and the initial salt excavations were done on a round-the-clock basis to reduce any chance of loss of freeze wall. The temporary concrete lining was carried only 30' into the salt as below that it was unnecessary. Controlled blasting was used below the frozen zone and above the main foundation (approximately 100'). The main foundation area for the final concrete lining was excavated by hand and shaped to a certain configuration.

The final lining in both shafts was a 2'-3" thick, double-reinforced concrete lining with an annular space between it and the initial lining in the OB section or the salt below the contact. This lining was formed by a double wall slipform and poured continuously over an approximate ten-day period.

The slipforming operation presented some interesting logistical problems. Due to the double wall design, a yoke connecting both forms was necessary. This yoke rose with the form as it was pulled to the surface and prevented any horizontal reinforcing steel from being installed any more than 4' above the form. Consequently, the rebar and concrete placement deck was congested and quite a busy place during the slipping operation. Lowering rebar, concrete, crews and miscellaneous supplies all had to be done with the same hook. Effective scheduling and some rather frantic action resulted in slip rates of as much as 4' per hour.

The actual seal in the salt was achieved by the tremie placement of a bituminous material in the annular space behind the final lining. This bitumen was placed as a fluid at plus 300 degrees Fahrenheit and remained a fluid even after cooling (albeit a highly viscose

one). The combined effect of the high specific gravity and the head differential of the bitumen combine to assure no penetration of sea water into the shaft. The formed space between linings also reduces the possibility of cracking of the lining due to tectonic movement.

Freezing was discontinued when the bitumen level was above the water table. Thawing of the frozen soil required 5 months to reach ground temperatures of plus 32 degrees Fahrenheit. Freeze holes were grouted and abandoned at a later date.

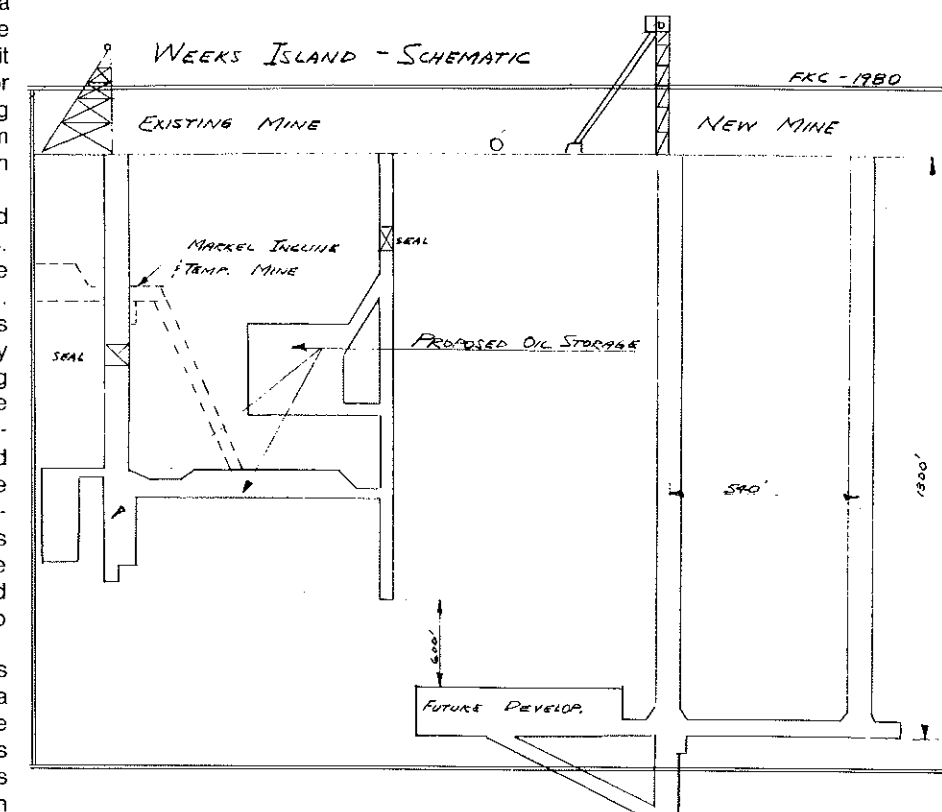
Shaft sinking in the salt proceeded immediately after bitumen placement. Using hand-held augers and 630 EIMCO's, advance rates of 120' per week were achieved. No concrete lining was installed, and after initial scaling, the salt ribs held up very well.

Development consisted of large shaft stations again unsupported with no concrete and large rectangular entries (23' x 30'). An approximate bottom development volume of 50,000 CY was initially

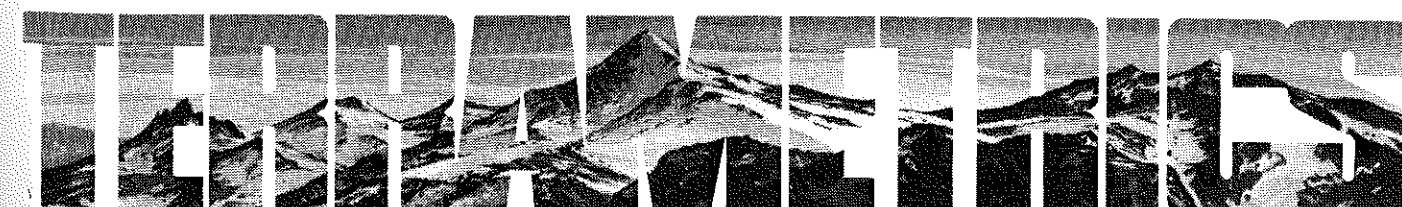
envisioned, but with field changes should approach 80,000 CY.

After connecting the shafts at the mining level, one shaft was used to hoist bottom development salt and one shaft was equipped. Hoisting of development salt was facilitated by the use of a larger shaft bucket and loading hopper. The hopper was charged by a 945 Fiat-Allis front-end loader and held one bucket's storage. Salt hoisted at this time was dumped at the surface, conveyed over a nearby hill and dissolved by means of hydraulic monitors. The natural climatic conditions of Southwestern Louisiana also helped in this dissolution effort.

Shaft equipping for the Weeks Island Mine consisted of an entirely timber system. Buntons and guides were Karri wood with the top 200' of each shaft requiring fire retardant treatment. Buntons were installed in pockets drilled in the salt on 10' centers and the guides attached with an adjustable bracket. The production shaft will carry two 16 ton skips along with some utility lines. The



*Weeks Island shaft, showing the various elements encountered.*



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service shaft will carry a 8' x 12' man and material cage. Steel shaft appurtenances were used at the loading pocket and collar only. Corrosive conditions present at the salt mines on the Gulf Coast strongly influenced the choice of a timber shaft system.

Concurrent with the production shaft equipping, mine development was continuing. Excavation proceeded to a certain stage and the installation of the material-handling equipment was begun. A system of initial crushing by feeder-breaker followed by a closed-circuit crushing and screening plant leading to a 100 ton storage bin feeding the skip loaders is being installed. Two mobile cranes were among the additional equipment installed to aid in the installation of the material-handling equipment. Roof-mounted conveyors at heights of 40' or more dictated the use of remote basket cherry pickers in addition to the mobile cranes. When fully operational, this system will be capable of production rates of 600 tons per hour.

Surface facilities are, in the final analysis, standard for the area: ground-mounted double-drum winding at the production shaft and single-drum winding at the service shaft. In the beginning, tower-mounted Koepe hoists were planned to take advantage of equipment already owned by Morton Salt Company. After removal of this equipment (hoist and electric) from a tower-mounted headframe in up-state New York, the decision was made to procure a standard double-drum winder and sell the Koepe hoists. Several factors influenced this decision, not the least of which was the corrosive and occasionally windy environment peculiar to this area of the Gulf Coast.

A Canadian Ingersoll-Rand, 3000 horsepower, 12' diameter double drum hoist was purchased and removed from a Falconbridge Nickel Mine in Sudbury, Ontario and subsequently installed at the production shaft. Suitable enclosures with regulated air were designed for the hoist and ancillary electric equipment. A 10 ton overhead crane along with a 40' eave height hoist house aided greatly with the assembly of the hoist.

Adjoining the hoist house is the change facility along with mine offices. All these structures were either concrete block or PVC sheeted steel frame buildings, another concession to the corrosive climate.

Production headframe erection is proceeding at this time. A standard two-compartment headframe was modified by the addition of a wind leg to resist the effect of hurricane-force winds (150 mph). Pipe backlegs were used to mitigate the corrosive effects of salt grains trapped on the steel structure. A complex and expensive coating system was specified and applied to the headframe. Decisions on the effectiveness of this

system must await inspection at an interval of three to five years post erection.

The headframe foundations are pile supported except for that portion founded on the final shaft lining. Problems of settlement and/or heave are to be handled by jacking brackets located at all foundation points. The Week Island dome is a historically stable one and mining methods should not change that stability, but provisions for adjustment are present. An analysis of the other four dome mines and problems encountered would lead one to be skeptical about claims of stability.

The surface conveyor taking the salt from the production shaft bin to an existing conveyor is a pile-supported wood structure. Glue laminated stringers cover 50' spans supporting a totally enclosed fixed-frame conveyor. A junction house structure was constructed at the intersection of the conveyor with the existing surface system allowing production to continue from both the Markel and new mines.

Completion of this entire project is scheduled for late 1980 and will mark the first new salt mine on the Gulf Coast since 1961.

#### Summary

In retrospect, the management of a large, fast track design-construct project demands the use of skills different from those required by straight contract construction. Owner-designer-contractor relations take on a much more important role and one that cannot be allowed to become an adversary one. Even with the best of operating procedures, events happen which can quickly degenerate into confrontations.

Obviously all parties are concerned with the successful completion of the project. The problem lies in the proper definition of role that each participant must play and the responsibility exercised to see that each fulfills his obligation promptly and in full.

FKC feels that this project will serve as an example of a successful use of the fast track design-construct method, primarily due to the knowledge of the owner, skill of the designer and patience of the contractor.

*Dennis P. McInerney, E.M. 1966, has more than fourteen years of experience in heavy construction with an emphasis on underground work. He has worked in many capacities, from field engineer to project manager. He served as the latter on the project described in the foregoing article. His professional affiliations include ASCE and AIME, and he is a registered professional engineer in New York State. As an undergraduate at Mines, McInerney was the recipient of numerous awards for scholarship and ability.*

# Construction and Philosophy

by Patricia Curtis Petty

Recent news releases this summer carried items about two different projects—a new one just beginning, and a record-breaking achievement at the other. Both these projects, although separated by many miles, concerned the same company, Denver-based Harrison Western Corporation.

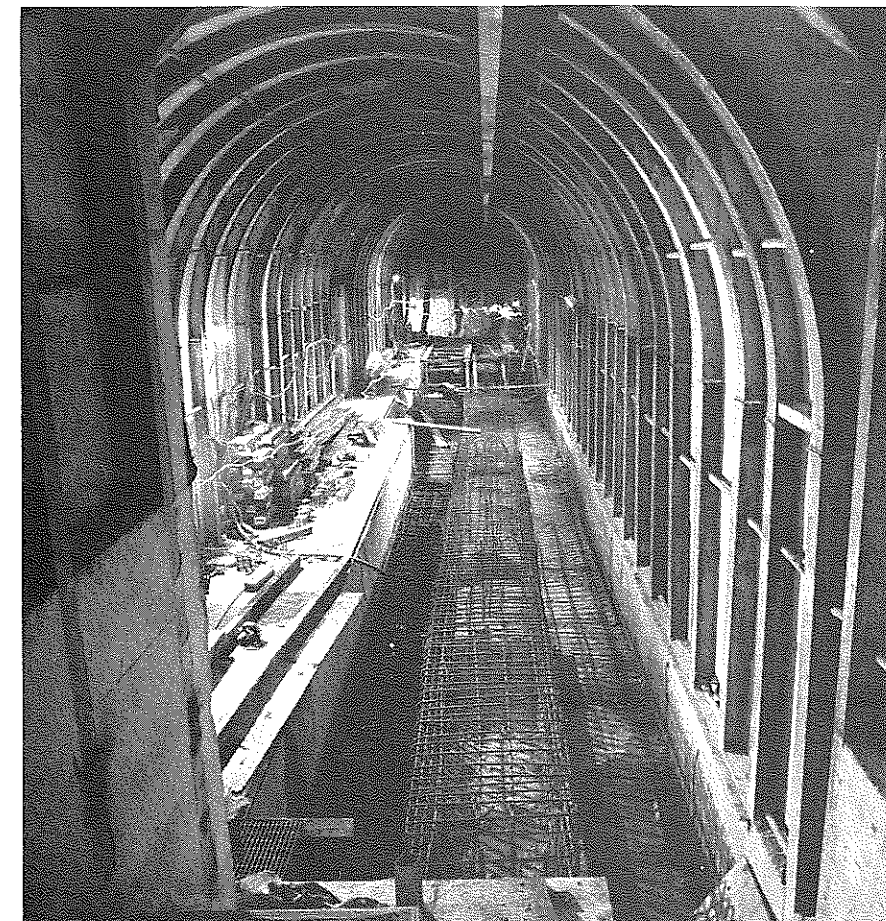
This is not the first time Harrison Western has been involved in a record-breaking activity—in fact, the record broken in the Ambrosia Lake District of New Mexico was the company's own, set on a previous project in that same area. Nor is it unusual to read that a construction firm is beginning a new project, that is the reason for existence for such companies—finish off a job here, work to break records on shaft excavation there—then move on to the next big challenge.

The noteworthy thing about Harrison Western Corporation these days is the philosophy held by its new owner, Allan G. Provost, E.M. 1962. Associated with the company since the late 1950's, Provost recently joined with the F.J.C. Lilley Company, Glasgow, Scotland, to purchase the firm. The partnership places Provost in the presidency of the organization, and gives him the opportunity to move into an international arena with the Lilley group.

F.J.C. Lilley is a large firm, best-known in the construction world for its civil engineering projects around the world. A long history of successful tunnel excavation for various community uses, such as underground railway systems, large cable conduits and water and sewage systems around the world is a hallmark of one of the divisions of the company. North Sea harbor facilities have proven to be another large area of operations for Lilley, and the company's crews have worked on harbor enlargements and construction in the Arabian Gulf. Although based in conservative Glasgow, world wide activities of the firm lend an exotic flavor.

It is this world-wide aspect that excites the new president of Harrison Western. With his own experience in mining operations and civil engineering in the U.S. and the expertise and advice of his giant new partner, Provost intends to expand his market in as many foreign areas as possible.

There is a political philosophy behind this ambition of Allan Provost which is intriguing in today's uncertain world situation. He says, "If the United States



Long view of the tunnel constructed in the Yukon by Harrison Western for the Northern Canada Power Commission Aishihik project.

system of government is not continually explained and pushed in the developing Third World countries, the vacuum will be filled by Communist nations or others inimical to the U.S." It is his conviction that the developing nations must be given large amounts of technical assistance, and facilities to enable them to take advantage of their own natural resources, must be constructed. He feels that most American firms have the technical expertise to accomplish these ends, plus, in most cases, a sincere desire to become involved.

On the other hand, he argues, many of the Communist countries lack the ability to follow up on projects begun, or the equipment or materials to maintain any activity once it is constructed.

Provost sees a number of factors as being important in the development of his ideas. The primary responsibility for encouraging American firms to engage in more development in the Third World

must lie, he feels, with the government of this country. The current tax structure, particularly those personal income taxes which have been imposed so heavily on Americans working overseas, needs to be examined. The legendary American engineer, able to solve many problems as he ranged across the world, is a vanishing figure. A great number of these people, who could work advantageously in the solutions to the Third World dilemmas, are unwilling to work overseas, paying what amounts to double taxation—to the U.S. and to the host country. Some companies are assisting their foreign-based personnel with this burden, but more and more Americans are electing to stay in the U.S. to avoid the problems of this system.

Pointing to the tremendous development opportunities and problems in just the Western Hemisphere, Provost notes that outside capital must be invested in

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these nations to allow them exercise of their full potential in the world arena. Past experience has shown that this form of investment, with money being channeled into a developing nation without sufficient technical personnel avail-

able, has resulted in heavy losses for the various investment entities, such as the World Bank. He sees the future holding much more promise for joint venture types of activities, with each partner bearing an equal share of the responsibility for success of the project.

In June of this year, Provost joined with others from his firm and from Colorado to travel to China, where he presented a technical paper on shaft sinking and tunneling at the Mining Exchange Seminar in Beijing. The conference was designed as an information forum and was arranged, in part, by the Governor of Colorado, Richard D. Lamm. Prior to the trip, Provost noted that, "We may see a considerable amount of trade between our mining industry and China's over the next few years."

He returned with a great deal of admiration for the Chinese applications of

mining technology which he heard about at the conference and was able to view in person while traveling about the country. He cited one mine, the Right-Through-the-Mountain copper mine, which is, in his opinion, one of the most labor-effective mines operating. The underground activity provides a living for 3,000 people, a figure which includes a whole community, since teachers, office personnel, and others are considered to be directly related to the project.

Other examples of advances and applications of Chinese technological advancement noted by the group were the shaft freezing techniques and the large number of such shafts existing in China.

Provost points out that the Chinese have a strong emphasis on the conservation of equipment and the proper maintenance of all working installations. He said that the visitors were surprised

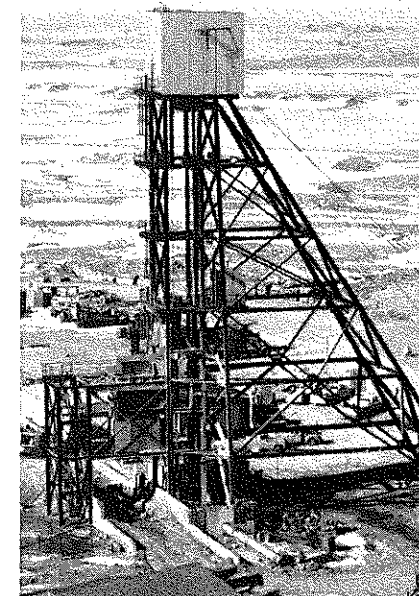
at the range of equipment in use; very old engines to the most modern, limited-use machinery adapted for wider purposes and meshing of modern and old-fashioned technology. He cites this conservation theme as being contrary to that practiced in the United States, and gives it as one possible reason for taking a good look at possible joint venture projects between the two countries. "We have a lot to learn from this idea of conserving resources," he states.

It is Provost's belief that U.S. industry has begun to understand and react to the differences in methods of doing business between this country and others—particularly Third World nations. The "react and revenge" attitudes of the auto industry, for example, he feels, have seldom been in evidence in the mining and construction business in overseas work. These industries are, therefore, in a better position to cope with the ever-more difficult problems of laws and customs in the developing nations.

Government bears a heavy responsibility in bringing about a positive effect in the world market position of the construction companies, according to Provost. There must be a recognition of the cultural influences at work on the American company working on foreign soil, with some changes in current laws which restrict the ability of the company to negotiate contracts and bids. In addition, he says, the free market concept advocated in some quarters must not be adopted, its usefulness in today's world is very questionable. Instead, he advocates a study of laws pertaining to corporations doing business overseas, with the intent of changing some of the structures to more nearly conform to the facts of foreign development and competition.



Deep underground in the shaft sinking operation at North Morton, United Nuclear mine site.



Frozen landscape surrounds the headframe constructed by H/W for Federal American partners in Wyoming.

If tax restraints were reduced, both corporate and individual and other restrictions ameliorated, Provost feels that the United States businessman functioning abroad could not only expand the country's economic base, but could

serve as a valuable information and cultural conduit for the United States.

Acquaintance with the area of overseas construction qualifies Mr. Provost in stating his beliefs. Born and reared in Canada, he was for many years associated with Patrick Harrison, legendary construction entrepreneur in Canada, who managed a widely scattered business, with projects in many countries. Like many immigrants and naturalized citizens, Provost is extremely loyal to his adopted country, and vitally interested in its progress. He has been involved with a number of foreign construction projects throughout his years in the industry, such as an interesting project undertaken in Kuwait.

Harrison Western bid on and received a contract from the Kuwait government to construct large hydroponic green-

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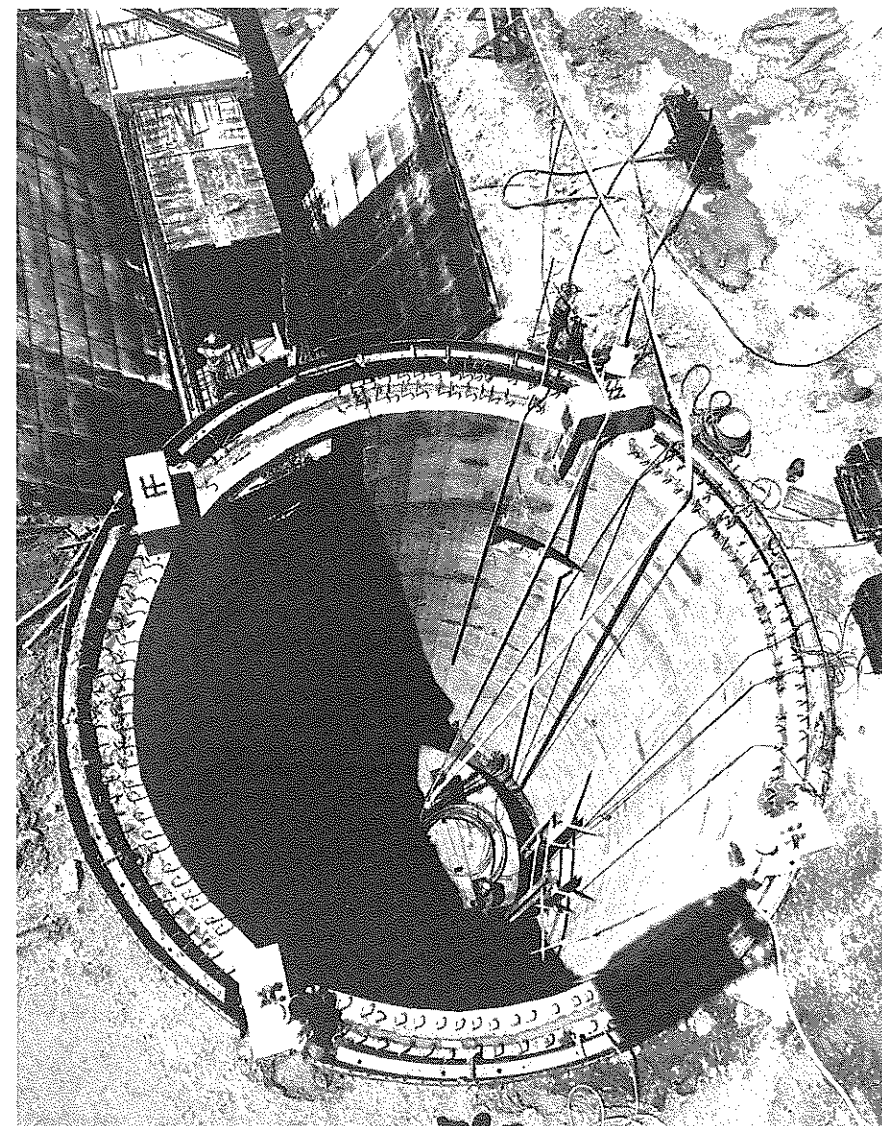
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Shaft under way for the Mt. Taylor mine, Gulf Minerals Corp., in the Grants, New Mexico uranium belt.

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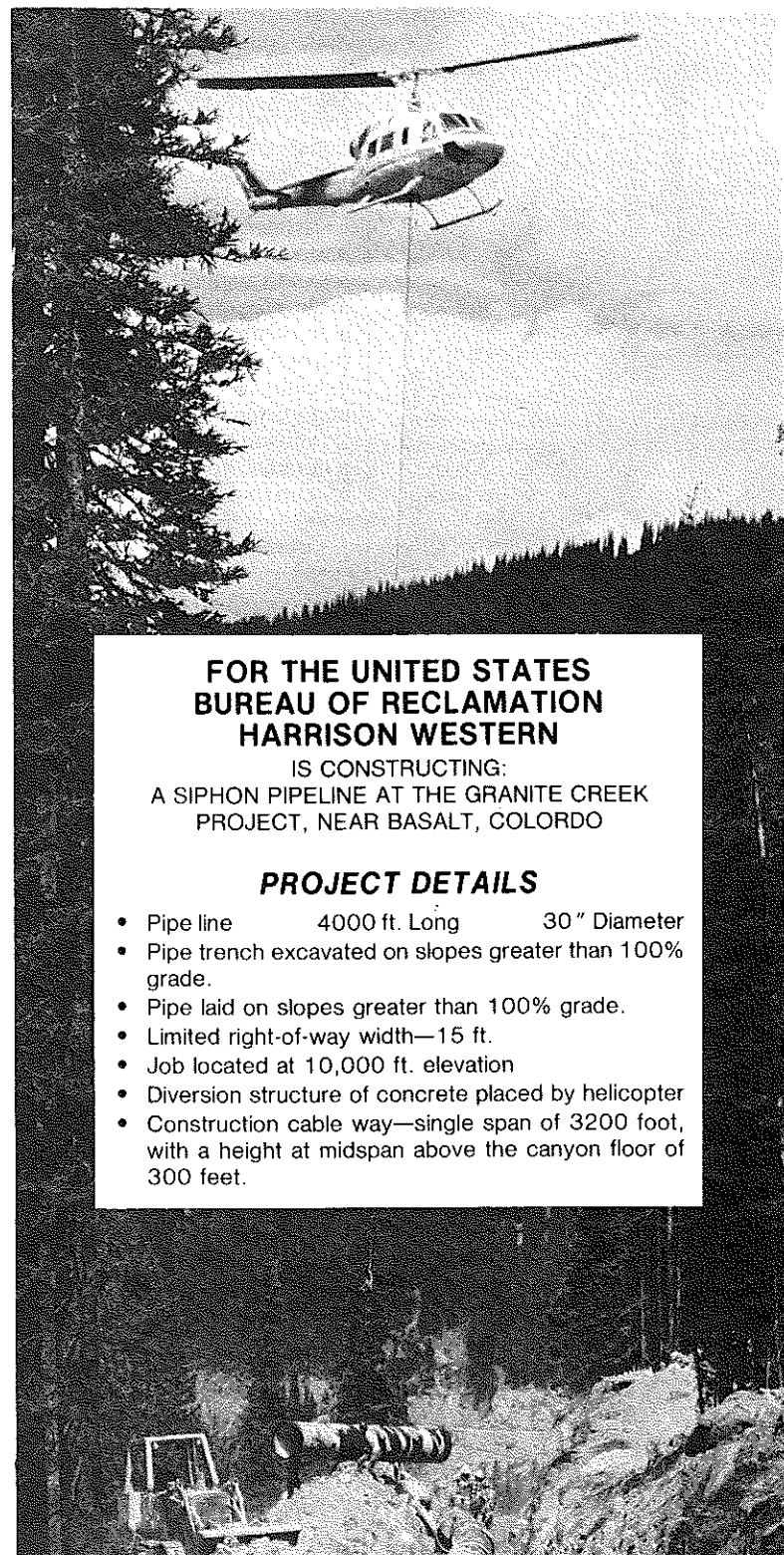
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houses in that arid land. The company designed these installations, meant to produce garden vegetables and animal feed, and installed a pilot project. The cooling systems presented enormous difficulties, but were eventually solved with an evaporative system, modification of a fairly standard technique. The systems are still in use, primarily for the production, on a relatively significant basis, of grass feeds for livestock.

Another example of overseas involvement for Harrison Western was the frozen tundra construction of an entire underground hydroelectric project—including tunnels, shafts, turbine generators, electrical switch yard and all service facilities.

Provost intends to bring the experience gained in these projects, plus a broad background of continental United States project completion, to focus on the increasingly critical area of international development. The company's main emphasis is perceived by many in the industry to be in the tunneling and shaft-sinking area, but he stresses that the capabilities go beyond these two better-known expertises.

One of the more interesting projects completed by Harrison Western is the sinking of the Gulf Minerals Mt. Taylor shafts, near Grants, New Mexico. The shafts involved a number of techniques; freezing, ground control in the notoriously unstable ground of the Grants mineral belt, and extreme problems with water and heat. The project is currently almost ready to turn over to Gulf, with the successful completion of the shafts, installation of machinery and control of the 125°F temperatures and 7,500 gpm water flow. The dewatering process, one of the most extensive in the western United States, also required a 100% capacity back-up pump system, creating some problems in logistics in deploying the pumps.

With three decades in the construction industry behind him, extensive experience in a number of vital areas, and the strong desire to advance the United States' influence in the Third World, Allan Provost is confident that his company will be a real competitor for foreign contracts in the future. He is also confident that, given a better understanding of problems and challenges in the foreign arena, the government of the United States will return to a position of strength in the world development picture. To this end, it is his intent to continue to advocate changes in legislation and trade policy on the part of the government, and pursue better support for U.S. industrial entities capable of furthering progress for the world as a whole.

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# New Energy Sources for the Mineral Industry

by Karl R. Nelson, '69, and Stephen M. McKenna, '78

At the present time, almost all isolated mineral industry complexes use diesel-driven generators to supply their electrical power. These remote sites typically require power for mining, milling, and townsite operations. In the last few years, however, there has been a particularly dramatic increase in the cost of petroleum products, thus producing a consequent increase in electrical power cost. The economic impacts of these higher prices on existing operations can be substantial and even prohibit continued production. During feasibility studies and the economic evaluation of proposed mining facilities, the power cost can be the "make-or-break" factor in the decision process.

In many instances, these power cost increases are further aggravated by the additional, and also increasing, expenses involved in transportation of the fuel to remote industrial sites. In such an economic climate, the possibility of constructing on-site generating plants that require only local, inexpensive energy sources becomes much more attractive, if not mandatory. This

might be true even when such a new plant is heavily capital intensive.

## Alternative Energy Sources

In general, the construction of electrical energy plants using some type of prime energy source, other than fossil fuels, has come to the attention of the public and industrial sectors as "Alternate Energy Sources." This field has been the subject of intensive research and engineering development for a number of years. The spectrum of such sources may be divided into the following broad categories:

- I. Solar—Production of electricity directly by photovoltaic cells or indirectly by solar-heated steam driving a conventional turbine-generator unit.
- II. Wind—Constructing a windmill of some type to drive a generator.
- III. Geothermal—Driving a conventional turbine-generator utilizing the natural thermal gradient of the earth.
- IV. Water—Using low-head, run-of-the-river, or tidal plants to drive turbines.
- V. Thermal—Burning some fuel such as timber, refuse, etc., (other than fossil fuels) to produce steam for turbine power generation.

All of the above sources of energy have been investigated in detail and their individual advantages and shortcomings are fairly well documented. One of the principal problems traditionally associated with all of the above is that they are generally considered as supplemental to an already established power grid. This is not the case for applications on remote mineral-industry sites, where each individual source (or combination of sources) must be designed, constructed and installed to meet all job power requirements at all times. Several of the above alternate energy sources can be tailored to meet this requirement. Unfortunately in some cases, such as wind-powered generators, there is no method to insure 100% production capability at any given time. This factor in itself would not be overly important if there was an adequate power storage technology, but there is no such storage system available today (except in the area of pumped-storage hydroelectric at

a scale and cost far beyond most mineral industry requirements.

## Solar Energy

Solar energy, the most commonly proclaimed alternate energy source in the public sector, is probably the most difficult to employ in the industrial sector for electrical power generation. This is not to say it cannot be done, but the mining industry requires an active, not passive, solar system which, in turn, immediately drives initial capital costs significantly higher.

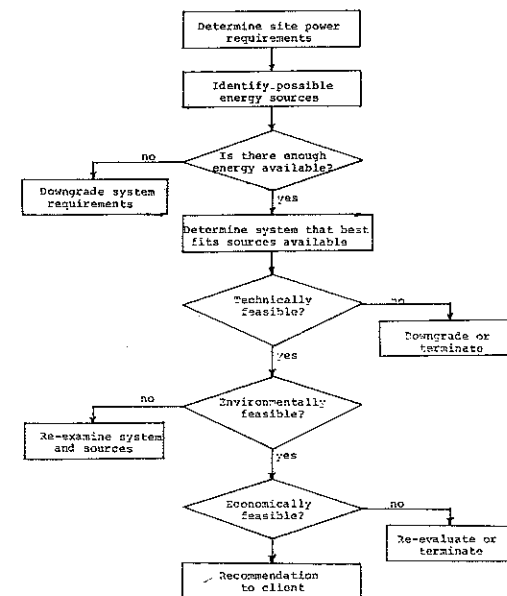
Ideally, a solar plant, for either photovoltaic or thermal conversion would be located in a dry, arid region on the equator. Careful design and site selection may still allow the use of such systems in regions with either few cloud-days and/or long duration sunlight (as in the very high latitudes). The meteorological probabilities cannot be overcome, so periods of insufficient power generation would have to be made up for by auxiliary/emergency diesel generators. The auxiliary diesels would also be used to meet night requirements until adequate storage systems are available. The major problems associated with solar constructions are the initial capital cost, possibly the highest per installed kilowatt, and the area of cleared land required and used exclusively for the solar collectors.

## Wind Power

Wind power, in contrast to solar power, is almost unbounded by location. There are relatively few regions that do not have some type of wind pattern that may be exploited. Still, because of the random (or at least unscheduled) nature of winds, the lack of efficient energy storage devices limit wind-driven plants to a supplemental role. However, it has been shown that over a long run, the "supplemental" power available from the wind may be on the order of 50%-70% of the total system demand, with associated costs nearly the lowest of all the alternative energy sources.

## Geothermal Power

Geothermal generation is possibly the most fundamentally attractive alternative. This source is, however,



highly site dependent within today's technology, and requires relatively high capital costs to be reincurred periodically for re-drilling unless a first-rate, large volume reservoir is tapped initially. Utilizing the normal thermal gradient would provide only several months of operation prior to re-drilling under even the best of subsurface conditions. Costs, therefore, would vary from very competitive to prohibitive and each individual site must be evaluated (geologically) on its own merits. Technical developments in the field of innovative drilling methods could change the entire picture for geothermal power literally overnight.

#### Water Power

Until recently, low-head or run-of-the-river hydroelectric stations have not been actively considered as viable alternatives in our technology-oriented society. The simplicity of such systems can now be combined with off-the-shelf high technology components to provide power at probably the lowest cost per installed kilowatt of any system. Problems to be considered remain principally the site conditions, initial capital cost variability, and seasonal hydrologic fluctuations. The construction possibilities are numerous and at the same time

earth-moving requirements can be minimized or even entirely eliminated. There is also a large amount of work, experience, and technology available in allied fields that can be transferred to the hydroelectric generation area. In addition, if such a water-based system is feasible, it would provide one of the best regulated and most reliable continuous power sources available.

#### Thermal Power

Obviously such a system will be site specific in that a very abundant local supply of fuel must be available in sufficient quantity (or renewable) to last for the life of the project. Several plants burning timber are now operating in jungles, but costs are somewhat high due to the labor requirements to continuously supply the plant with fuel. The economics of thermal systems must therefore be very carefully considered, but the technology is already available.

#### Alternate Energy Feasibility Studies

A feasibility study to evaluate the viability of using one or more of the previously described alternative energy sources at a remote mineral industry project must consider a number of factors. Some of these factors are of a technical nature, others concern environ-

ment aspects, and many address economic considerations. The feasibility study, therefore, must thoroughly evaluate the following:

**Site.** The actual geographic site of the industrial activity will be a major factor in determining the feasibility of any given type of alternate energy construction. The regional and local climate, meteorology, hydrology, geology, and topography will all influence the outcome of this portion of the feasibility study.

**Design Criteria.** All relevant design parameters must be precisely known prior to the determination of the ability of any given alternate energy scheme to meet project requirements. Future plant or mine expansion, even if only a remote possibility at present, can be greatly facilitated if consideration is given to this aspect during the feasibility study stage.

**Costs.** Probably most important, and actually the motivating force, for the conduct of any feasibility study of alternate energy sources is the economic evaluation segment. Analysis must be made of both initial construction costs and operating costs for each "feasible" source. This is done with respect to some given base-line, most often the construction/operation costs of diesel generators operating at the desired load at the same site. One further aspect that must be considered is the necessity of including the costs of any over-capacity that may be required because of the fluctuating power levels typical of some of the alternate energy sources.

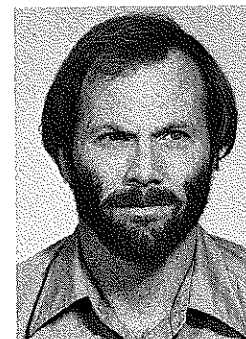
**Materials, labor, transportation.** Despite preliminary evaluations of the viability of using an alternative source, the feasibility study itself must address thoroughly considerations of material requirements, repair parts, and operating supplies. Also, the construction labor force must be evaluated with regard to skill levels required, necessary imported technical personnel, and project requirements for continued labor and skill levels during system operation. The available transportation system(s) must be evaluated for both construction period and operational suitability.

The ultimate purpose of the feasibility study is to integrate the results of all the above investigations and advance a recommendation. This recommendation is as detailed as the client requires and therefore may range from the actual design and construction requirements of the alternate energy power plant to a summary of the best options available to

the client, including vendors who can supply off-the-shelf systems that will meet his needs.

#### An Effective Solution

The authors believe that the use of alternate energy sources, such as solar, wind, geothermal, water, and thermal, to provide electrical power to isolated mineral industry sites will undoubtedly become more tenable, and perhaps even mandatory in the future as fuel prices continue to rise. While projects with short lifetimes and high rates-of-return on investment will probably not be overly affected by increased fuel costs, longer term projects with less than spectacular return will probably find the use of alternate power production systems cost effective in today's environmental and economic milieu.

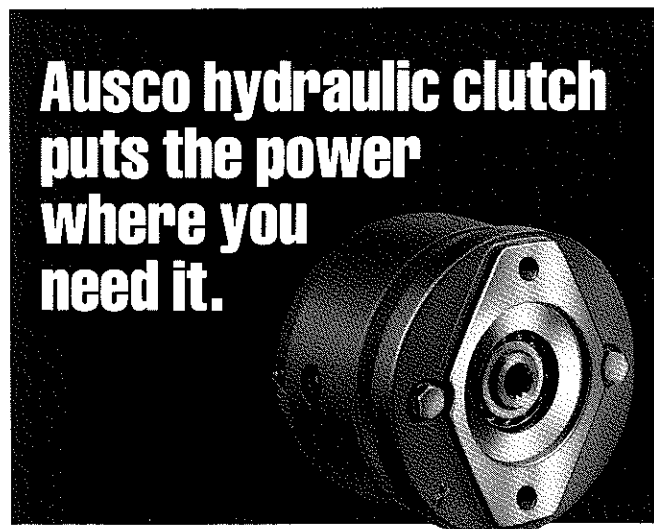


Steven M. McKenna is a 1978 graduate of the Colorado School of Mines with bachelors degrees in Metallurgy and Basic Engineering. He has been an instructor in basic engineering for the school. Currently, he is doing private consulting while working part time on his masters degree in metallurgy.



Karl R. Nelson is a 1969 graduate of the Colorado School of Mines with a degree in geological engineering. He also received a master's degree from CSM in geological engineering. After graduation he worked for W. A. Bowes and Associates as a geologist. In 1974 he returned to CSM as assistant professor of basic engineering.

He received the Brown Innovative Teaching Grant in 1978 to allow him to develop a classroom answer monitoring system, designed to enable a professor to continually assess whether students understand the material being presented.



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**Leadership.**  
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Gardner-Denver is one of those few.

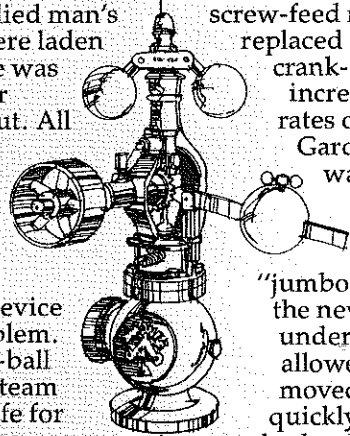
Ever since Robert Gardner established the Gardner Governor Company in 1859, our history has been one of innovation and advancement — blazing trails that others have followed, and building a reputation for engineering excellence in the process.

## Rooted in the pioneer tradition

In 1859, America was in the midst of its westward expansion. Much of the power for the booming industry of that era came from steam engines — devices which multiplied man's muscle greatly, but were laden with hazards, as there was no effective system for controlling their output. All too often, they would "run wild," tearing themselves to pieces, or even exploding!

A young Scottish immigrant, Robert Gardner, invented a device which solved the problem. His invention, the fly-ball governor, tamed the steam engine and made it safe for all types of applications.

Gardner's governors became a standard fixture on steam engines everywhere. And his company — the Gardner Governor Company — prospered and grew. As it expanded, its product line came to include air compressors and pumps of the type used in the mining industry.



## Merger with Denver Rock Drill

Also supplying equipment to the mining industry was the Denver Rock Drill Manufacturing Company — whose innovations included a pneumatically-powered hard-rock drill that could be rotated to improve performance.

The mining business brought Gardner Governor and Denver Rock Drill together on numerous occasions. Both were innovators in the field, and increasingly, the two firms found their respective product lines perfectly suited for use in combination.

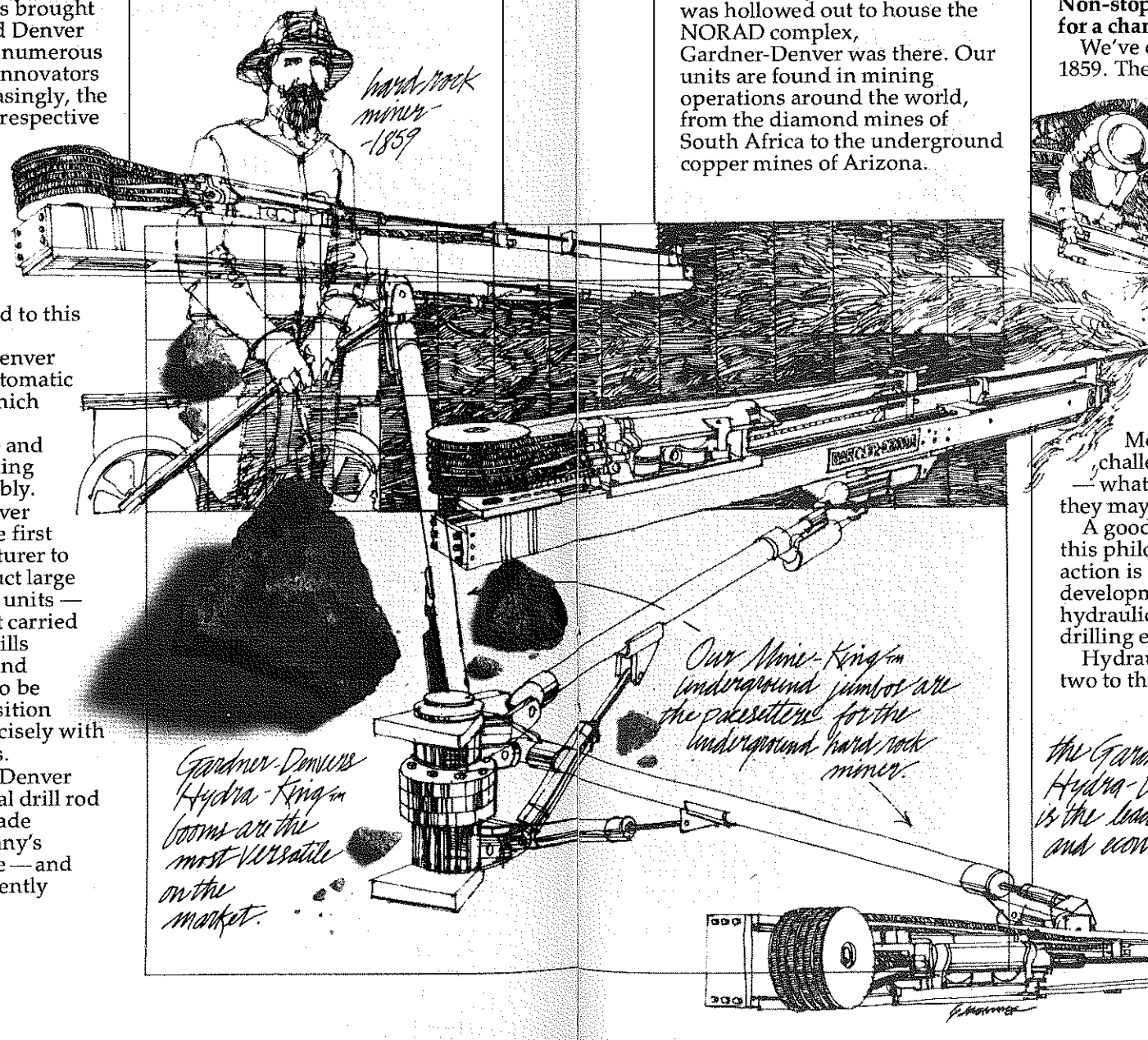
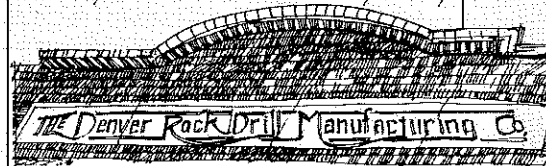
In 1927, they merged to form the Gardner-Denver Company . . . and their innovative tradition has continued to this day.

An early Gardner-Denver innovation was the automatic screw-feed motor, which replaced the hand crank-feed type and increased drilling rates considerably.

Gardner-Denver was also the first manufacturer to construct large mobile units — "jumbos" — that carried the new rock drills underground and allowed them to be moved into position quickly and precisely with hydraulic booms.

Two other Gardner-Denver firsts were the sectional drill rod — an improvement made possibly by the company's metallurgical expertise — and the original independently rotated drifter drill.

*The original Facade remains unchanged today.*



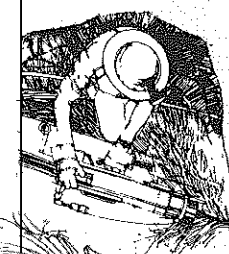
*Hard Rock Miner - 1859*

*Gardner-Denver Hydra-King in booms are the most versatile on the market.*

## Chosen for the toughest assignments

As a result of these and other innovations, Gardner-Denver has earned a reputation for leadership that led to our equipment being specified for some of the world's largest and toughest jobs.

When Cheyenne Mountain was hollowed out to house the NORAD complex, Gardner-Denver was there. Our units are found in mining operations around the world, from the diamond mines of South Africa to the underground copper mines of Arizona.



## Non-stop innovation for a changing world

We've come a long way since 1859. The years have brought a lot of changes — but in one respect, we haven't

changed at all. We're still committed to the principle of leadership through innovation.

Solving problems through a concerted application of the best skills available.

Meeting the challenges of the times — whatever and wherever they may be.

A good example of this philosophy in action is our development of hydraulically-powered drilling equipment.

Hydraulic drills are two to three times as

*The Gardner-Denver Hydra-Drill is the leader in performance and economy.*

energy-efficient as the standard pneumatic variety — not a trivial consideration, in today's energy-short world!

Our new generation of "jumbos," equipped with the latest drilling equipment, are setting the pace for today's mining industry.

To meet increased demand for these units, we've opened a new, enlarged facility in Salem, Virginia. Manager of Jumbo Development at this new plant is Chuck Milam — a 20-year veteran whose marketing and engineering experience are second to none in the field, and a man who exemplifies the innovative spirit of Robert Gardner and the other men and women who have made Gardner-Denver the company it is today.

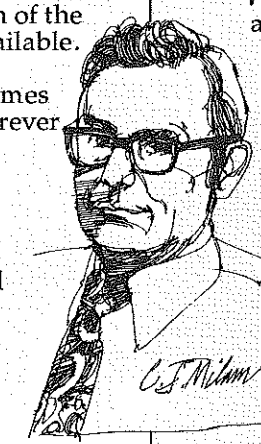
## Here today, here tomorrow

We believe that our past achievements speak for themselves. Nobody has a stronger record within the mining industry; the Gardner-Denver name is second to none.

But more important is our commitment to maintain our position of leadership.

We're in this business to stay; we have every intention of being the industry pacesetter in the next century, just as we have been in the century past.

Because that's what leadership is all about.

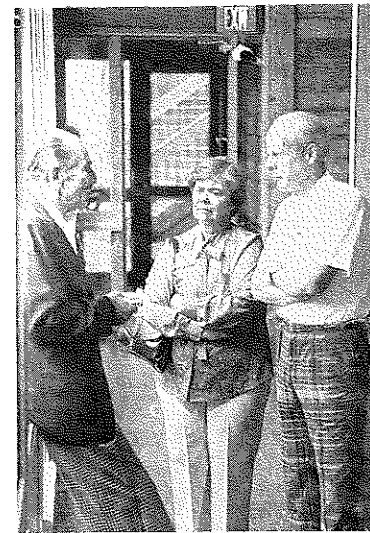


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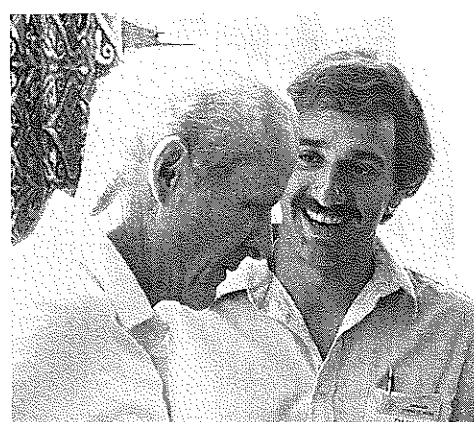
# Trustees' Summer Keystone Conference



Dr. McBride and Jan Goodrich share a relaxing moment.



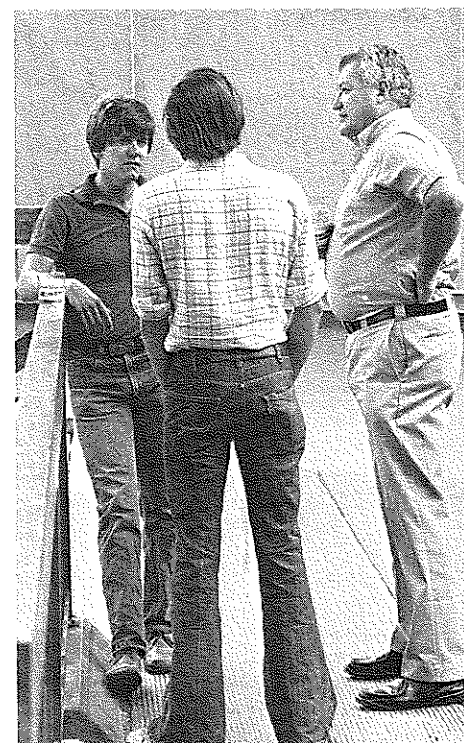
Tom Manhart, '30, Mrs. Manhart, and Bill Coors, Hon. '78, exchange views.



Bill Coors and Paul Giusti, '80, are obviously in accord here!



Martin Robbins, assistant to Dr. McBride, Jim Wilson, chairman of the Board of Trustees, and Paul Giusti seem to be deciding some issues.



Ted Stockmar, '43, board member, and Edwin Downer and Mike Sides, two of the student delegates, get acquainted.



New student trustee June Leaver listens as Jack Warren, '50, and Chuck Fogarty, '42, explain Alumni point of view.



Dr. Graham Hereford holds the rapt attention of his audience; C. W. "Bud" Leeds, Frank Schowengerdt, Bill Coors.

# Keystone Trustees' Conference

by Brodie Farquhar

Trustees, administrators, guests and a group of sixteen students from Mines gathered at Keystone, July 10-13, for an in-depth examination of "Student Life."

The presentations of "Student Life" were planned by the students, under the leadership of Paul Giusti, 1979-1980 student body president. Student life was introduced by the students in the form of lectures, skits and panel discussions, followed by large and small discussion groups.

Student life at Mines is something of a pressure cooker, according to the students. "The first semester is critical," said Mike Sides, a petroleum senior. "The competition from hundreds of high-achievers either makes you strong or knocks you out of school."

Students noted that until now, there hasn't been any system to detect the early warning signals of students under crushing pressures. "Not everyone belongs at Mines," said one student, "and not everyone should be an engineer. If they can't adjust, they should be able to go to another school with a measure of pride and self-respect left intact."

Yet things are different for those who stick it out and graduate. "Under such rigorous competition for grades, we don't have time for much recreation, for real thinking about the future, nor for emotional growth and management,"

coming alcoholics. The mythology, the culture of this school, literally pushes alcohol. We have students who, every Friday and Saturday night, drink beyond intoxication, to the point that they are sick," said Sandra Stash, a senior petroleum student and head resident of a residence hall.

"When your career is literally on the line, over an impossibly difficult or unfair test or assignment, people do desperate things—like cheating," proclaimed June Leaver, a senior geology student and student member of the CSM Board of Trustees.

When the natural pressure of course work is compounded by a few faculty members with poor teaching skills and attitudes, the pressure becomes well-nigh intolerable. "When you lose respect for a professor, you lose respect for what he's teaching. Getting through, getting the grade, not the education, then becomes all important," said another student.

"We are very jealous of our time, our investment in Mines," said Leaver. "Technical competence isn't enough. A teacher has to be able to communicate his knowledge in a form we can understand—otherwise we're trapped. A good teacher has to challenge us—help us create an excitement and enthusiasm for the subject. A good teacher tests fairly over the covered material. He doesn't condescend to students—doesn't humiliate or harass students. We are *not* children. There has to be some mutual respect," she said.

A number of the students agreed that Mines does not offer or make available enough opportunities for intellectual curiosity nor breadth of vision. "I feel like I'm being trained, not educated," said Stash.

"All this talk about pressure, survival, and stress," said CSM Trustee Ted Stockmar, "is that all there is to life at Mines? Isn't there any fun?"

The answer was yes, from all the students. Despite all the myths and horror stories about a handful of professors or departments, the 16 students all agreed that "we'd rather be here than anywhere else."

"Why, if things are so tough?" "We knew we'd really learn something if we came and stuck it out," said Olen Lund, a junior in metallurgy.

"Fun is too small a word for the excitement and intensity of life and learning at Mines," said George Saunders, a senior geophysics student.

"We have more opportunities at Mines than at a bigger school—opportunities to enjoy music, athletics, politics, without

competing against specialists," said Leaver.

Students band together in the face of all the pressure, and form deep-rooted friendships. That was vouched for by alumni guests who agreed with Stash's comment: "When you're here, you hate it. When you leave, you love it."

Obviously, the students don't want to burn Mines down, nor do they want things made easy. "We recognize the



Don Henderson, '61, special Alumni guest.

value of pressure, of being pushed to the limits of our abilities," said Saunders. They had several suggestions of how stress and pressure could be better managed, and how they would like to have a voice in rewarding good teachers and getting rid of the poor ones.

One of their suggestions had already been anticipated and implemented by the CSM administration—the creation of a counseling office on campus, staffed by Jan Goodrich.

Two more related suggestions came up which tie in with the new counseling office—peer group counseling and a campus counseling network.

## Peer Group Counseling

The students suggested that the counseling office provide dorm residents, the Greeks, student leaders and interested students with counseling and related listening skills. This "peer" group would then act as an outreach arm of the counseling office, able to recognize the symptoms of stress in their fellow students before they reach the crisis stage.

## Campus Counseling Network

According to Dean of Students Michael Nyikos, a campus counseling network would tie the whole campus system into student counseling—staff, faculty, and administrators. "Students will find their own entry point into a counseling network—a security guard, a secretary, a professor or an administrator in Guggenheim—someone they feel they can talk to. If we're all aware and sensitive to the needs and problems of students, we can help them ourselves,



Joanna Sixta, student participant.

said Russ Roundtree, a senior in geophysics. "Everyone lives and studies on the brink, constantly under high stress," he said.

Alcohol abuse and cheating are two ways that students mishandle the pressure and stress. "We have a lot of students who are well on their way to be-

or refer them on to the counseling office," said Nyikos.

The students had a number of other observations and suggestions to make, as follows:

#### Faculty Advisory System

Some students never see their faculty advisors, although some faculty genuinely care. Others are not interested in academic counseling. The current system could be augmented with student access to a computer, which would advise students of course requirement changes, availability of classes and options in scheduling.

For faculty interested in academic counseling, the students suggested that they be recruited, along with interested upperclassmen and women, into the campus counseling network.

#### Alcohol Abuse

The students proposed that an alcohol abuse program be established on campus. Based on their preliminary research, they cited the University of Florida as a school with an effective program. There, students have organized an active Alcoholics Anonymous group, set up an Alcohol Counseling Group, and conducted an extensive publicity campaign.

The CSM students also proposed to debunk the myth of the hard-drinking Mines student with posters, discussion groups, special programs and plenty of soft drinks at campus functions.

#### Class Structure

Currently, the students noted, class structures for freshman and sophomores do not allow much room for exploring interests in minor fields of study, such as mineral economics, environmental science, or the humanities. Students recommended the addition of a humanities class in freshman schedules focusing on public affairs and communication skills.

#### Grades

Students are not satisfied that the grades of A, B, C, D, and F give enough detailed information to prospective employers. They expressed a desire to get away from "grade-mania." One alternative would be a dual system, showing the letter grade and the points accumulated in the class. The students argued that the instructor would still be able to establish the cut-off points for letter grades, while the student would have solid evidence of being very close to a higher grade.

#### Foreign Students

Virtually everyone agreed that foreign students at CSM are a valuable, untapped asset. Students, faculty and guest alumni all agreed that past or current graduates are seriously ill-prepared

to deal with foreign cultures, languages, and politics. Foreign students and alumni with foreign experience could provide valuable insights on foreign work assignments.

#### Faculty Evaluations

Neither the students nor the administration are happy with the current status of faculty evaluations by the student body. President McBride reported that he still hasn't seen the student evaluations from last spring. The students themselves criticized evaluation forms as being superficial, and noted that

some of the teachers they complain most about will not allow themselves to be evaluated.

The pressing need for improved faculty evaluations was highlighted by the comment that segments of the mineral and energy industries will not hire CSM graduates, if the students had certain professors for particular courses. Why? Industry questions the competence of one or two professors, in terms of their ability to effectively communicate technical subject matter.

Several suggestions emerged. One, to have a group of students advise Dr.

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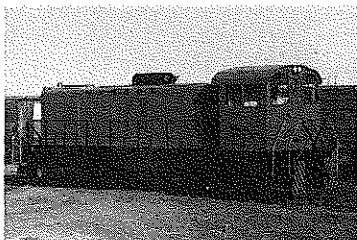
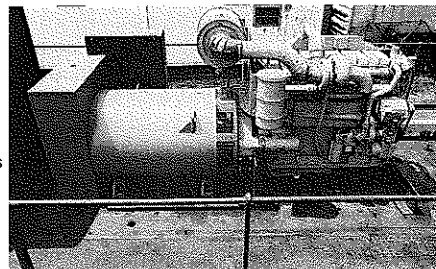
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Mueller, vice-president of academic affairs, on the development of a new student evaluation form and procedure. Another, to have the student council conduct the evaluations, publish the results in the student paper and counsel department heads on how poor teachers could improve.

"The task is formidable," said Graham Hereford, the new head of the CSM humanities department. "The question is whether students can compile objective evidence on faculty performance. The whole issue of faculty evaluation is difficult to understand even with 50 years of experience."

"I firmly believe that students are entitled to be taught, and students have a responsibility to learn," said Trustee Ted Stockmar. "The burden rests on both faculty and students," said Leaver.

#### Spiking

The generally accepted definition of spiking, is getting help from another student on a difficult homework assignment. Abuses creep in when students make a "cold spike"—copying someone's homework, without actually working the problems in an effort to understand the assignment.

The students pointed out that spiking, cold spiking, and cheating usually take place when the homework becomes an

overload. Spiked classes are usually outside a student's major discipline.

Students and trustees eventually agreed that students studying together can be a learning experience. Cold spiking and cheating are simply self-destructive.

Several ideas emerged from the conference. The students suggested that faculty clarify whether collaboration on homework assignments was acceptable. The students also suggested that Mines re-examine the Honor Code and emphasize professional ethics. President McBride suggested that the faculty consider in some courses a policy of "no credit on homework, but no final grade without all homework turned in," he said.

A number of other topics and issues came up for discussion; ethics, research and development, stress management, situation seminars, energy and mineral policy formulation and the question of how to define quality education.

It all boiled down to three questions for Colorado School of Mines. How will CSM find the balance between technical competence and the mature well-being of the whole person? How can CSM keep up the pressure on students that produces good engineers, yet help stu-

dents deal with the destructive aspects of that pressure?

What expectations must Mines fulfill, in order for the new financial plan to be judged a success?

As pointed out by John Welles, vice-president for planning and development, the new financial plan makes the trustees responsible for producing quality education at Mines, setting and keeping the tuition, all on a trial basis from the Joint Budget Committee of the State Legislature. Failure to meet expectations of the JBC, trustees, students and parents, faculty and administration, alumni and industry means failure of the plan and risk of considerable damage to Mines itself, Welles noted.

Most of the expectations revolved around definitions of high-quality programs, teachers, students and education. Said Trustee Jim Wilson, "I think that we have a very special responsibility to refine our understanding of the ingredients in this educational excellence that exists at this campus and in that process to aggressively shore up the weak spots, and clearly there are some. We can't assume the meaning of excellence. We've got to sharpen our understanding."

—mm—

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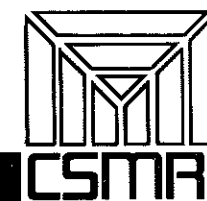
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## alumni update



**Santiago Urteaga as 1920 student**

'20 **Santiago Urteaga, E.M.**, recently sent a few pictures to share memories of his time at Mines. Now 87 years old, he resides in Monterrey, Mexico.

'40 **Walter E. Heinrichs, Geol.E.**, attended his 40th reunion during Commencement festivities at the School last May. Walter, a valued friend of CSMAA, stopped by the Alumni office during his visit.

'42 **Ward O'Malley, E.M.**, wishes to pass on this note to his classmates: "Chuck Fogarty stopped by Golden, Tipperary with his wife and friends last week. The Fogarty clan used to own north Tipperary about 400 years ago. There are still many Fogarty families near Thurles, the county seat."

'43 **William M. Aubrey, Jr., Met.E.**, has retired as chief metallurgist in the mining department of Bethlehem Steel Corporation after 32 years service. Aubrey published several technical papers and holds a number of patents dealing with minerals beneficiation. He was involved in the laboratory testing, plant design and start-up of beneficiation installations in Mexico, Canada, Brazil, Chile, Sierra Leone, and Liberia, as well as the United States. Mr. and Mrs. Aubrey will continue to reside in Bethlehem, PA. **Douglas Ball, P.E.**, served as Co-chairman of the Tar Sands Subcommittee during the mid-year meeting of the Interstate Oil Compact Commission held last June in Vail, Colorado. **Thomas H. Cole, E.M.**, announces the formation of UCO Inc., a new company that will mine coal in Colorado, New Mexico, and Utah. The office is located in Denver. **Robert P. Davison, Geol.E.**, is currently both a partner in The Telluride Times and counsel for Holland and Hart.

'48 **Dean F. Thorpe, Met.E.**, is currently a Corporate Projects Manager for Madison



**Dan E. Nisley**

Industries, Inc. in Highland Park, NJ. **Dan Nisley, Geol.E.**, has been promoted to manager of onshore exploration for Conoco Inc.'s North American petroleum operations. He was formerly manager of operations-southern division in the North American exploration department. **George W. Bachen, Geol.E.**, is now a consultant for the First Energy Corporation of Mississippi.

'50 **James S. Hastings, Geol.E. and MSc. Geol.** '58, has joined the Gulf Mineral Resources Co. in Denver as manager of uranium exploration for the Gulf Oil Corporation division. He was formerly vice president for minerals with Coastal Corporation. **Howard W. Leaf, Geop.E.**, has moved to the Pentagon in Washington, DC, as Inspector General, USAF, from Kirtland Air Force Base, New Mexico, where he was head of the operational test organization.

'52 **Don Adams, P.E.**, is president of Petroleum Operations Inc. He is former project engineer for Completion Technology, Co. **John P. Lockridge, Geol.E.**, was

convention general chairman and master of ceremonies for the American Association of Petroleum Geologists Awards Luncheon held June 9 in Denver. Henry Kissinger was featured speaker of the convention, largest event in AAPG's history. **Robert L. Burch, Geol.E.**, who was formerly vice president-natural resources group for Banner Petroleum Corporation, is now executive vice president of the same company. **Roger A. Hitchins, II, E.M.**, has retired as plant superintendent, Van Dyke plant, Kaiser Aluminum and Chemical Co.

'53 **Willis Leon Dotson, Met.E.**, is currently plant superintendent for Minas San Cristobal in El Salvador, but has been filling in as acting manager since August, 1979. **James R. Bingel, Geop.E.**, is a process engineer for United States Steel, Texas Uranium Operations. He was formerly with Minntac Concentrator as a metallurgist.

'54 **Philip H. Halstead, Geol.E.**, formerly exploration manager with Statoil in Norway, is now a geologist/geophysicist for Halstead Exploration Inc., in Golden. **Donald O. Rausch, E.M., DSc.** '59 and Medalist '78, has been promoted from executive vice president of Western Nuclear Inc. to president and chief executive officer of the same company.

'55 **Harry M. Conger, E.M.**, was quoted in an article on the rise and fall of gold and silver prices in the June 9 issue of FORBES magazine. Conger, president of Homestake Mining, said about the future of the market, "We think the long-term trend for gold and silver prices will rise equal to or faster than inflation." **Frank K. Gibbs, Geol.E.**, has been elected vice president-exploration for Coseka Resources (U.S.A.) Limited, Denver. Gibbs, who joined Coseka in 1978 as an exploration manager, will be in charge of all exploration activities. **Robert J. Hohne,**

**Paul M. Hopkins, '39**  
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Robert J. Hohne

Geol.E., has been named vice president, gas supply, for Southern California Gas Co. He was formerly with Pacific Lighting Service and Supply Co. as an economic analysis manager.

'56 H. Boyd Moreland, E.M., has opened a practice in all phases of petroleum engineering with emphasis on reservoir engineering, oil and gas property evaluation, reserve estimating and auditing, and individual well producing problems. He is located in Casper, Wyoming. William C. Penttila, Geol.E., is now chief geologist for Weeks Petroleum LTD. in Westport, CT. Robert N. Schnepfe, Geol.E., formerly senior geophysicist for Conoco Inc. in Denver, has been promoted to Director of Geophysics for that company.

'57 Robert L. Stansbury, P.R.E., who was formerly manager of materials for Information Handling Services, is now vice president-manufacturing for Gates and Sons, Inc. Norman E. Goldstein, Geol.E., is group leader for all Lawrence Berkeley Laboratory's geothermal projects including exploration tech-

nology, reservoir engineering, energy conversion technology and environmental research. He was nominated for 1980-81



Norman E. Goldstein

executive committee vice president of the international Society of Exploration Geophysicists.

'58 Richard W. Volk, P.E., has combined his engineering experience with a degree in law from the University of Denver, to become president and chief executive officer of Energy Reserves Group in Wichita, Kansas. He explained in the April 1980 issue of The University of Denver News, "Although I was one of the youngest applicants, the board felt I could handle the position. The company had engineering and legal problems, so I guess they thought I was the one best qualified." Three years after Volk assumed leadership, the company was out of trouble."

'60 Thomas M. Carroll, P.E., was promoted by the Denver-based Worldwide Energy Corporation from production engineer to manager of U.S. production and drilling.



George Rathbun

'61 George R. Rathbun, Geol.E., has been appointed director of coal resources for Phelps Dodge Corporation. He will be evaluating the company's coal properties for mining potential. Joseph F. Fisher, E.M., formerly consulting engineer for James A. Hamilton, Inc., is now general manager for Northland Gold Dredging, Inc. George S.

Dennison, E.M., has joined Hazen Research, Inc. as senior project engineer. His concern is process engineering associated with the metallurgical and chemical industries.

'62 Allan G. Provost, E.M., presented a technical paper on shaft sinking and tunneling during a Mining Technical Exchange Seminar in Beijing, China, last June. Provost said of the exchange, "This may lead to a considerable amount of trade between our mining industry and China's. The Chinese are very interested in technologies and products that may be used to develop their vast natural resources." John D. MacFadyen, Met.E., project manager at Bendy Engineering Co., has been elected chairman of the St. Louis section of the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers. Thomas C. Aude, E.M., of Pipeline Systems Incorporated, will be one of two instructors at a September seminar on slurry pipeline hydraulics and design for coal and mineral ore. Charles W. Downing, P.R.E., has been named project engineer for Rio Grande Oil Shale Co.'s demonstration of the Lurgi-Ruhrgas surface oil shale report.

'64 Vernon A. Isaacs, P.E., formerly executive manager-acquisitions, is now vice president-property acquisitions for Petro-Lewis Corporation.

'65 Allen C. Randle, P.R.E., has been promoted to vice president, oil shale operations, Union Oil of California. He was a process engineer for the same company, prior to this.

'66 Charles Ju-Wu Han, MSc.Min., has become senior staff mineral analyst for Exxon Minerals International in Texas. He was formerly with Phelps Dodge Corporation as senior financial analyst.

'67 John J. Antony, Geol.E., is manager for Denison Mines U.S. Inc. based in Denver. Garry Nollen, P.E., formerly an operation engineer for Altex Oil, is now an engineer for Dyco Petroleum Corporation.

'68 Ramon S. Pizarro, MSc.Met., is currently in Manila, Philippines working for Atlas Consolidated Mining and Development Corporation, and hopes "1980 turns out to be a successful year for all miners around the world." Jack R. McClellan, P.E., has been appointed operations superintendent, Oregon Basin, for Marathon Oil Company. He was formerly operations engineer in the Anchorage production division of Marathon. Robert L. Pearson, Geop.E., was the featured speaker at the Denver Coal Club meeting in June. Pearson is administrator-environmental affairs for the Public Service Company of Colorado.

'69 Mike Richardson, Geol.E., is now mine evaluation engineer for Climax Western Operations in Black Hawk, Colorado. Robert J. Duerloo, E.M., is general manager for Spring Creek Coal Co. in Wyoming. Craig Earl Moore, Geol.E., has been appointed chief geophysicist for Trinity Resources, Inc. in Houston, Texas.

'70 Terry J. Laverty, E.M., has transferred to Houston, Texas as operations staff engineer for Exxon. He was previously located in Wyoming as surface mine superintendent at the Highland Uranium mine. Thomas A. Sladek, MSc.CPR and PhD.CPR '71, has been named Director of the Energy Division at the Colorado School of Mines Research Institute. He has been with CSMRI since

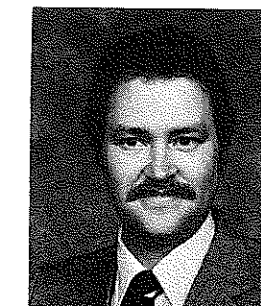


Thomas A. Sladek

1974 except for a one-year leave of absence when he directed an oil shale study for the Congressional Office of Technology Assessment in Washington, D.C. Craig L. Garrett, BSc.Met., is currently manager, liquid-solids separation equipment, Denver equipment division, Joy Manufacturing Co.

'71 Craig W. Moseley, BSc.CPR and MSc.CPR '73, is now process engineer for Gulf Mineral Resources Co. in Denver.

'72 Skip Arnim, BSc.Pet., has moved from Singapore to Perth, Australia where he is senior engineer for Phillips Australian Oil Company. He visited the School in Golden while on vacation with his family. Guy T. McBride, Jr., Hon.Mem., was elected to the Texasgulf Board of Directors. Robert G. Cuffney, BSc.Geol. and MSc.Geol. '77, assigned to the Denver exploration headquarters of Exxon Minerals Company, USA, has been promoted to professional geologist for his work in uranium exploration.



Terry L. Grap

'73 Terry L. Grap, BSc.Met., has been named district sales manager-aggregate industry for the Process Machinery Division of Rexnord Inc. in Atlanta, Ga. He was formerly sales engineer for the Denver Equipment Division of Joy Manufacturing Co. Richard A. VanHorn, E.M., is mining engineer-exploration and resource development for Union Carbide Corporation. Thomas K. Tulk, BSc.Math, MSc.Math '74 and PhD.Min.

Econ. '78, formerly manager-operations research for Stearns-Rogers Inc., is now director-resource assessment and development for the Council of Energy Tribes. John B. Place, Hon.Mem. and Hon.D.Engr., is now president of Crocker National Bank in San Francisco, California.

'74 Richard G. LaPrairie, BSc.Min., is currently a mine engineer for Noranda Mining Inc.-Ontario Project in Park City, Utah.

'75 Matthew A. Thiel, II, BSc.Min., formerly mine engineer with National Potash Co., is now project coordinator of the Ertzberg East Expansion at Freeport Indonesia's Copper Operations in Irian Jaya, Indonesia. William R. Reitze, BSc.Min., has been appointed senior mine operating engineer at U.S. Steel's Somerset Coal Mine. He has been with U.S. Steel since his graduation. James R. Perry, BSc.Min., has moved from Freeport Phosphate Rock Co. as a mineral engineer to Schlumberger Well Services as a field engineer. Todd Rounding, BSc.Pet., has been promoted from petroleum engineer-senior grade to senior engineer for Amoco in Denver. Roland A. Connors, MSc.Geol., formerly of Group Seven, is now a geologist for Barringer Research, Inc. in Golden.

'77 Deborah R. Miles, MSc.Geop., formerly a geophysicist with Chevron U.S.A., is now self-employed as a geophysical consultant in Boulder, Colorado. Lynn M. Murphy, BSc.CPR, is now a petroleum engineer for United Bank of Denver. Murphy was previously with Amoco Production Company as a petroleum engineer. Paul D. Schiefelbein, BSc.CPR, who was formerly with Procter & Gamble as a staff research engineer, is now a process engineer for Gulf Oil Chemicals Co. John C. Patton, BSc.Min., is currently senior mining engineer for the Salt River Project in Phoenix, Arizona. The project is a political subdivision of the State of Arizona, providing electric power and energy to more than 300,000 residential, commercial, industrial and agricultural retail customers in the greater Phoenix metropolitan area and several mining customers in portions of East Central Arizona. Kevin D. Norman, BSc.Phy., formerly with Bear Mt. Think Corp.

as a consultant, is now in California as a consultant to Aero Power Systems Inc.

'78 Frederick N. Williams, BSc. Phy., recently left Combustion Engineering for a new position as shift technical advisor at Yankee Atomic Electric Co.'s Yankee-Rowe Nuclear Power Plant in Rowe, Mass. Joseph Kuchinski, BSc.CPR, is with Phillips Petroleum Co. as a process engineer. He has been with Phillips since his graduation. John J. Button, BSc.Geop., formerly a geophysicist with Texaco Inc., has moved to Amoco Production Co. as a petroleum geophysicist. Daniel E. Lowe, BSc.Geol., is a reservoir engineer for Husky Oil Co. He was a petroleum engineer for U.S.G.S. Conservation Division. George E. Newman, BSc.Min., is senior business coordinator for Petro-Lewis Corporation in Denver.

'79 John A. Falk, BSc.Geol., has moved from Duval Mining to Ideal Cement as an exploration geologist. Eloise Montoya Nelson, BSc.Met., is currently involved in a training program at Inspiration Consolidated Copper Company. Carole Ann Johnson, BSc.CPR, has become an engineer for Atlantic Richfield in Twiley Park, IL. Timothy L. Hoops, BSc.Geol., formerly with Cities Service is now employed by Amoco Production Co. Thomas F. Buchholz, BSc.Min., is now a mine superintendent for Martin-Trost Associates. He was with Molycorp as a production foreman.

'80 Norman D. Hinman, MSc.CPR, has been employed by Gates Rubber Co. as a forecast coordinator. William R. Micale, BSc.Pet., has joined Tenneco Oil Exploration and Production as a production engineer in the Rocky Mountain Division in Denver. Russell C. Fontaine, BSc.Geol., is temporarily located in Michigan as the lead geotechnical engineer for the epoxy injection program at Victoria Dam.

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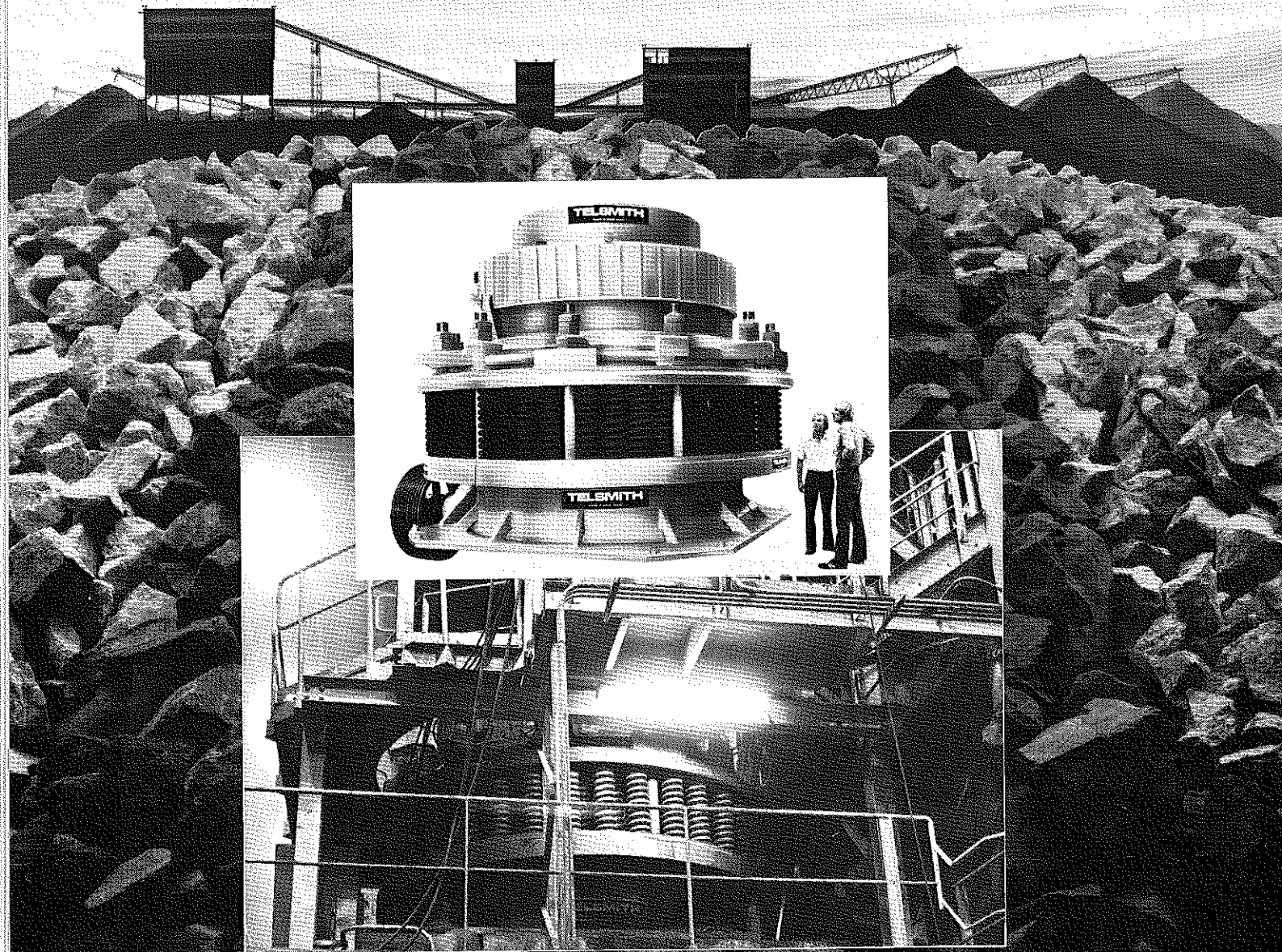
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## New CSMAA Director

Colonel (Ret.) William E. Leckie, MSc. Min. 1949, has been appointed Executive Director of the CSM Alumni Association, effective September 1. He replaced George W. Mitchell, Jr., '53, who resigned to accept employment in private industry.

Colonel Leckie is well known to the CSM community through his work on campus as an Associate Professor in the Mining Department and many administrative positions. He has worked as assistant to the Vice-President, Academic Affairs, assistant to the President, and, for more than 12 years, director of continuing education for the School.

Prior to this employment at CSM, Leckie served 26 years in the U.S. Army Corps of Engineers.

The new Executive Director will oversee the growing services of the Alumni Association office, including continuing

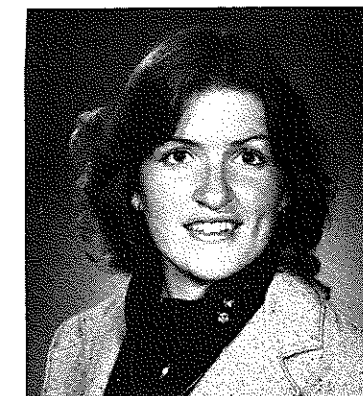


Col. William E. Leckie

education; placement; records maintenance; alumni affairs and publication of the MINES Magazine.



## New Publications Associate



Kathleen B. Johnson has joined the MINES Magazine staff as Publications Associate.

A native of Missouri, she is a 1980 University of Missouri—Journalism School graduate with an emphasis in advertising and writing. In 1979, she in-

terned with E.D.S. Federal Corporation as a technical writer responsible for the company newsletter.

During her college years, Mrs. Johnson was an active campus leader. She served as president of Mortar Board National Honor Society, historian/reporter for Zeta Tau Alpha sorority, senator in the student government, and campus coordinator for the Red Cross.

She is a member of Kappa Tau Alpha, an honorary journalism fraternity, Women in Mining, and Business and Professional Advertising Association.

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# LOOKING TO 1981

With the selection of a chairman of the Nominating Committee by the Board of Directors President each year, a new process of selection begins for Board members. The process is challenging, sometimes frustrating and often interesting. It is immensely important to the CSM Alumni Association, providing as it does the leadership for the organization and guaranteeing continuity of programs and services.

Three former Board Presidents; Bob Brace, Art Meyer and Don Craig, have shared some impressions of their stints as Board members with MINES Magazine. They are concerned that the high quality of the Board to date be maintained and that the members of the Association have a good working knowledge of how directors and officers are chosen.

Bob Brace '49, has this to say, "It is an enriching privilege and honor to serve the Alumni Association in this manner. It is, however, in spite of the fact that we number over 9,000 living alumni, not always easy to find those who are able to be candidates for a Board position." Brace points out that there are three Directors and four officers to be elected this year, who will begin to serve in

January, 1981. He has also made available those portions of the By-laws of the Association which apply to the Directors and the officers. Once an alumnus has been elected to the post of Secretary to the Board, the assumption is made that this person will continue to serve, through the Presidency. The by-laws state:

## ARTICLE III Directors

Section 1. The affairs and management of the Alumni Association are to be under the control of a Board of Directors of eleven members consisting of the President, the Vice President, Secretary, and Treasurer of the Alumni Association, and seven other directors, who shall be elected to serve for three years.

Section 2. The Board of Directors shall have full power and authority under the Certificate of Incorporation to do all acts and perform all functions necessary to carry out the purposes for which the Alumni Association has been organized. It shall review the President's appointments to the standing and special committees. The Board shall adopt a policy for the Alumni Association to follow. It shall be the final authority in determining what expenses the Alumni Association shall incur.

Section 3. The chairmen of all standing committees of the Alumni Association who are not elected members of the Board of Directors shall be advisory, nonvoting members of the Board of Directors, and they shall advise and assist the voting members of the Board of Directors in the conduct of the affairs of the Alumni Association.

Section 4. The Board of Directors may, at its discretion, appoint an assistant secretary and/or an assistant treasurer and may outline their duties. They shall be advisory, nonvoting members of the Board of Directors.

The Board of Directors shall have the power to select and hire an Executive Director from the membership of the Alumni Association and fix his salary.

The Board of Directors shall have the power to employ such help as needed to carry on the work of the Alumni Association.

In no case can the Board of Directors employ or appoint anyone to serve for a longer period than until the next annual meeting when a new Board of Directors is elected.

Section 5. Any vacancies occurring during the year in any of the elective offices shall be appointed by the President with the approval of the Board of Directors. Such appointee shall serve only until his successor is elected at the next annual meeting. In case of a vacancy in the office of President, the Vice President shall become the President.

## ARTICLE IV Officers

Section 1. The officers of the Alumni Association shall be a President, Vice President, Secretary, and Treasurer, all of whom shall be active members of the Alumni Association and shall be elected at the annual meeting for one year. All officers shall serve until their successors are elected and qualified according to the Bylaws. There shall also be an Executive Director selected and hired by the Board of Directors as provided in the Certificate of Incorporation.

Section 2. The duties of the President shall be to preside at all meetings, announce business, put all motions, decide tie votes, appoint the members of standing or special committees, make other appointments as provided in the Certificate of Incorporation, and be Chairman of the Board of Directors.

Section 3. The duties of the Vice President shall be that of the President in his absence or inability to act.

Section 4. The Secretary shall keep a record of the proceedings of the Alumni Association and shall perform such other duties as may be assigned to him by the Board of Directors.

Section 5. The Treasurer shall have the responsibility for: Collecting all dues and accounting for all moneys, keeping a record of the finances of the Alumni Association, depositing all funds of the Alumni Association in a bank or other depositories to be chosen by the Board of Directors. The Treasurer shall authorize a yearly audit of the finances and report same to the Alumni Association at its annual meeting. He shall be Chairman of the Budget and Finance Committee.

## ARTICLE V Election of Officers and Directors

Section 1. The nominating committee shall canvass the membership and place in nomination one or more candidates for each elective office of the Alumni Association.

Section 2. Ballots containing the names of the candidates placed in nomination by the Nominating Committee shall as far as possible be mailed to each active member of the Alumni Association at least 30 days before the date set for the Annual Meeting. Each ballot, after it has been properly voted, shall be placed in a sealed envelope to be opened only by the tellers, who shall be appointed by the President with the approval of the Board of Directors. The tellers shall count the ballots and shall certify as the elected officers, the candidates who have received a majority of the votes cast for each office. In case of a tie vote, the outgoing Board of Directors shall cast a vote to decide the election.

Don Craig, '48, has set forth some criteria for candidates which reflects his experience over his tenure with the Association. Craig and Brace both serve as CSMAA representatives on the CSM Foundation Board of Directors, as past presidents of the Association. Craig feels that the alumnus who wishes to be a candidate for the Board and possibly later for an office should have a genuine

concern for maintaining and advancing the quality and reputation of the School of Mines graduates. He says, "The Board represents all of the graduates of Mines, who are scattered throughout the world, are engaged in many different occupations and embrace a wide range of ages. I believe that there is great strength in reasonable diversity. Prospective Board members would find helpful such skills as the ability to read and understand financial statements; experience in management and personnel relations; organizational skills; a good working knowledge of investments—and a good sense of humor!"

These statements are reinforced by Art Meyer, '50, who points out that an alumnus, planning to stay on the Board through a directorate and as an officer, should keep in mind that he is dedicating a portion of his time for seven years to the Alumni Association. According to Meyer, "Most of us feel that we have gained from graduating from CSM, and would like to reciprocate by aiding the Alumni Association and the School. Board members need not be from only the Denver area—people from all over the country can be involved and participate." He points out that the rewards of serving on the Board justify the expenditures of time, effort and money involved.

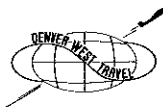
"Associating with old friends, making new ones, the great feelings of accomplishments, and lessons learned from failures make the effort worthwhile. I believe in the old adage, 'You get out what you put in,' " he says. "As a past President of the Alumni Association, I feel as though I am a member of a very elite group."

Brace is determined to recruit a slate of competent, committed candidates for the ensuing year. To this end, he urges all alumni interested in serving the Association to contact the CSMAA Nominating Committee, care of the CSMAA office, Golden. Committee personnel to assist the Board, and candidates for directors and officers will be given every consideration. The ballots for voting on these people will accompany your membership renewal. If there are members of the Association, a requirement for holding office, who feel that they want a voice in the future of the Alumni programs for the next several years, or if anyone has knowledge of a potential candidate, please do let your Association officers and the committee know as soon as possible. Your participation in each aspect of the Association is the key to making it work.

—mm—

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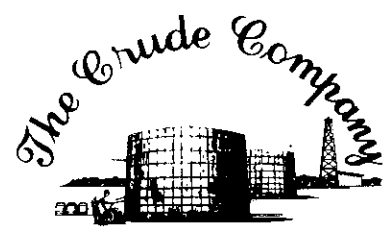
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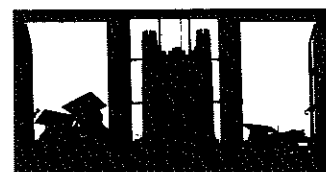


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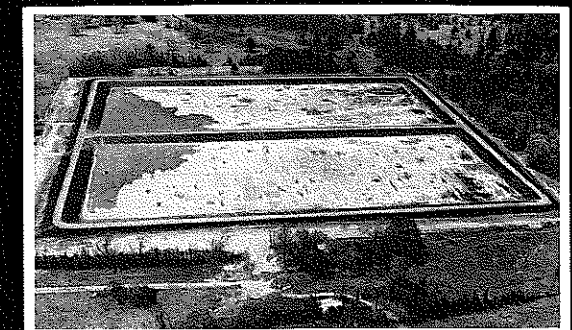
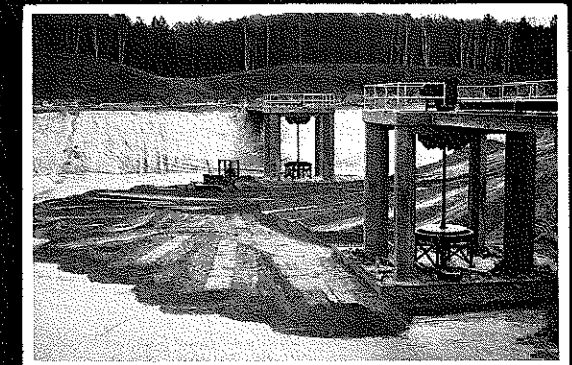
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# HOMECOMING

## COLORADO SCHOOL OF MINES

### HOMECOMING 1980

Friday-Saturday, October 24-25, 1980

### Schedule of Events

#### FRIDAY, OCTOBER 24

All Day—	Alumni Registration	Alumni Office
Noon	Introduction of Queen & Best Candidates	Guggenheim Steps
Noon	**Quarterback Club Luncheon— The speaker will be a well known Colorado Sports personality	Green Center
2:00 p.m.	Campus tours—for interested alumni	Start—Green Center
4:00 p.m.	Student Chicken Dinner & Entertainment (Alumni welcome)	To be announced
6:30 p.m.	**Alumni Cocktail Party—CASH BAR	Holiday Inn West
6:50 p.m.	Noise parade, featuring the Mines Band (Alumni welcome to participate)	Green Center
7:00 p.m.	Pep Rally & Team Introductions (Alumni welcome to participate)	Meyer Commons
7:45 p.m.	**All-Alumni Banquet—spouses & guests welcome—A brief program with Coach Marv Kay, '63, introducing the football captains. The reunion classes of 1960, 1965 & 1970 will hold their class gatherings at this banquet.	Holiday Inn West

#### SATURDAY, OCTOBER 25

10:00 a.m.	Homecoming Parade	Downtown Golden
11:15-12:45	**Alumni Luncheon—Immediately after parade—FEATURING Alumni Beer Chugging contest.	Integral Club (Student Center)
1:00 p.m.	Kick-Off—Mines vs. Western New Mexico University	Brooks Field
4:00 p.m.	Alumni Homecoming Reception—CASH BAR (Immediately after the game)	Fireplace Lounge
6:00 p.m.	Fraternity Dinners—Alumni invited	Frat Houses
8:00 p.m.	Student Homecoming Dance—Alumni invited	Friedhoff Hall

\*\*Reservations should be made in advance by completing the form below and returning it with your check, payable to the CSM Alumni Association. We ask your cooperation in making advance reservations.

### RESERVATIONS

HOMECOMING — 1980

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	No. of Tickets	Total
Quarterback Club Luncheon, Friday	_____ @ \$ 4.00 ea.	_____
Alumni Banquet, Friday (CASH BAR)	_____ @ \$11.50 ea.	_____
Alumni Luncheon, Saturday	_____ @ \$ 4.00 ea.	_____
Football Game, Saturday	_____ @ \$ 3.00 ea.	_____
TOTAL =		_____

Enclose Your Check (made to CSM Alumni Association) and This Form and Mail Today:

CSM Alumni Association, Golden, CO 80401—(303) 279-0300, ext. 2290.

### Still in the Running

On Saturday, June 7, 1980, Jack Pardee, E.M. '36, successfully defended his over-60 division title in the fourth LeRoy Bearman Memorial Run held in Albuquerque, New Mexico.

"I did better than I thought I would," the 67-year-old Pardee admitted. He completed the four-mile run in 27 minutes, 35 seconds. That was only seven minutes behind the man who finished first overall.

A retired mining engineer for the U.S. Forest Service, Pardee ran in high school in Georgia and at the Colorado School of Mines, but says he was "mediocre."

Two decades ago he decided to take up running in earnest. He now runs four miles a day, lifts weights three times a week, and rides an 18-mile bicycle tour of Albuquerque several days a week.

When asked if he thought of running marathons, Pardee replied, "Whenever I get that kind of urge, I just lie down awhile and wait for it to go away."

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### under the "M"

### Coal Mining Institute

Colorado School of Mines' Dean of Students, Dr. Michael S. Nyikos, participated recently in the 75th Annual Rocky Mountain Coal Mining Institute, held June 30 and July 1 in Vail, Colorado. Nyikos' talk focused on what CSM is changing in its curriculum, to meet the changing needs of the mining industry.

The theme of the institute's program was "Solutions to Problems." Among the topics were Federal regulatory policies and impacts, markets for Western coal, OSM permitting problems, coal transportation, coal liquification in South Africa and more.

CSM graduates were prominent among the 300 to 400 participants at the institute. Ed Ziolkowski, '53, vice-president of Energy Development Company, was elected the new president of the institute. Thomas Young, '52, of Wyoming Fuel Company, was one of the program chairmen.

### New Coalition Director

Dr. Robert Trent, a member of the Mining Department staff at the Colorado School of Mines, has been elected to the Board of Directors of the Coalition for Responsible Mining Law.

In a move to expand the board from 17 to 21 members, Trent was one of four newly elected directors.

The Coalition is a non-profit organization established in 1979. It was founded to provide information on the General Mining Law and attempts to revise the Law.

If you have any items dating back to 1880 which could belong in an early assayers or mineralogists office, the Mines Museum wants them.

Since the Museum was recognized as early as 1880 in the Mines Catalog, 1980-81 has been set as their Centennial Celebration. The Museum staff will be exhibiting an early assayers and mineralogists office complete with all the "tools of the trade"—gold scale, books, molds, weights, microscopes, letters. . . .

Any information regarding such items should be directed to the Museum so that they may prepare the exhibit and special open house to be held in May during commencement.

The first contribution, a gold bullion balance and some assayers molds, came from Charles O. Parker, E.M. 1923.

### WHO ARE THESE MEN?



Underground at Homestake Mines, Lead, South Dakota in 1932—the engineers from CSM! We've identified Professors Signer, Carpenter and Underwood. Any help we can get on the others?

### Hereford New Humanities Head

The new Head of the Department and Professor of Humanities and Social Sciences at the Colorado School of Mines is Dr. Graham Hereford.

At this summer's Trustees' Conference at Keystone, Hereford described his role as the department head: "I hope to establish a bridge of understanding between Humanities and the other departments. In particular, as this conference has pointed out, students and faculty need to be aware that the concepts found in Humanities can be very useful in the professional, outside world."

Dr. Hereford earned his degrees at the University of Virginia. They include Chemical Engineering, a B.A. in English, Graduate English and a Ph.D. in Philosophy. He has held professorial positions at the University of Virginia from 1951 to the present. A Professor of Humanities since 1969, he chaired the Division of Humanities from 1974 to 1978.

Dr. Hereford served as dean and consultant to the Federal Executive Institute in Charlottesville while on leave from the

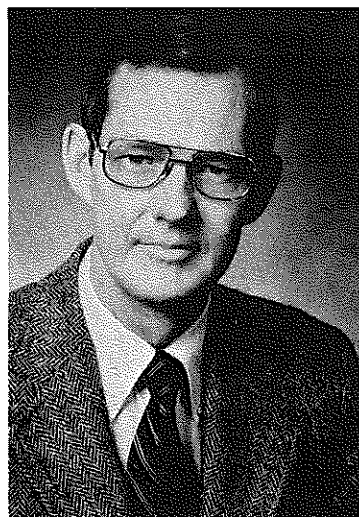
University of Virginia during 1969-1971.

Again on leave, Hereford has, from 1978 to the present, been Project Officer for the EPA Coal Technology Assessment Group at Research Triangle Park in North Carolina. As a consultant, he has conducted seminars on science, technology and public policy with the Washington Public Affairs Center of the University of Southern California.

According to Dr. Mueller, CSM vice-president for academic affairs, Dr. Hereford has been engaged in curriculum and faculty development in an interdisciplinary setting for over two decades. "Through the University of Virginia School of Engineering, which has long had a program to teach communications skills to engineering students, he (Hereford) has been deeply involved in designing and teaching courses in communications since 1951," said Mueller.

Dr. Hereford and his wife, Deborah Meade, will live in Golden with their two children—Leonore, age six, and Jessica, age one.

## CEO for CSM Foundation



Frank R. Lee

James C. Wilson, president of the board of directors of the Colorado School of Mines Foundation, Inc., announced recently the appointment of Frank R. Lee as chief executive officer of the CSM Foundation.

The task of the foundation is to develop private gift support for the sole benefit of the Colorado School of Mines and to manage and administer bequests and endowments. Currently, the foundation is engaged in an initial ten-year, \$63.5 million development program for the Colorado School of Mines with \$25 million raised since 1977.

According to Wilson, the need to obtain private funds for student financial

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aid, capital construction and endowed professorships has reached a new level of urgency.

"Mines is experiencing a surge of expansion," Wilson said, "fueled by the worldwide energy crisis and our own energy needs in the West. To maintain standards of quality education, the school's board of trustees has dramatically increased the levels of in-state and out-of-state tuition. At the same time, the trustees feel duty and honor bound to keep the school's doors open to qualified students from middle and lower income level families. As a result, the CSM Foundation has undertaken the task of raising more money for scholarships, grants and loans than we've ever attempted before."

Prior to last December, Frank R. Lee served the Independent Petroleum Association of Mountain States as executive director for four-and-a-half years. In that time, he brought the organization from its infancy to a membership of over 1,100 firms in 11 states. The organization is now one of the most respected regional oil and gas associations in the nation, noted Wilson.

Mr. Lee has been management consultant for a variety of energy companies with government relations problems.

He has served in Washington, D.C., on two occasions: initially as press secretary to Senator Peter Dominick (R-Colo) from 1963 to 1967, and subsequently as administrative assistant to then-Congressman William Armstrong (R-Colo).

"The nation, Colorado and the Colorado School of Mines all have special needs related to the energy crisis. It is essential that the CSM Foundation be in the strongest possible financial stance to help the school train the young minds that seek solutions to our energy problems. Speaking for the Foundation board of directors, I feel that Frank Lee's special talents in management, government work, and public affairs will greatly contribute to that goal," said Wilson.

## New Foundation Staff

Colorado School of Mines Foundation, Inc., has appointed two new staff members to assist with STE. The appointments were announced by William K. Coors, chairman of The Resource Fund and president of CSM Board of Trustees.

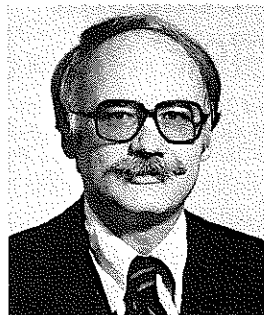
Named to direct major and annual giving programs was Norman J. "Jay" Lange, Jr., Oxford, Ohio. David Smith-Garbett, Salt Lake City, Utah, will direct publications and grant development, and

will provide assistance to the giving program.



Norman J. Lange

Lange has served in various fund-raising positions at the University of Chicago, Vassar College, the Medical College of Wisconsin (Milwaukee), and Deaconess Hospital (St. Louis). Most recently he was campaign manager for Miami University (Ohio), where he directed the University's Goals for Enrichment fund raising effort. He helped construct and write a plan for the University of Chicago's recent \$280 million capital campaign, serving as primary staff officer for the Chicago Challenge Fund and the Commodity Program. He is a graduate of the University of Maryland, College Park.



David Smith-Garbett

Smith-Garbett has held editorial and institutional advancement positions at the University of Iowa Foundation, Iowa City, and at Glassboro (New Jersey) State College. The winner of numerous communications awards, he has served as an editorial and design consultant and was a publications editor with Atlantic Richfield Hanford Company, a subsidiary of Atlantic Richfield Company. He is a graduate of the University of Utah, holds an MA from the University of Iowa, and is author of a novel about silver mining and a 19th century mining town.

The Resource Fund of Colorado School of Mines is a long-range, major development effort, the first phase of which seeks \$63.5 million in private support. Lange and Smith-Garbett join E. Russell White, director of The Resource Fund, and C. W. Leeds III, secretary of the CSM Foundation.

## Presidential Professor



Roger Wescott

Author, linguist, anthropologist, historian, futurologist and the winner of the \$64,000 Question, Roger Williams Wescott will serve as Presidential Professor of Humanities and Social

Sciences at the Colorado School of Mines during the academic year 1980-81. The post is financed by a grant to CSM from the AMAX Foundation, Inc.

Wescott has over 300 publications, 30 of which are books, including the singly-authored *Divine Animal: An Exploration of Human Potentiality*, Funk and Wagnalls, 1969; and the co-authored *Language Origins*, Linstock Press, 1974.

Wescott, born in Philadelphia in 1925, graduated summa cum laude and first in his class from Princeton in 1945. After he received his Ph.D. in Linguistics there in 1948, he held a Rhodes Scholarship at Oxford.

After extensive anthropological and linguistic fieldwork in Nigeria, Wescott founded and directed the African Language Program at Michigan State University.

Since 1966, Wescott has been Professor of Linguistics in the Humanities Division of the Graduate School and Professor of Anthropology in the Social

Science Division of the College of Liberal Arts at Drew University in Madison, New Jersey. He founded Drew's Anthropology Department and chaired it until 1978.

A man of wide-ranging interests, Wescott serves as co-editor to the periodicals of *Kronos*, *Futurics*, *Forum Linguisticum* and the *North American Journal of Geology*. He also serves as a regular reviewer for *Science* magazine.

According to the search committee, headed by CSM President Guy T. McBride, Wescott was appointed Presidential Professor based on the following criteria:

That Wescott has made a solid achievement in a recognized discipline (Linguistics);

That he has found significant achievement in a linked discipline (Anthropology);

That he has the ability to stimulate students;

And that he has the ability to conduct a wide-ranging program of intellectual activity.

## Faculty Additions

In addition to all the new faces of freshmen and transfer students this fall, there will be new faces among the ranks of faculty and administration at the Colorado School of Mines this fall.

Gail P. Klock, Assistant Professor of Physical Education and Athletics, will be the new women's coach and instructor. Klock earned her B.S. from the Colorado State University and her M.S.P.E. from the University of Northern Carolina, Greensboro. In the past eight years, she has coached and taught in the Madison, WI, Public Schools; Wake Forest University; Springfield College; and Brown University.

Baki Yarar, Associate Professor of Metallurgy, earned his B.S. and M.S. from the Middle East Technical University in Ankara, Turkey, and his Ph.D. and D.I.C. from the University of London, England. He has taught at the University of Diyarbakir, the Academy of Engineering in Eskisehir, the Middle East Technical University in Ankara and the University of British Columbia. Yarar is a native of Turkey.

Martin R. Rice, Adjunct Professor in Humanities as Conductor of the Glee Club, hails from the Otero Music Association in Alamogordo, New Mexico. He has served as creative arts program director at George Williams College and director of choral music at Roosevelt University.

Kathleen H. Ochs, Assistant Profes-

sor of Humanities and Social Sciences, earned her B.A. from the University of Oregon, an M.A.T. from Wesleyan University and an M.A. from the University of Toronto. She has been active in researching the history of science and technology.

Gunther Ulrich Holzer, Assistant Professor of Chemistry and Geochemistry, earned his Chemical Engineering degree from the Academy for Chemistry and Physics, Isny, Germany; and his Ph.D. in organic chemistry from the University of Houston, where he has served the past five years as Research Associate Visiting Assistant Professor.

Frank Victor Kowalski, Assistant Professor of Physics, earned his B.S. in Math and Physics from the University of Puget Sound and his Ph.D. in Physics from Stanford University. He recently served as a research associate at JILA in Boulder. Prior to that, he was a research assistant at the Stanford Linear Accelerator and the Aragonne National Lab.

Frank Anthony James, Visiting Professor of Chemistry and Geochemistry, earned his B.S., M.Ed. and Ph.D. from the University of Georgia. His teaching duties have included tours at the University of New Mexico, Wesleyan College, University of Denver, Austin College and Mercer University.

Anshumali Gangwar, Associate Professor of Mineral Economics, earned his

Engineering Science Degree at the Henry Krumb School of Mines, Columbia University, N.Y. He has worked extensively with Fuel & Mineral Resources, Inc., Asarco Inc. and Anaconda.

Jim S. Chung, Professor of Basic Engineering, earned his B.S.E. from Seoul National University, his M.S. from the University of California and his Ph.D. from the University of Michigan. He has worked extensively for Lockheed M & S Co., Exxon Production and Naval Ship R. & D. Center.

Carl Nelson Kallansrud, Director of Research Administration, earned his M.B.A. at the University of Denver and his B.S. from Michigan Tech. For the past two years, he has been the Contracts Administrator for CSM.

Robert Joseph Hensley, Jr., Admissions Counselor, earned his B.S. from the University of Tulsa, where he served as admissions counselor for the past two years. Prior to that, he was a technical report writer for Arjay Engineering in Tulsa.

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## Leave It To Leaver



June Leaver

East High School in Denver, Leaver didn't plan on coming to Mines, despite the fact that her family is deeply involved in mining. "It just happened," she grinned. Her father, Fred, runs his own geological exploration business, while her mother, Helen is a metallurgist for AMAX. The Leavers make their home in Pine Junction.

"The whole idea of having a student trustee on the board is to provide a sounding board for the trustees and administration on how the student body might react to various proposals," said Leaver.

"I guess I became interested in the position by working on a seminar that we students presented to the trustees this summer, called 'Student Life.' I got involved because I've been concerned about student-teacher relationships. Being a student trustee would give me an opportunity to make my views known," she said.

Those views have gone through a number of changes. "After I talked to a number of faculty members, I realized that some of the poor relationships I've seen on this campus have more than one side to them," Leaver noted.

"I'm not sure they'll like everything they hear. I understand that this is a pretty unique effort we and the trustees are making to understand each other. From what I've been told, no other school in Colorado has ever done this," she said.

No other school in Colorado has ever had a voting student trustee, yet Board of Trustees President William K. Coors recently expressed the sentiment that maybe a student trustee should have a vote. "I don't know how the other board members feel, but I'd be comfortable about it," Coors said, referring to the performances of the past two student trustees—Steve Ruehle and Doug Aab.

In the past 107 years, there has never been a woman's voice on the Colorado School of Mines Board of Trustees. All that will change this fall when June Leaver takes her seat as the Student Trustee on the board.

The fact that she will be a non-voting board member is not a reflection of rampant male chauvinism at CSM, since the four male CSM student trustees before her couldn't vote either. It is, however, a reflection that while still a minority on the Mines campus, the woman engineer is here to stay. In student elections held this spring, twenty-eight percent or 5 out of eighteen student offices were won by women students, yet women constitute only 16% of the student population.

Leaver, 20, is a junior, majoring in Geological Engineering. A graduate of

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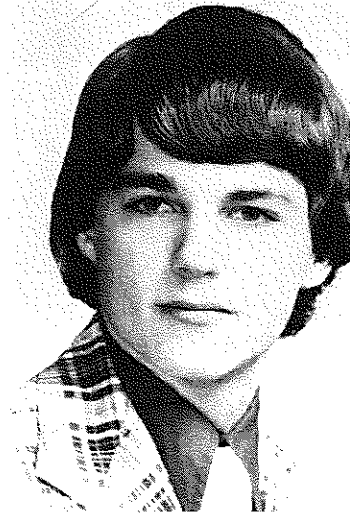
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## CSM Graduate Student Awarded \$8,000 Scholarship

A Ph.D. candidate at the Colorado School of Mines in Golden, Bryan Anthony James, has been named the first recipient of the Brent D. Fuller Scholarship awarded by the Foundation of the International Society of Exploration Geophysicists (SEG).



Bryan James

The \$8,000 scholarship, applicable to the 1980-81 school year, was established as a memorial to the late Brent D. Fuller, a respected exploration geophysicist with Schlumberger-Doll Research Center in Ridgefield, Conn. and an active member of the 13,000-member SEG, headquartered at Tulsa, Okla.

S.O. Patterson, chairman of the SEG Foundation trustees, explained the purpose of the new Fuller SEG award is to support a graduate student in the field of nonseismic exploration geophysics. James' doctoral thesis is primarily concerned with the development of a numerical modeling technique called Summary Representation and its application to geophysics.

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Sep. 13—Colorado College	1 p.m.
Sep. 20—at Southern Utah	1 p.m.
Sep. 27—at Southern Colorado	TBA
Oct. 4—OPEN	
Oct. 11—Mesa College	1 p.m.
Oct. 18—at Western State	1 p.m.
Oct. 25—Western New Mexico (Homecoming)	1 p.m.
Nov. 1—at Adams State	1 p.m.
Nov. 8—at Ft. Lewis College	1 p.m.
Nov. 15—New Mexico Highlands	1 p.m.

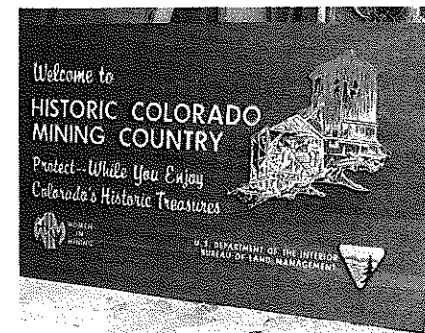
### FOOTBALL PROSPECTUS

The 1980 Oredigger football team has a hard act to follow. The 1979 squad went 6 and 4 for the season, 5 and 3 in the Rocky Mountain Athletic Conference. Due to graduation, the Miners have lost most of their tough and canny defensive secondary, and the passing talents of Chuck VanAllen, fifth in scoring and 13th in total offense in the NCAA, Division II.

However, the Orediggers have two of the toughest scorers in the conference coming back, along with the best group of linebackers and offensive linemen in recent memory.

The top returning scorers for coach Marv Kay are 6'3", 200 lb. tight-end Tom Netzel of Longmont and Mitch Knapton, a 5'11", 185 lb. Yuma running back—both of whom have made the All-Conference and All-District teams in their collegiate careers.

Indeed, Knapton has already established a firm hold on the Oredigger record book, with a career rushing aver-



This sign, along with two interpretive pedestals, was recently installed at the famous Georgetown train Overlook, on Highway 70, near the mountain towns of Georgetown and Silver Plume. Jointly sponsored by Women in Mining and the Colorado office of the Bureau of Land Management, it welcomes visitors to the fascinating world of Colorado mining country.

## CSM SportScope

age of 4.2 yards per carry. All he needs for the upcoming season is 226 yards, to break the current career rushing record of 1,929 yards held by Jim Taylor since 1970.

Netzel caught 42 passes last year for 536 yards and two touchdowns. He averaged 54 yards a game and almost 13 yards per carry.

The Orediggers' experienced core of linebackers consist of 6'2", 195 lb. Tom Vander Ark; 5'11", 185 lb. Arne Birkness; 6'0", 202 lb. Joe Cavarra; and 6'0", 178 lb. Ken Kerrihard.

The Oredigger offensive line will weigh in at an average 220 pounds. The veterans at trench warfare will include 6'0", 250 lb. Kevin Hammerly; 5'11", 205 lb. Roger O'Connor; 5'9", 205 lb. Steve Schwab; 6'3", 227 lb. Tim Albers; 6'0", 202 lb. Steve Kearney; 6'2", 215 lb. Scott Troyer; 6'2", 200 lb. Carl Smith; 6'2", 225 lb. Mike Troyer; 6'1", 213 lb. Mark Cousins; 6'1", 195 lb. Keith Zmerzlikar; and 6'4", 190 lb. Jim Bergamo.

According to Kay, the key to the 1980 season will be found in the quar-

terback position and in the defensive secondary. Senior Mark Gill and sophomore Mike Scherrer will vie for the quarterback job. Neither saw much experience while Chuck VanAllen was at the helm. The question for Kay will be to choose between Gill's maturity, or the raw talent of Scherrer, who passed for 1,298 yards for Golden High School in 1978, making him the top prep passer that year.

Overall, the Orediggers enter the 1980 season with 32 returning lettermen. "Of those 32," said Kay, now in his twelfth year as head coach, "nine are offensive starters and five are defensive starters."

Of the recruits, the Orediggers may enjoy a banner year. Thirteen were All-Conference players throughout Colorado, and three played in the 1979 All-State game.

"It is hard to tell what a freshman can do for a team, regardless of what he did in high school. We'll have to see what summer did for a number of recruits and upperclassmen, as we go into fall practice and the season itself," said Kay.

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## soccer

### 1980 SOCCER SCHEDULE

Sep. 15—REGIS COLLEGE	4 p.m.
Sep. 20—WYOMING UNIVERSITY	1 p.m.
Sep. 23—at Denver University	4 p.m.
Sep. 25—BRIGHAM YOUNG UNIVERSITY	8 p.m.
Sep. 28—at Colorado University	2 p.m.
Oct. 1—at Metro State College	4 p.m.
Oct. 6—DENVER UNIVERSITY	4 p.m.
Oct. 9—ROCKMONT COLLEGE	4 p.m.
Oct. 12—COLORADO COLLEGE	2 p.m.
Oct. 15—at Air Force Academy	4 p.m.
Oct. 18—at Colorado State University	2 p.m.
Oct. 21—at Rockmont College	4 p.m.
Oct. 24—at Regis College	4 p.m.
Oct. 26—UNIVERSITY OF NORTHERN COLORADO	1 p.m.

\* Capital letters denote home games

### 1980 SOCCER PROGRAM

This fall, the Orediggers will be playing soccer under a full-time coach for the first time in the history of the school, when Bob Pearson takes over for John Beers—who has stepped down after seven years of service as volunteer coach for the team. Colonel Beers will still be helping with the program, acting as announcer for our home games.

Pearson greets a predominately sophomore and junior squad this season, as nine of the eleven returning lettermen are in those two classes. The other two lettermen are seniors Jorge Lira and Randy Ellis. Last year, Lira was selected as an all-conference midfielder in the

Rocky Mountain Intercollegiate Soccer League. Also, Tom Young was named to the RMISL second team as a defender in his freshman season.

This year, the Miners must develop a scoring threat in order to be successful in RMISL competition, where the Orediggers finished the 1979 season in seventh place. It looks like last year's co-champions (Air Force Academy and Colorado College) are the favorites again this season, with Denver University and Metro State College close behind. With a stronger offense, the Miners will add their name to the list of contenders in 1980.

### 1979 Results

- \* Mines 1, Metro State 2
- \* Mines 0, Regis College 1
- Mines 3, Wyoming Univ. 1
- Mines 1, Colorado Univ. 3
- \* Mines 0, Denver Univ. 4
- Mines 3, Rockmont College 0
- \* Mines 1, Air Force Academy 5
- \* Mines 2, Colorado College 8
- \* Mines 0, Metro State 1
- \* Mines 0, Regis College 0
- \* Mines 0, Denver Univ. 4
- Mines 1, Colorado Univ. 3
- Mines 1, Colorado State Univ. 3
- Mines 2, Univ. of No. Colorado 3

### RMISL Final Standings, 1979 Season

Colorado College	4	1	1
Air Force Academy	4	1	1
Denver University	4	2	0
Metro State College	4	2	0
Brigham Young University	2	3	0
Regis College	1	5	0
Colorado Mines	0	5	0

Overall record: 2 wins, 11 losses, 1 tie

\* Conference game (home-and-home series counted as one game in conference standings, based on total score).

## New Coach

### Bob Pearson

Our new Soccer coach is now in his 15th year at Mines. His coaching assignments over the years have included Football, Basketball, Tennis, Track, Baseball and Soccer. This year, in addition to his Soccer duties, he will be the assistant Basketball coach and the Intramural Director.

Pearson is a Navy veteran of the Korean era and a 1959 graduate of Mines. After a short time in engineering, he assumed the directorship of the Golden Recreation Department when it opened in 1961. As Golden's recreation director, he brought youth Soccer to the community in 1961. This program has expanded into the Table Mountain Soccer association, providing competition for hundreds of area boys and girls. Pearson also acted as administrator for Mines' 1970 varsity team, which placed third in the NCAA College Division playoffs in Fullerton, California.

## Harriers

### CROSS COUNTRY PROSPECTUS

The Oredigger harriers had a rather dismal year of it in 1979, when they finished last in the RMAC. Unless some good prospects show up for training from the 1980 freshman class, the Orediggers hold little hope for improvement, short of marked improvement in the returning lettermen.

Returning lettermen include Tom Dooley, Doug Hugill, Andy Jones and Randy Versaw. The strongest runners from last season, Tom Bruington and Dan Scrivner, have completed their eligibility or have graduated.

This will be the last coaching season for CSM cross-country coach Joe Davies, who will retire at the end of the fall sports season.

### 1980 CROSS COUNTRY SCHEDULE

Sept. 13, 11:00 a.m.—Western State College Invitational at Gunnison

Sept. 20, 11:00 a.m.—COLORADO SCHOOL OF MINES INVITATIONAL at Golden

Sept. 27, 11:00 a.m.—University of Southern Colorado Invitational at Pueblo

Oct. 4, 11:00 a.m.—Denver Track Club Invitational, City Park, Denver

Oct. 14, 10:00 a.m.—University of Northern Colorado Invitational at Greeley

Oct. 18, 10:00 a.m.—U.S. Track and Field Federation at Boulder

Oct. 25, 10:00 a.m.—Air Force Academy Invitational at USAF Academy

Nov. 1, 11:00 a.m.—RMAC MEET at Golden

\* Capital letters denote home meets

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## volleyball

### 1980 VOLLEYBALL ROSTER

\* Michelle Bell, Sophomore, 5'0", Position—Setter, from Colorado Springs (Doherty)

\* Debbie Bouvier, Junior, 5'5", Position—Setter/Util., from Pueblo (South)

Brenda Crumb, Freshman, 5'6", Position—Hitter, from Colorado Springs (Palmer)

Janet Esgar, Freshman, 5'7", Position—Hitter, from Wiley

Holly Finian, Freshman, 5'4", Position—Setter, from Walden (North Park)

\* Debbie Griebing, Sophomore, 5'9", Position—Hitter, from Evergreen

\* Tammy Muhic, Junior, 5'8", Position—Hitter/Util., from Pueblo (County)

\* Sue Schulte, Junior, 5'8", Position—Hitter/Util., from Denver (Marycrest)

\* Sandy White, Sophomore, 5'7", Position—Hitter/Util., from Arvada (West)

\* Returning Letter Winners

### 1980 VOLLEYBALL

The 1980 Oredigger volleyball team will feature more experience than ever before, thanks to returning letterwomen. The squad will be led by setter Michelle Bell, last year's MVP and team member of the RMAC All-Conference squad. Debbie Griebing will return as a powerful hitter, while Tammy Muhic, Sue Schulte, Sandy White and Debbie Bouvier will add strength to both the net attack and the back court defense.

Two key players will not be back. Marie Uhle has transferred to Wyoming, and Mary Meagher plans to concentrate on basketball.

Based on solid experience, the real future of the volleyball team will depend on freshman talent and the coaching skills of the new coach, Gail Klock, who has coached women's teams at Springfield College, Brown and Wake Forest Universities.

Last year, the Orediggers were 4-4 in the RMAC East Division, and 7-10 overall.

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Sept. 16, Colorado Women's College and Colorado College at CWC

Sept. 26, 2:00 p.m.—University of Southern Colorado and Adams State College at USG

Sept. 27, 5:00 p.m.—NEW MEXICO HIGHLANDS and MESA COLLEGE

Sept. 30, at Regis College  
Oct. 4, at Metro State College Tournament

Oct. 6, 5:00 p.m. & 8:00 p.m.—FT. HAYS STATE COLLEGE and COLORADO WOMEN'S COLLEGE

Oct. 10, at Mesa College

Oct. 11, Western State College and Ft. Lewis College at WSC

Oct. 14, 7:00 p.m.—REGIS COLLEGE

Oct. 17, at New Mexico Highlands University

Oct. 18, at Western New Mexico University

Oct. 23, 7:00 p.m.—ADAMS STATE COLLEGE

Oct. 24, at Colorado College

Oct. 25, Tournament

Oct. 31, 5:00 p.m. & 8:30 p.m.—WESTERN NEW MEXICO UNIVERSITY and AIR FORCE ACADEMY

Nov. 4, 7:00 p.m.—UNIVERSITY OF SOUTHERN COLORADO

Nov. 8, RMAC Playoffs (Eastern Division)

Nov. 14, Region 7 Tournament  
Nov. 15, at Regis College

## Gail Klock New Women's Coach

The women's athletic program at Mines is now headed by Gail Klock, Assistant Professor of Physical Education and Athletics. Klock is a graduate of Colorado State University and earned her MSPE degree at the University of North Carolina in Greensboro.

Since that time, she has taught and coached at Brown University, Provi-

dence, RI; Springfield College, Springfield, MA; Wake Forest University, Winston-Salem, NC; and the Madison Public Schools, Madison, WI.

Women's athletics at CSM is still fairly new, but that won't be an unusual situation for Klock. Wake Forest and Brown didn't have women's athletics until the late 60's and early 70's.

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## NCAA Scholarship

A Colorado School of Mines graduate is the only athlete in Colorado to win the prestigious National Collegiate Athletic Association Postgraduate Scholarship Award, according to Walter Byers, NCAA executive director. Stephen Thomas Lowe, a NCAA All-American swimmer and 1980 Mines graduate, will receive \$2,000 for postgraduate study at the university of his choice.

Lowe, 22, earned a 3.642 grade point average and two bachelor of science degrees—one in Mineral Engineering Mathematics and the other in Mineral Engineering Physics. He plans to attend Stanford University in California this fall, where he has a physics research assistantship in the doctoral program.

"I'm starting out in high energy physics. I'll do a lot of work at SLAC, the Stanford Linear Accelerator Center. Things are really happening at Stanford. They just finished building one of the world's fastest energy accelerators," said Lowe.

Lowe was nominated for the scholarship by his swimming coach at Mines, Bob McCandless. "Steve is the finest swimmer I've seen in my 11 years at Mines. Steve was an All-American all four years. He holds three school records, anchored the fastest 400 medley relay team in the school's history and has three Rocky Mountain Athletic Conference records to boot," said the coach.

Lowe's records at CSM are the 50 yard freestyle in 21.6; 200 yard freestyle in 1:47.6 and the 100 yard freestyle in 47.1. He anchored the 400 yard medley relay with a time of 3:38.0.

"I think Steve picked Stanford because they're usually 10 years ahead of the pack," said McCandless. "Steve

has one of the most profound senses of curiosity I've ever seen. He's always been that way, even when he was little. His parents had to kick him out of the house and away from the books. He wound up in swimming and has been a natural ever since."

Lowe is currently working for the Solar Energy Research Institute in Golden. "I'm working in the physics lab, focusing on silicon purification procedures that will help improve solar cells," said Lowe.

## A Note From The Past

**3-21-1879**—The Central City Register does not like the law appropriating \$3,872 for the establishment of a school of mines in connection with Jarvis Hall, at Golden City. It even goes so far as to declare it "a deliberate swindle." And its only objection so far as we can make out is that the school is not located in a mining town. This does not seem to us a serious objection.

Students do not need to go down a shaft to learn all that is necessary about the sciences of mining and metallurgy, and if an inspection of actual work in the mines would be useful, it will be but a pleasant trip to Central, and a couple of days there will teach them all there is peculiar and important about it.

The Register is on the wrong track this time. The school of mines is not in its inception, and will not be in its results, a swindle, but an institution of great benefit to the territory.—*The Rocky Mountain News*.

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## Arco Humanities Chair

CSM President Dr. Guy T. McBride has announced the appointment of an ARCO professor. The School received a \$500,000 gift from the Atlantic Richfield Foundation in 1979, the purpose of which was to fund an endowed ARCO Professorship in Humanities and Social Sciences, as well as to fund a scholarship program for non-resident, undergraduate students.

Dr. Joseph D. Sneed, formerly of the Philosophy Department in The State University of New York at Albany, is the newly-appointed holder of the ARCO Chair. Sneed, 42, is a native of Durant, Oklahoma. He earned a B.A. in physics from Rice University, summa cum laude; a M.S. in physics from the University of Illinois; and his Doctor of Philosophy in philosophy from Stanford University.

The task set for the ARCO fund and professorship is to revise the direction, structure and content of the humanities and social sciences curriculum, working with departmental faculty.

Dr. Sneed has focused much of his energies on logic, philosophical foundations of science, political philosophy and the impact of science on modern society. Based on such an interdisciplinary background, Sneed would agree with Dr. McBride's statement that, "An engineer concerned only with numbers, and not human values—both his own or those of society—will not be as effective an engineer as he can be. This professorship signifies a mutual understanding on the part of the Atlantic Richfield Foundation and the School of Mines that outstanding teaching and scholarship in humanities and social sciences are important in engineering education."

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## letters

Dear George,

Ione and I wish to tell you again how much we enjoyed our commencement weekend in Golden. You, Dr. McBride, and your staffs truly put together a program we will never forget and we thank you sincerely.

I only wish more members of the class had been able to attend. I strongly urge members of future "50 year" classes to make a special effort to attend their reunions.

Again, thank you for a great time.

Sincerely,  
Robert N. Hastings, '30

To The Denver Post:

Over the past few years we have observed a subtle change in the environmental movement, with emphasis shifting more and more to the conservation of natural resources. This has seemed to broaden the base of the movement, for who could reasonably oppose the principles of conservation? Like most such causes there are both beneficiaries and victims. We all benefit from a cleaner environment, but we are all victimized by the rampant inflation heavily contributed to by the gross overkill now witnessed in almost all facets of environmental conservation issues.

Three recent events seem to emphasize the fact that not all persons are enjoying the same benefits or suffering the same penalties from the environmental and conservation measures. Indeed it appears that the leaders may be faring better than the rest of us. First we learned of John Denver's attempts to install oversized gasoline storage tanks on his properties near Aspen so that in the event of a fuel shortage he, at least, would not have to walk. More recently Robert Redford was caught in the act of having his helicopter land in an off-limits mountain area so that he and his friends could ski in the pristine wilderness forbidden (by law as well as economics) to most people. Now we read that Jane Fonda was ticketed for driving 75 mph in a 55 mph zone, certainly not the way to conserve fuel.

While these acts can hardly be termed serious violations of law or proper conduct, they nevertheless are significant in the context that they were committed by persons who have been in the forefront of the environmental and conservation movement, folk heroes if you will. What possesses these people to violate the rules that they would have the rest of us live by? Do they want us to preserve and conserve so that they will continue to have the resources to enjoy their own examples of rather conspicuous consumption? Or are they finding that the degree of regulation that they fought for has become a bit constraining, or boring, or even a trifle meaningless? Whatever the reasons, let us hope that we see no more of this sort of thing for proper environmental concerns and good conservation practices are too important to be compromised by hypocrisy and greed among those who would be leaders. At least that is what John, Robert and Jane have been telling us all along.

Russell L. Wood '49

(Ed. Note: The above letter, edited by The Denver Post, appears here in its entirety.)

Dear Mrs. Petty,

On behalf of the National Coal Board PR personnel who attended your presentation in Doncaster on Friday can I thank you for a thought-provoking contribution to our professional meeting.

As I mentioned in my remarks, your visit was not only interesting and useful in its own right but also acted as a catalyst, bringing together a group of people with interests in the public relations aspects of the mining industry in the North of England who have never previously joined together as a group. Who knows what we have created here?

We appreciated the time which you devoted to preparing and delivering your talk and hope that the remainder of your visit to Britain was as rewarding for you and for those whom you met.

Yours sincerely,  
Fred Sanderson  
Regional Public Relations Officer  
Yorkshire, England

Dear Ms. Petty,

As a trans-Atlantic reader with more than a passing interest in mining industry publicity may I be allowed to "put in my ha'porth" to the search for a title for your interesting column.

My suggestion is "Embers"—with the emphasis on the "em"; 'M' for Mines and "em" as a symbol of the printed word (assuming that you use the "em" as a printer's measure in the United States?).

There's a reflective quality about embers—as there often is to the considered editorial commentary. Embers are, after all, the distillation of much heat and fury. They invite you to come closer and quietly consider after the flames of controversy have raged awhile. They glow with quiescent, spent energy.

And yet they are capable of being fanned into life, to start new fires of thought and action—bushfires which, in the editorial context, can spread far beyond the confines of the printed page.

Whether or not the choice appeals, may I wish continued strength to your pen and, to quote our *Scottish neighbours*, "Lang may your lum reek."\*

Yours truly,  
Fred Sanderson  
Regional P.R.O. (Yorkshire)  
National Coal Board

\*Trans.: Long may your chimney smoke.

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Dear Mr. Pfeutze,

Thanks for taking the time to fire a well-deserved shot at "Mousey Dung" via your letter to the editor in the June, 1980 Mines Magazine. You voiced my sentiments exactly.

Mrs. Petty appears to be a top notch journalist, and I think she has fashioned several improvements in the magazine. Like most media people, her knowledge of the real world could be better. Factual courteous letters from Alumni are a step in the right direction.

Sincerely,  
John Biegel, '39

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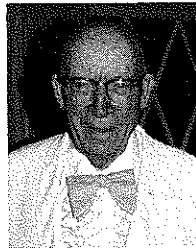
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## in memoriam



**Richard M. Fullaway**

Richard M. "Steve" Fullaway, E.M. 1916, died from cancer on May 25, 1980 at the age of 87.

He was born in Los Angeles on November 4, 1912. While at Mines he earned letters in baseball, football, track and rugby, and was awarded a lifetime pass to CSM athletic events in 1937.

After graduation he worked in various mines in California, Nevada, Arizona and Mexico. During World War I, he served in the Corps of Engineers as a 2nd Lt. Fullaway worked for Standard Oil Company of California for 35 years until his retirement in 1957. He was considered an expert in oil cleaning and waste water disposal and had worked in the areas of civil, petroleum, mechanical and chemical engineering.

Fullaway was active in CSMAA and assisted in recruiting students for CSM. He was selected a Fellow in the American Institute of Chemists and was a 50-year member of the Masons, 32 degree.

His wife, the former Callista McCormick, and two sons preceded him in death. One son, Robert Fullaway, five grandchildren and four great-grandchildren survive him.

### Harold W. McGowan

Harold W. McGowan, E.M. 1923, died November 12, 1979, in Laguna Hills, California.

Born in Denver on November 20, 1899, he attended Manual Training High School before entering Mines. Upon graduation he moved to California to work on the Palos Verdes Project as a draftsman. In 1926 he joined the Los Angeles County Sanitation Districts. After two years he moved to the county's Road and Highway Division, where he served until 1961. At the time of his retirement he had advanced to district maintenance engineer.

McGowan was serving as permanent secretary of the Laguna Hills Beta Theta Pi Alumni Association at the time of his death.

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**R.C. Earlougher '36**

### Robert R. Allen

Robert R. Allen, Met.E. 1940, died of a massive heart attack at his home on April 19, 1980.

Born November 20, 1913, in Hancock, Mich., he was the son of Maynard C. Allen, a 1906 Mines graduate. Allen spent his early years in Arizona until his family returned to Golden. He attended the University of Colorado for one year before transferring to Mines. During World War II he was employed at Wright Aeronautical Corporation in Patterson, N.J.

In 1946 he returned to Golden as an employee of the U.S. Bureau of Mines, where he continued for 20 years until his retirement. He was later employed by the State of Colorado's Civil Defense Agency at Camp George West. He retired from that position a few years ago.

He was a former member of the American Society of Metallurgical Engineers. Particularly interested in the history of Colorado mining, he was pursuing his research in this field as it concerned the Cornish miners.

Surviving Allen are his wife, the former Eileen Wagenbach, a son, daughter and step-grandson.



**Robert L. Poundstone**

Robert (Bob) L. Poundstone, P.E. 1941, died in Denver on June 25, 1980. He was 62 at the time of his death.

He was born in Tulsa, Oklahoma on April 6, 1918, where he attended schools prior to entering Mines. While in Mines, he was a member of ATO fraternity, AIME, ASME and participated in intramural sports all four years. During World War II he served in the U.S. Navy.

Poundstone worked for Carter Oil Company, Christensen Diamond Products Company, and with Gene Goff. Between 1956 and 1970, he operated as an independent consulting engineer out of Kimball, Nebraska. In 1970 he became associated with the Vessels Oil and Gas Company and was Vice President-Operations for this company at the time of his death.

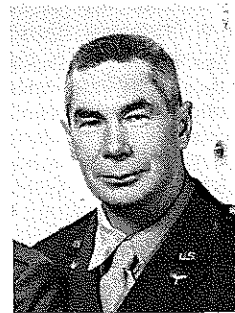
On May 15, 1943, he married G. Ruth Hayden. Surviving Bob, in addition to his wife, are a son, Michael H. Poundstone of Casper, Wyoming, a daughter, Ann P. Daniels of Denver, and a sister, Pauline Holloway of Tulsa, Oklahoma.

Contributions may be made to the Robert L. Poundstone Memorial Fund in care of St. Luke's Episcopal Church, 1270 Poplar Street, Denver, Colorado 80220.

Many thanks to Clay Craeger, P.E. 1941, for this memorial.

### Wesley N. Farmer

Wesley N. Farmer died in March 1980, after a long illness. He attended and was often a guest lecturer at Mines. After 18½ years with Atlantic Richfield Oil Co., he moved to Denver to become vice president of Oceanic Exploration Co. At the time of his death he was chairman of the board and past president of that company. He is survived by his wife, four sons and four grandchildren.



**Harold McConnell**

Harold McConnell, E.M. 1926, died October 29, 1979 in Torpedo, Penn., where he was born on March 1, 1894.

He received an A.B. in Geology from the University of Oregon before entering Mines in 1923. He was employed by Alaska Juneau Gold Mining Co. until 1930 when he returned to his home town where he owned and operated a general merchandise business. During that time he was also the Postmaster for Torpedo. He retired in 1956.

McConnell was a member of the Masonic Lodge, 32 degree, and a veteran of both World Wars.

He is survived by his wife, Georgia.

### D. Lowell Kessler

D. Lowell Kessler, Geol.E. 1925, died at Mercy Medical Center in Denver at the age of 78. At the time of his death he was retired from Gates Rubber Co. where he had served for 36 years.

He was born March 19, 1902, in Red Cloud, Neb., and had lived in Denver for 70 years. He attended Manual Training High School.

Kessler was a registered professional engineer and a member of Beta Theta Pi.

He was instrumental in establishing industry standards of the American Petroleum Institute, American Society of Agricultural Engineers, Society of Automotive Engineers, Rubber Manufacturers Association, and Mechanical Power Transmission Association in the mechanical engineering specialty of power transmission. He represented these associations in the American National Standards Institute and was influential in getting their standards accepted by the national body. He also worked toward international acceptance of the American standards.

He is survived by his wife, the former Fay L. Mulligan, a daughter and three grandchildren.

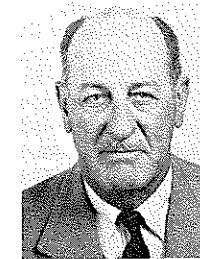
### Henry L. Conger

Henry L. Conger, E.M. 1930, died on February 2, 1980, at the Veteran's Home of California in Yountville.

He was born in DeSoto, Iowa, on November 23, 1901. After two years' service in World War I, he graduated from high school in Seattle, Washington. Following his graduation from Mines, Conger worked for several mining and engineering firms across the country.

In 1941, he was employed by the Corps of Engineers, U.S. Army, Honolulu District. He received special commendation for merit from the Corps for his work on the Johnston Island water system and radio range project. He moved to the firm of Law & Wilson, architect-engineers, in 1950 and later was employed by Portner-Urquhart, Skidmore, Owings & Merrill, Associated, on the Moroccan Air Base Project as chief engineer.

He is survived by a son and daughter.



**Wayne H. Denning**

Wayne H. Denning, Geol.Eng. 1926, died at his home in Morro Bay, California, on June 11, 1980. He was 83.

A native of Iowa, he was a veteran of World War I, after which he attended the University of Nebraska. In 1922 he moved to Golden and enrolled in Mines.

After graduation he worked for Midwest Refining Company in Denver until the beginning of the Depression. In 1934, he joined Western Geophysical Co. in Pasadena, where he remained until his retirement in 1953 as vice president of that company. Although officially retired he was self-employed as a consultant at the time of his death.

Denning was a member of AAPG, SEG, AGI, and Beta Theta Pi, Tau Beta Pi and Theta Tau. Between 1958 and 1962 he was planning commissioner for San Luis Obispo County in California.

He is survived by his wife, the former Betty Kimble, a daughter and three grandchildren. His first wife and two sons preceded him in death.

Many thanks to Oran L. Pack for the information above.

### Charles P. Miller

Charles P. Miller, died April 18, 1980 at his home in Hobbs, New Mexico. He attended Mines and was a member of the Professional Engineers Society. He owned and operated the Miller Engineering and Geological Co. in Hobbs. He is survived by his wife, two sons and eight grandchildren.

### Arthur E. Safe

Arthur E. Safe died April 18, 1980, in St. Joseph Hospital, Denver. He attended Mines before serving the Army during World War I. Between 1926 and 1942 he worked for Piggley Wiggley Grocery Stores, and then transferred to the U.S. Mint in Denver until his retirement in 1967. He is survived by his wife, four sons, 14 grandchildren and five great-grandchildren.

### Frank Cadena

Frank Cadena, Met.E. 1927, died May 18, 1979 at his home in San Antonio, Texas. He was 82 at the time of his death.

Born in Realitos, Texas, he received a B.A. in Chemistry and B.Sc. in Chemical Engineering from the University of Texas in 1922. He was a chemist for Cementos Hidalgo in Mexico until entering Mines in 1925.

After graduation he joined Allis-Chalmers Mfg. Co. in Wisconsin. During the depression years he served as an engineer for TWA and published a paper on Aggregate Production Methods at Hiwassee Dam. In 1944 he became manager of his father's properties in Texas and later had his own ranch. He also did occasional consulting work until his retirement in 1968.

Cadena served as an infantry sergeant in World War I. He was a former member of the American Chemical Society and AIME. At Mines he was elected to Sigma Gamma Epsilon, honorary geology fraternity.

### Charles S. Ryland

Charles S. Ryland died at his home in Golden, April 12, 1980. He attended Mines before transferring to Denver University where he earned a B.Sc. in chemistry in 1940. An employee of Coors Porcelain Co. for 35 years, he retired in 1978. At the time of his death he was writing a book for Scientific Apparatus Makers Assn. and compiling a history of Coors Porcelain ware. He is survived by his wife, the former Elsie Vogel, a son and daughter.

### Federico Videgaray

Federico Videgaray, Met.E. 1930, died December 30, 1979, at his home in Mexico.

While at Mines he earned letters in varsity baseball during four seasons and later received a lifetime letterman's pass for his service. In 1966 he was general manager for Seguetas Star de Mexico.

He is survived by his wife, Marita Elena, who still resides in Mexico.

### DAVID E. SMINK, P.E.

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**Howard C. Pyle**

Howard C. Pyle, Hon.D. Engr. 1959, a retired petroleum executive, died in Orange, California on May 12, 1980, following heart surgery. He was 76.

Born in Arizona, Pyle grew up in Pasadena. He joined Union Oil Company of California in 1927 as a geologist and petroleum engineer after graduating from the University of Southern California at Berkeley with an MS degree in petroleum engineering. He was chief production engineer for the company when he joined the U.S. Army in January 1943. Pyle was instrumental in supplying the Allied forces with oil through portable fuel lines.

After his discharge, he joined Bank of America as vice president for petroleum financing. During his career in the oil industry he served as president of Monterey Oil Co., director of Santa Fe International Corp., and director on the board of Reserve Oil and Gas Corp.

In 1959 he was president of the American Institute of Mining Engineers and received the honorary degree of Doctor of Engineering from Mines.

He is survived by his wife, Linda, a son, daughter and five grandchildren.

**LAWRENCE E. SMITH, MET.E. 1931**  
*Vice President - Operations*  
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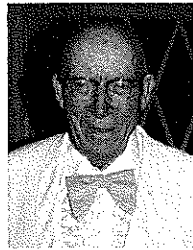
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## in memoriam



Richard M. Fullaway

Richard M. "Steve" Fullaway, E.M. 1916, died from cancer on May 25, 1980 at the age of 87.

He was born in Los Angeles on November 4, 1982. While at Mines he earned letters in baseball, football, track and rugby, and was awarded a lifetime pass to CSM athletic events in 1937.

After graduation he worked in various mines in California, Nevada, Arizona and Mexico. During World War I, he served in the Corps of Engineers as a 2nd Lt. Fullaway worked for Standard Oil Company of California for 35 years until his retirement in 1957. He was considered an expert in oil cleaning and waste water disposal and had worked in the areas of civil, petroleum, mechanical and chemical engineering.

Fullaway was active in CSMAA and assisted in recruiting students for CSM. He was selected a Fellow in the American Institute of Chemists and was a 50-year member of the Masons, 32 degree.

His wife, the former Callista McCormick, and two sons preceded him in death. One son, Robert Fullaway, five grandchildren and four great-grandchildren survive him.

### Harold W. McGowan

Harold W. McGowan, E.M. 1923, died November 12, 1979, in Laguna Hills, California.

Born in Denver on November 20, 1899, he attended Manual Training High School before entering Mines. Upon graduation he moved to California to work on the Palos Verdes Project as a draftsman. In 1926 he joined the Los Angeles County Sanitation Districts. After two years he moved to the county's Road and Highway Division, where he served until 1961. At the time of his retirement he had advanced to district maintenance engineer.

McGowan was serving as permanent secretary of the Laguna Hills Beta Theta Pi Alumni Association at the time of his death.

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### Robert R. Allen

Robert R. Allen, Met.E. 1940, died of a massive heart attack at his home on April 19, 1980.

Born November 20, 1913, in Hancock, Mich., he was the son of Maynard C. Allen, a 1906 Mines graduate. Allen spent his early years in Arizona until his family returned to Golden. He attended the University of Colorado for one year before transferring to Mines. During World War II he was employed at Wright Aeronautical Corporation in Patterson, N.J.

In 1946 he returned to Golden as an employee of the U.S. Bureau of Mines, where he continued for 20 years until his retirement. He was later employed by the State of Colorado's Civil Defense Agency at Camp George West. He retired from that position a few years ago.

He was a former member of the American Society of Metallurgical Engineers. Particularly interested in the history of Colorado mining, he was pursuing his research in this field as it concerned the Cornish miners.

Surviving Allen are his wife, the former Eileen Wagenbach, a son, daughter and step-grandson.



Robert L. Poundstone

Robert (Bob) L. Poundstone, P.E. 1941, died in Denver on June 25, 1980. He was 62 at the time of his death.

He was born in Tulsa, Oklahoma on April 6, 1918, where he attended schools prior to entering Mines. While in Mines, he was a member of ATO fraternity, AIME, ASME and participated in intramural sports all four years. During World War II he served in the U.S. Navy.

Poundstone worked for Carter Oil Company, Christensen Diamond Products Company, and with Gene Goff. Between 1956 and 1970, he operated as an independent consulting engineer out of Kimball, Nebraska. In 1970 he became associated with the Vessels Oil and Gas Company and was Vice President-Operations for this company at the time of his death.

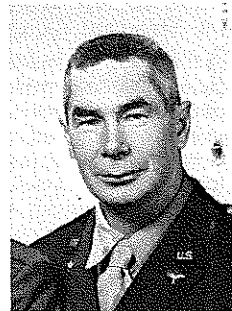
On May 15, 1943, he married G. Ruth Hayden. Surviving Bob, in addition to his wife, are a son, Michael H. Poundstone of Casper, Wyoming, a daughter, Ann P. Daniels of Denver, and a sister, Pauline Hollaway of Tulsa, Oklahoma.

Contributions may be made to the Robert L. Poundstone Memorial Fund in care of St. Luke's Episcopal Church, 1270 Poplar Street, Denver, Colorado 80220.

Many thanks to Clay Craeger, P.E. 1941, for this memorial.

### Wesley N. Farmer

Wesley N. Farmer died in March 1980, after a long illness. He attended and was often a guest lecturer at Mines. After 18½ years with Atlantic Richfield Oil Co., he moved to Denver to become vice president of Oceanic Exploration Co. At the time of his death he was chairman of the board and past president of that company. He is survived by his wife, four sons and four grandchildren.



Harold McConnell

Harold McConnell, E.M. 1926, died October 29, 1979 in Torpedo, Penn., where he was born on March 1, 1894.

He received an A.B. in Geology from the University of Oregon before entering Mines in 1923. He was employed by Alaska Juneau Gold Mining Co. until 1930 when he returned to his home town where he owned and operated a general merchandise business. During that time he was also the Postmaster for Torpedo. He retired in 1956.

McConnell was a member of the Masonic Lodge, 32 degree, and a veteran of both World Wars.

He is survived by his wife, Georgia.

### D. Lowell Kessler

D. Lowell Kessler, Geol.E. 1925, died at Mercy Medical Center in Denver at the age of 78. At the time of his death he was retired from Gates Rubber Co. where he had served for 36 years.

He was born March 19, 1902, in Red Cloud, Neb., and had lived in Denver for 70 years. He attended Manual Training High School.

Kessler was a registered professional engineer and a member of Beta Theta Pi.

He was instrumental in establishing industry standards of the American Petroleum Institute, American Society of Agricultural Engineers, Society of Automotive Engineers, Rubber Manufacturers Association, and Mechanical Power Transmission Association in the mechanical engineering specialty of power transmission. He represented these associations in the American National Standards Institute and was influential in getting their standards accepted by the national body. He also worked toward international acceptance of the American standards.

He is survived by his wife, the former Fay L. Mulligan, a daughter and three grandchildren.

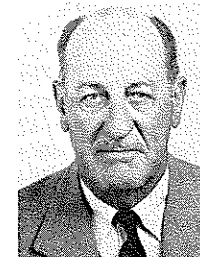
### Henry L. Conger

Henry L. Conger, E.M. 1930, died on February 2, 1980, at the Veteran's Home of California in Yountville.

He was born in DeSoto, Iowa, on November 23, 1901. After two years' service in World War I, he graduated from high school in Seattle, Washington. Following his graduation from Mines, Conger worked for several mining and engineering firms across the country.

In 1941, he was employed by the Corps of Engineers, U.S. Army, Honolulu District. He received special commendation for merit from the Corps for his work on the Johnston Island water system and radio range project. He moved to the firm of Law & Wilson, architect-engineers, in 1950 and later was employed by Portner-Urquhart, Skidmore, Owings & Merrill, Associated, on the Moroccan Air Base Project as chief engineer.

He is survived by a son and daughter.



Wayne H. Denning

Wayne H. Denning, Geol.Eng. 1926, died at his home in Morro Bay, California, on June 11, 1980. He was 83.

A native of Iowa, he was a veteran of World War I, after which he attended the University of Nebraska. In 1922 he moved to Golden and enrolled in Mines.

After graduation he worked for Midwest Refining Company in Denver until the beginning of the Depression. In 1934, he joined Western Geophysical Co. in Pasadena, where he remained until his retirement in 1953 as vice president of that company. Although officially retired he was self-employed as a consultant at the time of his death.

Denning was a member of AAPG, SEG, AGI, and Beta Theta Pi, Tau Beta Pi and Theta Tau. Between 1958 and 1962 he was planning commissioner for San Luis Obispo County in California.

He is survived by his wife, the former Betty Kimble, a daughter and three grandchildren. His first wife and two sons preceded him in death.

Many thanks to Oran L. Pack for the information above.

### Charles P. Miller

Charles P. Miller, died April 18, 1980 at his home in Hobbs, New Mexico. He attended Mines and was a member of the Professional Engineers Society. He owned and operated the Miller Engineering and Geological Co. in Hobbs. He is survived by his wife, two sons and eight grandchildren.

### Arthur E. Safe

Arthur E. Safe died April 18, 1980, in St. Joseph Hospital, Denver. He attended Mines before serving the Army during World War I. Between 1926 and 1942 he worked for Piggley Wiggley Grocery Stores, and then transferred to the U.S. Mint in Denver until his retirement in 1967. He is survived by his wife, four sons, 14 grandchildren and five great-grandchildren.

### Frank Cadena

Frank Cadena, Met.E. 1927, died May 18, 1979 at his home in San Antonio, Texas. He was 82 at the time of his death.

Born in Realitos, Texas, he received a B.A. in Chemistry and B.Sc. in Chemical Engineering from the University of Texas in 1922. He was a chemist for Cementos Hidalgo in Mexico until entering Mines in 1925.

After graduation he joined Allis-Chalmers Mfg. Co. in Wisconsin. During the depression years he served as an engineer for TWA and published a paper on Aggregate Production Methods at Hiwassee Dam. In 1944 he became manager of his father's properties in Texas and later had his own ranch. He also did occasional consulting work until his retirement in 1968.

Cadena served as an infantry sergeant in World War I. He was a former member of the American Chemical Society and AIME. At Mines he was elected to Sigma Gamma Epsilon, honorary geology fraternity.

### Charles S. Ryland

Charles S. Ryland died at his home in Golden, April 12, 1980. He attended Mines before transferring to Denver University where he earned a B.Sc. in chemistry in 1940. An employee of Coors Porcelain Co. for 35 years, he retired in 1978. At the time of his death he was writing a book for Scientific Apparatus Makers Assn. and compiling a history of Coors Porcelain ware. He is survived by his wife, the former Elsie Vogel, a son and daughter.

### Federico Videgaray

Federico Videgaray, Met.E. 1930, died December 30, 1979, at his home in Mexico.

While at Mines he earned letters in varsity baseball during four seasons and later received a lifetime letterman's pass for his service. In 1966 he was general manager for Seguetas Star de Mexico.

He is survived by his wife, Marita Elena, who still resides in Mexico.

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Howard C. Pyle

Howard C. Pyle, Hon.D. Engr. 1959, a retired petroleum executive, died in Orange, California on May 12, 1980, following heart surgery. He was 76.

Born in Arizona, Pyle grew up in Pasadena. He joined Union Oil Company of California in 1927 as a geologist and petroleum engineer after graduating from the University of Southern California at Berkeley with an MS degree in petroleum engineering. He was chief production engineer for the company when he joined the U.S. Army in January 1943. Pyle was instrumental in supplying the Allied forces with oil through portable fuel lines.

After his discharge, he joined Bank of America as vice president for petroleum financing. During his career in the oil industry he served as president of Monterey Oil Co., director of Santa Fe International Corp., and director on the board of Reserve Oil and Gas Corp.

In 1959 he was president of the American Institute of Mining Engineers and received the honorary degree of Doctor of Engineering from Mines.

He is survived by his wife, Linda, a son, daughter and five grandchildren.

LAWRENCE E. SMITH, MET.E. 1931  
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## sections

### Denver

The Denver section held its first Miner's Night at Elitch Gardens on July 17, 1980. It was a fun night for all miners and their families with unlimited rides, a miniature golf tournament and plenty of beer and soft drinks.

Approximately 25 miners and their families attended, according to Ben Mares, BSc.Pet. '73, chairman of the evening. He hopes to make it an annual event. Betty Decker, Hon. '78, was assistant coordinator.

### Grand Junction, Colorado

An "I.R.S. Blues—Readjustment" party was held April 19 for the Grand Junction alumni and guests. The pot luck supper was hosted by Sharon and Peter Rutledge, E.M. '59. The inception and culmination of this event was thanks to: Mr. and Mrs. Richard Dewey, E.M. '43; Mr. and Mrs. John Peeso, E.M. '48; and Frank Woodard, Met.E. '42.

### Pacific Northwest

The Pacific Northwest Section held its annual meeting April 18. The following is Bob Cederstrom's report of that meeting and the reactions of those attending.

"Along with the usual fun of reacquainting old members and greeting those that attended for the first time we had the pleasure of having as our guests Professors Glen Ed-



Eric Smith, E.M. '05, one of the oldest living Alumni, attends every Pacific Northwest Section Meeting.

wards and Dave Olson of the CSM Metallurgy Department. They added to the meeting the feeling that this alumni section, though many miles from Colorado, is very much part of CSM.

"We were privileged to have an excellent slide program of the school's development and activities to which each of us were able to relate. This was especially appropriate as our section spans an age group from Eric Smith, member of the class of '05, to Ken Brettman, a new student this fall.

"The Miners and their guests all agreed it was a great evening and look forward to the next meeting. Attending the meeting were: Robert Barnes, '55; Robert Cederstrom, '60; Mike Holbrook, '75; Al Nesbitt, '38; Sid Peyton, '54; Ron Schutz, '59; Eric Smith, '05; John Springer, '56; Lowell Thomas, '59; and Ken Brettman, new Mines student."

### St. Louis

Members of the St. Louis section were entertained on April 26 by Mr. and Mrs. Kai Ravnborg with a carry-in dinner at their home in Herculaneum, Missouri. The host and hostess served 'Saltinas', a Bolivian delight, along with various other appetizers and libations.

Mr. and Mrs. Clyde S. Smith showed slides, with sound commentary, of their recent visit to Europe. Smith is a retiree from St. Joseph Lead Company.

Those attending the spring dinner meeting were: Mr. and Mrs. James Kennedy, '34; Mr. and Mrs. George Bartholomees, '29; Mr. and Mrs. Jack Armstrong, '50; Mr. and Mrs. Jim Imrie, '63; Mr. and Mrs. Ed Haug, '32; Mr. and Mrs. Kai Ravnborg, '57; Doris Stuckwisch and Paul Sharp, '33; Mr. and Mrs. Tony Worcester, '64; Mr. and Mrs. Bruce Clark, '48.

### Arizona

The annual spring picnic was held in San Manuel, under beautiful azure blue Arizona skies, according to Gary Lubers. Sixty-three

people attended the pot-luck affair.

Coors beer complimented lively discussion and aided the digestion of the hearty meal. Many enjoyed themselves on the tennis courts and a few were fearless enough to plunge into the swimming pool. A rousing softball game culminated the day's activities.

In attendance was Angela Thomas, the first recipient of the Arizona Scholarship.

New officers for 1980 are: Gary Lubers, BSc.Met. '73, president; Jim Stringham, E.M. '50, vice president; Eloise Montoya Nelson, BSc.Met. '79, secretary-treasurer.

### New York

On June 25 the New York Chapter was treated to a presentation by Dr. Phil Romig, Associate Professor of Geophysics at CSM. Phil talked generally about what is going on in the geophysics department today and specifically how the department has made use of the \$5 million Resource Fund gift from the W.M. Keck Foundation.

Those in attendance were Jack Bell '49, Ed Cole '25, Peter Donovan '63, Charlie Irish '50, Mark Kinevan '75, Tom McClaren '52, Don Roberts '41, Al Schedlbauer '64, Dick Wendeborn '52, Ned Wood '48, Norm Zehr '52 and the following guests: Janice Bergmann, John M. Olin Foundation; Bill Dinsmore and Clarence Drew of Texasgulf; Bud Leeds, CSM Foundation; DuBois Morris, Council for Financial Aid to Education.

### London, England

The Westbury Hotel provided a friendly setting for the second official meeting of the organizing section in England. The meeting, held on July 4th, brought together several Miners and guests, and Patricia Petty, of the Alumni Association staff.

Gerald Berk, '62, will be heading up the group for the current term. He will be assisted by Jim Dale, '68 and John Connors, '51. John and Gerry have been active in organizing this Section, as was Millard Benson, '52, recently transferred to Angola. CSM Alumni in the area who are interested in participating in a regular meeting should contact one of these three for information on place and time.

The dinner program was occasion to celebrate the birthday of the United States, as well as the fellowship of meeting with friends and classmates. Ms. Petty brought an update from the campus, describing new buildings, and, most importantly, the new method of financing recently approved by the Colorado Legislature for the School. Using Dr. McBride's article in the March MINES Magazine as a base, she explained how tuition structures will be applied over the next few years. A number of questions about the financing plan, and other events at Mines gave rise to interesting discussion.

Plans are underway for a set schedule of meetings for this group, with programs to be held at each session.

Dennis Gregg, '50 and Mrs. Gregg were making their farewell appearance in England. Gregg has been transferred to Stavanger, Norway, by his company, Conoco, and left for that country a few days after the section meeting.

## industry news

### SME Short Course

The Continuing Education Committee of the Society of Mining Engineers of AIME will conduct three short courses on October 20-21, 1980, just prior to its Fall Meeting and Exhibit in Minneapolis, Minn. The courses include Coal Mine Ground Control, The Economics of Minerals and Energy Projects, and Professional Engineer Review Course in Mining Engineering-part 1.

### Information Research

TechSearch, a technical information and literature research company, has relocated in Lakewood, Colorado, at 1490 Ammons St. Operated by Susan Gallanter and Elizabeth Porter, it specializes in library services to the mining and energy related industry. Services include computerized and manual literature searching; document retrieval and delivery; reference work; translation arrangements; and map and patent procurement.

### Battery-powered Trucks

The benefits offered users by the new generation of battery-powered industrial trucks will be discussed in a series of one-day seminars sponsored by the Lead Industries Association. They are aimed at communicating the advantages of electric trucks to new users and those contemplating replacing their IC vehicles. Dates of the seminars are September 18, October 9 and a third date yet to be determined.

### Atkinson Acquires GE Division

General Electric Company has sold the assets of its Mining Equipment Operation to Atkinson Industries, Inc., Pittsburg, Kansas. Atkinson Industries is a major distributor of products handled by GE's Apparatus Distribution Sales Division. It has served mining and general industry for more than 60 years and plans to manufacture the newly acquired product lines in its Kansas plant.

### Merger Announced

Century Hulbert, Inc., an independent lubricant manufacturer/distributor of industrial and mining lubrication needs, was recently formed from the merging of Mayors of Nebraska, Hulbert Oil and Grease Co., and Century Oils, Ltd.

The company will soon open a specialty lubricant manufacturing plant in Kansas City. This facility, with the new western states warehousing operation in Boulder, Colorado, joins the original Hulbert facilities in Philadelphia, Marions, Ill. and nine distribution and marketing centers throughout the Eastern U.S.

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### Spillage Exercise

The 7th Annual Spillage Control Conference & Workshop will be held September 30 to October 1, in Lake Buena Vista, Florida. Co-sponsored by the Coast Guard, EPA, Florida Dept. of Natural Resources and Florida Spillage Control Assoc., it is non-profit and completely underwritten by Belcher Oil Company of Miami, a unit of The Coastal Corporation, Houston, Texas.

An oil spill will be staged in Cypress Gardens on October 1 and all conference delegates will respond as if it were the real thing. This hands-on training exercise is complemented by workshops on wildlife protection in spills, how to prevent spills and how spill control and cleanup equipment works.

### Bergbau '81

BERGBAU 81, one of the world's largest mining exhibitions, will be held on June 11-17, 1981, in Dusseldorf, West Germany. Approximately 600 different exhibitors from 25 countries will display operating equipment, parts and services, as well as the latest mining technology developed by every modern nation in the world.

International experts will be available during a five day mining congress to discuss topics such as mining technology and methods, mine management, energy development and raw material supplies.

BERGBAU 81 will address problems of tunneling in built-up urban environments for transportation and sewage disposal projects.

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Applicants must be a U.S. citizen and be any qualified individual within or outside of the Federal Service. Former Federal employees with or without reinstatement eligibility and individuals who are eligible for direct permanent appointment to the Federal Service may apply. Applicants for this position must possess the following qualifications: successful completion of a bachelor's or higher degree from an accredited college or university which included 24 semester hours in one or more of the physical sciences, or a combination of scientific/engineering or operations research education and experience which demonstrated an understanding of the principles and techniques of the position. In addition, the applicant must possess (1) managerial experience that would have demonstrated the ability to formulate goals and objectives for a major agency program and (2) demonstrated knowledge and experience in the broad areas of the physical sciences and/or related areas. The level of this experience should be comparable to that found in one year of experience at the GS-15 grade level in the Federal Service.

The candidate selected will be required to file a Financial Disclosure Report.

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PACIFIC NORTHWEST SECTION:

Standing, L-R: John Springer, Bob Barnes, Ken Brettman, Mike Holbrook, Lowell Thomas, Glen Edwards, Ron Schutz, Dave Olson. Seated: Sid Peyton, Eric Smith, Bob Cederstrom, Al Nesbitt.

## eMbers



### Playing Catch-up

All of us are familiar with that game—the stacks of mail waiting for attention, the files that “someday” will be cleaned out, the notes piling up on the spindle for things to do. We face catch-up time at MINES Magazine right now—when the whole summer’s load of information is waiting to be funneled into our editorial columns.

My personal information store approaches the overload; I enjoyed a busman’s holiday in England, visiting mines in Yorkshire and Devon, addressing a combined mining and public relations audience, talking to construction people and the head of the NUM, Joe Gormley, and much, much more. One of the highlights was attending a reception for Prince Charles, another was the get-together of Mines alumni in London. Bit by bit, all these things will find their way into the Magazine!

Information on the School is exciting—you’ll note the dramatic comments and conclusions of the Keystone Conference on page 19. New faculty, new plans, new percentages—as, for example, the fact that almost 20% of the entering Freshman class is female. The Colorado Legislature passed the enabling laws to allow us to control our own financial destiny, resulting in a much wider opportunity to upgrade the quality of education at Mines, and the responsibility of setting our own tuition structure. This, also, will be more fully developed in the Magazine.

For all of us, the information load on politics has been more than can be comfortably digested. Two major conventions, intra-party wrangling, the ridiculous asininity of “Billygate,” and the contradictory promises of the candidates add up to more silliness than substance. The “real” campaign, as opposed to the pre-convention maneuvering to which we have been subjected, will now be winding up in earnest.

I was in England when the Venice conference ended, and when Mr. Carter made his statement on increased coal production in the United States. To-

gether with the questions on handling of the Iranian crisis, the artificially controlled price on gasoline and was Rosalyn actually the power behind the President, I then had to try to respond to the question of the capability of the United States and the coal industry to deliver on the increased production promise. I am a sceptic. I am also, I think, a realist. It, therefore, seemed to me that I had to reply that, under our existing regulations and restrictions, that it would be impossible for the U.S. to meet that commitment. Sir Derek Ezra, head of the National Coal Board, was one of the many who asked this question and received this answer.

There is a distinct feeling of uneasiness in defending or explaining the policies of one’s country, foreign or domestic, while a visitor in another country. I would have liked to have said, “Yes, of course, we will do just what he promised.” I *could* have said, “The industry is capable of doubling coal production”—a truth, but not the full story. So, reluctantly, I had to say that I felt Mr. Carter was in error.

When I returned to Colorado, I spent a day in Paonia, at the Orchard Valley Mine of Colorado Westmoreland Co. A stray piece of knowledge came my way that day which made me feel less uneasy in my response. The Orchard Valley Mine has, in part of its area, a 27 ft. coal seam. In accordance with government regulations, under the current Federal Lease regulations, only 12 feet of that coal can be mined. Using a conventional room and pillar method of extraction, the remaining coal will be effectively lost, as pillars are pulled and the coal removed. Should there be a need for this coal in the future, the cost of reentry into the mine would be economically unfeasible and geologically uncertain.

Another surrealistic aspect of this is a stipulation that only when a company has a signed contract for sale of a certain amount of coal can a Federal lease be awarded to mine that amount. Even though Orchard Valley has the capacity for processing 2.5 million tons of coal, there was no signed contract for that amount. The lease awarded the company, therefore, allowed only 500,000 tons on one lease and 750,000 on another. The result is easy to see—coal stays in the ground, coal for which there is now a market, employment possibilities for the area are curtailed, and the benefit derived from the extra tonnage of 7% ash, .44% sulfur coal is lost. (This premise has been tested in court; NRDC vs. Hughes, and upheld by a Federal judge).

These examples, bizarre as they may seem, are not anomalous. They are, in fact, representative of many such situations in coal development. They are the

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best kind of evidence that we shall not, as I reluctantly told my English hosts, fulfill the Venice promise.

In 1974, the National Coal Board announced a long-range energy plan, designed to utilize as completely as possible the country’s excellent reserves. This was undertaken in spite of the fact that England had tremendous reserves of oil in the North Sea, and has been pursued in the face of new oil reserves recently announced. Recognizing the differences in development when undertaken by a nationalized industry, the likelihood of lower production—all of the criticisms which those of us in the private sector would level at such an industry, it still seems strange that the 1974 British coal plan is moving ahead, and that the United States still lacks a comprehensive coal development plan or goal.

With the seeming lack of understanding of many major political candidates today in reference to resource development, it is important to sift out from all the campaign rhetoric, if possible, that which could help us formulate such a policy. Keeping in mind the wise course of orderly development, as opposed to a crash program when the panic hits, we must look for the candidate who will try to apply economic and orderly rules to the development of our resources. We cannot afford to get to the end of this century and discover that Carter’s promise was indeed wrong.

We’re playing catch-up in a very dangerous game.

*Patricia Curtis Petty*

—mm—

the mines magazine • september 1980

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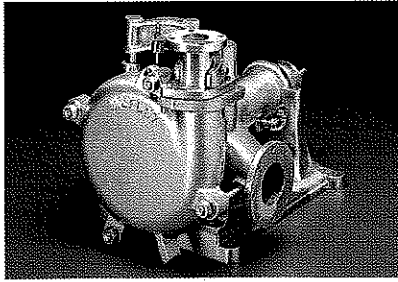
### Lime mud. And the economics of making paper.

Abrasive lime mud solution is critical to the efficient production of paper. Improperly diluted, it costs the producer valuable time and money to dry and reprocess. That's a pumping problem paper mills, and a lot of other industries, could do without. One that's easily solved with a Wilfley pump.

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costly downtime. No more annoying repairs on worn out packing and mechanical seals. And most important, no more dilution.



Wilfley pumps are designed for both corrosive and abrasive applications. They're made from a wide variety of quality materials, including cast irons, alloys and stainless steels. And if metal isn't right for your job, we'll make it from something that is. Plastics. Or rubbers.

Or synthetic elastomers. Any one of 80 different materials. In a complete range of sizes.

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# WILFLEY

# Pumping lime mud without dilution saves money. Wilfley makes it work.

