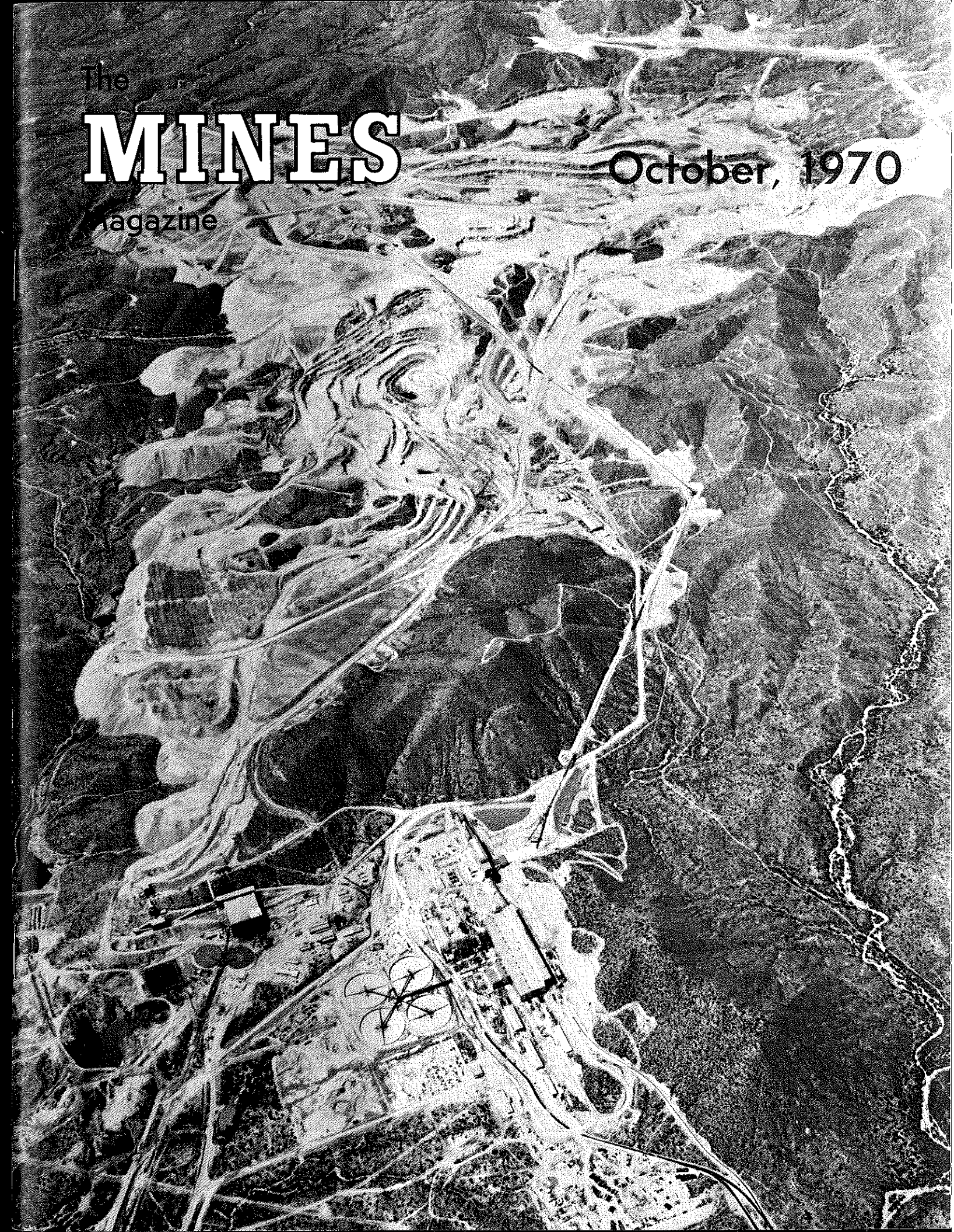


The

MINES

Magazine

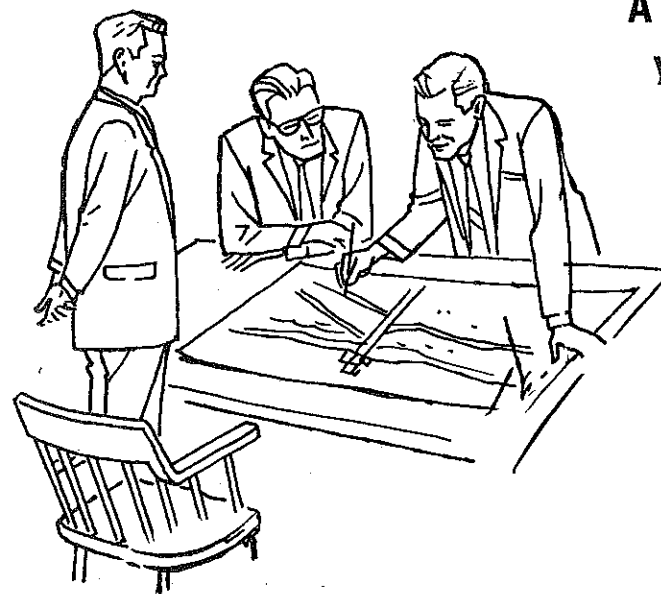
October, 1970



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THE MINES MAGAZINE

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Calendar

Society of Petroleum Engineers of
AIME Annual Convention, Hous-
ton, Tex., Oct. 4-7.

SPI Midwest Conference, sponsored
by Society of Plastics Industry,
Playboy Club Hotel, Lake
Geneva, Wis., Oct. 6-9.

Fall Technical Conference of Amer-
ican Society of Photogrammetry
and American Congress on Sur-
veying and Mapping, Denver Hil-
ton, Oct. 7-10.

1970 Metals Show, sponsored by
Society of Metals, Public Audi-
torium, Cleveland, Ohio. ASM
headquarters at the Sheraton-
Cleveland, Oct. 19-22.

52nd ASM Materials Engineering
Congress and Exposition, Cleve-
land, Ohio, Oct. 19-22.

SME Fall Meeting and AIME World
Lead Zinc Symposium, Kiel Audi-
torium, St. Louis, Mo., Oct.
21-23.

Symposium on Inorganic Applica-
tions of Automated Analysis,
sponsored by the Technicon In-
ternational Congress, New York
Hilton Hotel, New York City,
Nov. 2-4.

8th Annual Reliability Engineering
& Management Institute, spon-
sored by Univ. of Ariz. and
General Electric Co., Tucson,
Ariz., Nov. 2-11.

Fall Symposium of West Texas
Geological Society and Univer-
sity of Texas, "Geologic Frame-
work of Chihuahua Tectonic
Belt," in honor of Prof. Ronald
K. DeFord, E.M. '21 M.Sc. '22
and Medalist '63, Scharbauer
Hotel, Midland, Tex., Nov. 4-6.

Seminar on Pollution ("For Land's
Sake"), sponsored by Environ-
mental Sciences Inc., Pittsburgh,
Pa., Nov. 9-11.

76th Annual Convention of North-
west Mining Assn., Davenport
Hotel, Spokane, Wash., Dec. 4-5.

Underwater Mining Institute, Down-
town campus of Univ. of Wis.,
Milwaukee, Wis., May 20-21,
1971.

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The MINES Magazine

Volume 60

October, 1970

Number 10

Front Cover

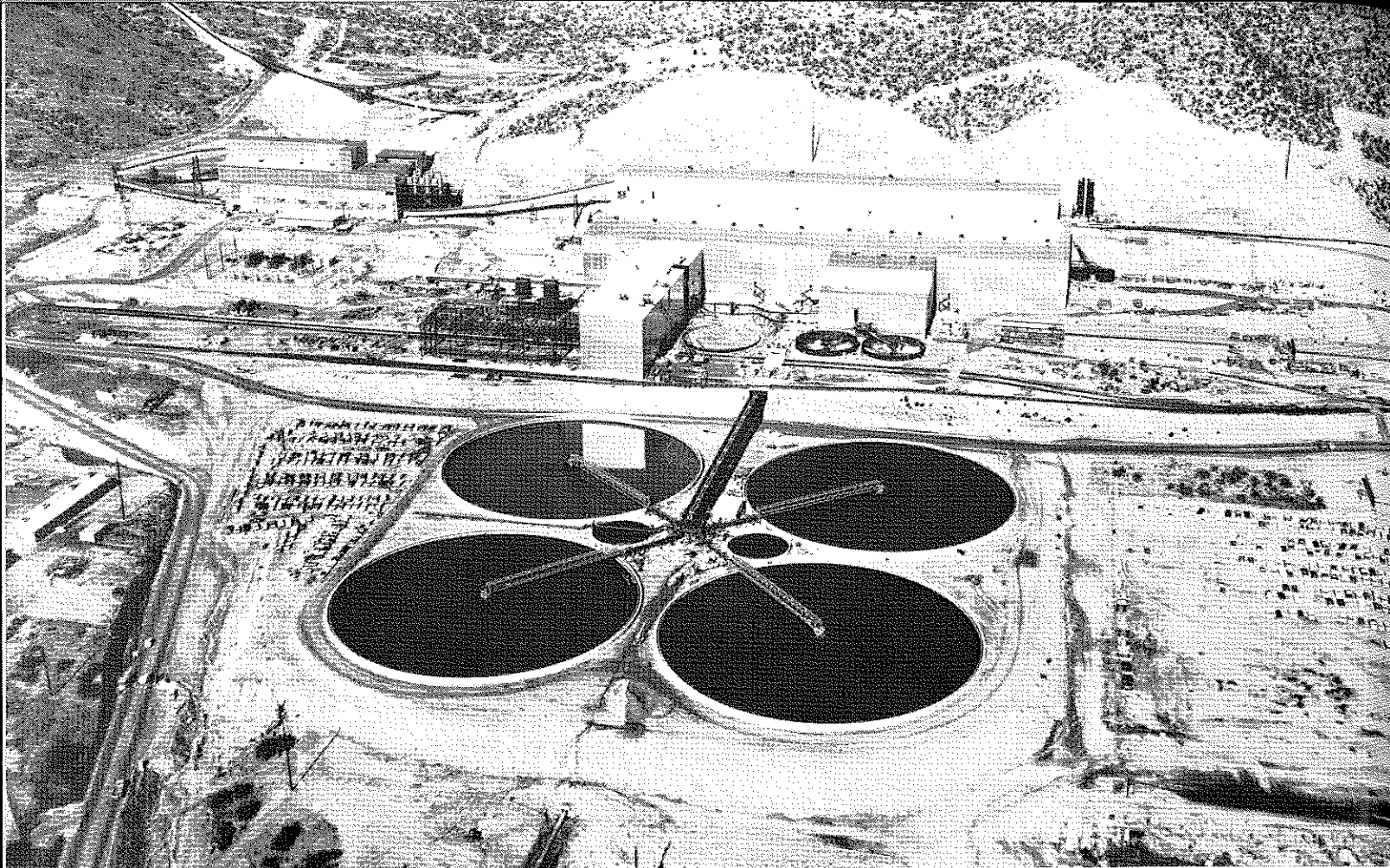
Aerial view of Duval Sierrita and Esperanza Properties.
Copper-molybdenum ore from the Sierrita pit (upper center)
travels two and one-half miles on a 54-inch belt conveyor
system to the Sierrita mill (lower center.)

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DUVAL SIERRITA MILL FACILITIES FOR COPPER AND MOLYBDENUM. Four 350-foot diameter rake tailing thickeners in the foreground reclaim water from the slurry for re-use.

Sierrita Says It Big!

It's name stands for "little" mountain in Spanish, but don't let that fool you. Duval could dig two Panama Canals with the effort it will take to extract Sierrita's copper-molybdenum-silver ore.

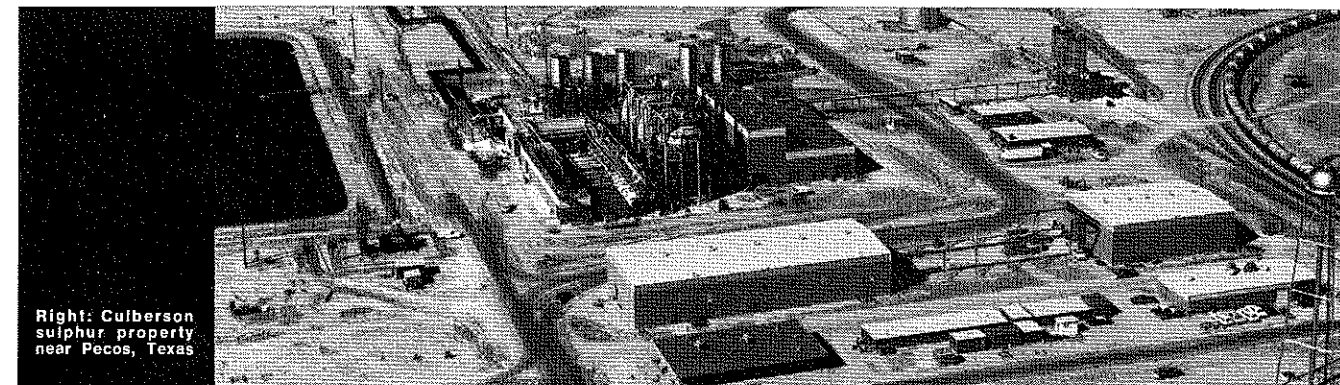
You couldn't find a prettier place to build anything." From a jagged crest in the Sierrita Mountains of southern Arizona, the words came easily for S. H. (Ham) Martin, general manager of metallic operations for Duval Corporation. What he saw even from this vantage point, however, was only a portion of Duval Sierrita Corporation's \$166 million copper-molybdenum-silver property now coming into initial production after 25 months of pre-mining, mill construction and other work. Unless airborne, there is no single vantage point from which you can see all of Sierrita.

The beauty Ham Martin described came from the slowly changing hues as the morning sun brushed the mountainsides. It came, too, from the Santa Cruz river valley to the east and from nature's mix of cholla (jumping cactus), palo verde trees and the ever present mesquite that dot this rugged region of the Southwest.

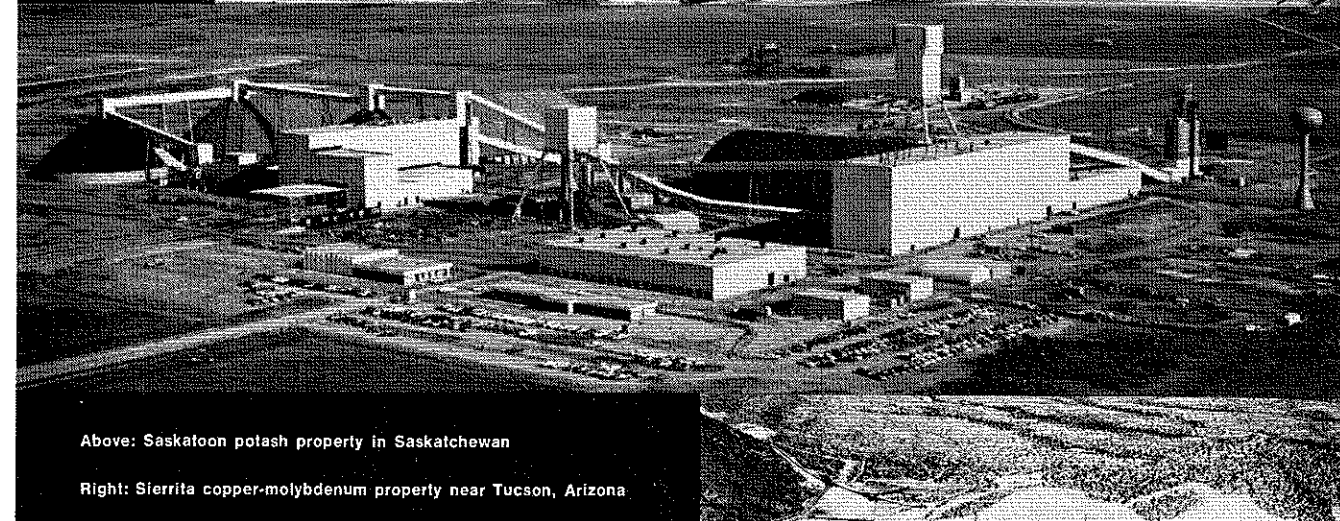
In terms of total investment and sheer size it is the largest mining property ever developed by the company. Sierrita will—

- Process 66,000 tons of ore daily
- Become the largest copper mining and milling facility in Arizona and the second largest in the U. S.
- Make Duval the second largest domestic producer of molybdenum
- Mark fulfillment of a cooperative effort between private enterprise and the federal government
- Provide some 1,100 permanent new job opportunities for residents of the area in the company's mining and milling operations

Sierrita's role in future revenues for Pennzoil United can also be told without great length: expected copper output of some 130 million pounds per year during its first five years of production and 150 million pounds annually
(Continued on Page 6)



Right: Culberson sulphur property near Pecos, Texas



Above: Saskatoon potash property in Saskatchewan

Right: Sierrita copper-molybdenum property near Tucson, Arizona

Three More Duval Properties Go On Stream

We are very proud of our three new facilities which came on stream during 1969 and 1970. They are the Culberson sulphur property near Pecos, Texas; the Saskatoon potash property in Saskatchewan; and the Sierrita copper-molybdenum property near Tucson, Arizona. These three properties represent an investment of more than \$300 million in new mining facilities.

In addition, Duval is producing at the Wills-Weaver and Nash Draw potash properties near Carlsbad, New Mexico; the Esperanza copper-molybdenum prop-

erty near Tucson; the Mineral Park copper-molybdenum property near Kingman, Arizona; and the Battle Mountain copper property in Lander County, Nevada.

Duval's interest in hard minerals is not limited to those currently being produced. We have mineral rights to significant deposits of other minerals, and we are searching over the world for other deposits of hard minerals which would offer economic rewards in today's competitive environment.



CORPORATION

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POWER SHOVEL BUCKET drops approximately 23 tons of copper-molybdenum ore into 1000 HP haul truck. When fully loaded, the haul truck will carry 120 tons of ore. Each truck tire is 48-ply, stands nine feet high and weighs 3000 pounds.

in subsequent years; plus 13 million pounds of molybdenum annually; plus approximately 500,000 ounces of silver a year.

None of which will be done easily or cheaply. Sierrita's 414 million ton ore body has an average content of 0.35% copper and 0.036% molybdenum—levels considered unprofitable to mine only a few years ago. The world's growing need for copper, plus rapidly improving technology, however, has brought about a re-evaluation of the economics of developing such low-grade ore deposits.

As Resident Manager J. P. McCarty puts it, "We'll get everything out but the squeal." Judging from the gargantuan equipment now roaming this rugged mine site 24 hours a day, and a layout of ore processing facilities as modern as any in the world, there is no reason to doubt his view.

Sierrita's closest business address would be tiny Sahuarita, Arizona, which straddles U. S. Highway 89 some 20 miles south of Tucson and only 47 miles north of the Mexican border. Sahuarita's two taverns, one grocery, one service station and a post office offer a rather sleepy facade for the busy mining operations that go on in the mountains only a few miles away.

Duval put its first metals property (Esperanza) in production in 1959 approximately ten miles southwest of Sahuarita. Even while the Esperanza open pit copper-molybdenum mine was being readied for production, Duval's exploration team continued to investigate and make ore evaluations of the surrounding region—and to purchase additional mining claims. The team laid the foundation for this \$166 million Sierrita project that has now been developed just west of the Esperanza mine.

The Sierrita Property consists of over 13,000 acres. Included in this total acreage are 143 unpatented mining claims which were purchased by Duval. Approximately 58 percent of the Sierrita ore body was acquired in the pur-

chase of these claims. The remaining 42 percent of the ore body was controlled by patented mining claims owned by Duval. Duval has transferred these patented claims to Sierrita.

A total of 178 test holes were drilled in order to delineate the Sierrita ore body and to test proposed waste dump areas. Some of the tests were drilled to check certain holes drilled by another mining company which had previously drilled 60 core tests in the area.

The exploration and preliminary development program delineated an ore body of 414 million tons with an average copper content of 0.35 percent (seven pounds per ton) and an average molybdenum content of 0.036 percent (0.72 pounds per ton). Engineering pit design indicates that a total of 634 million tons of waste must be handled prior to and during the mining of the 414 million-ton ore reserve. This total of over a billion tons of ore and waste which will be mined, of which 131 million tons were removed during the pre-mine stripping operations, represents more than twice the tonnage excavated in the construction of the Panama Canal.

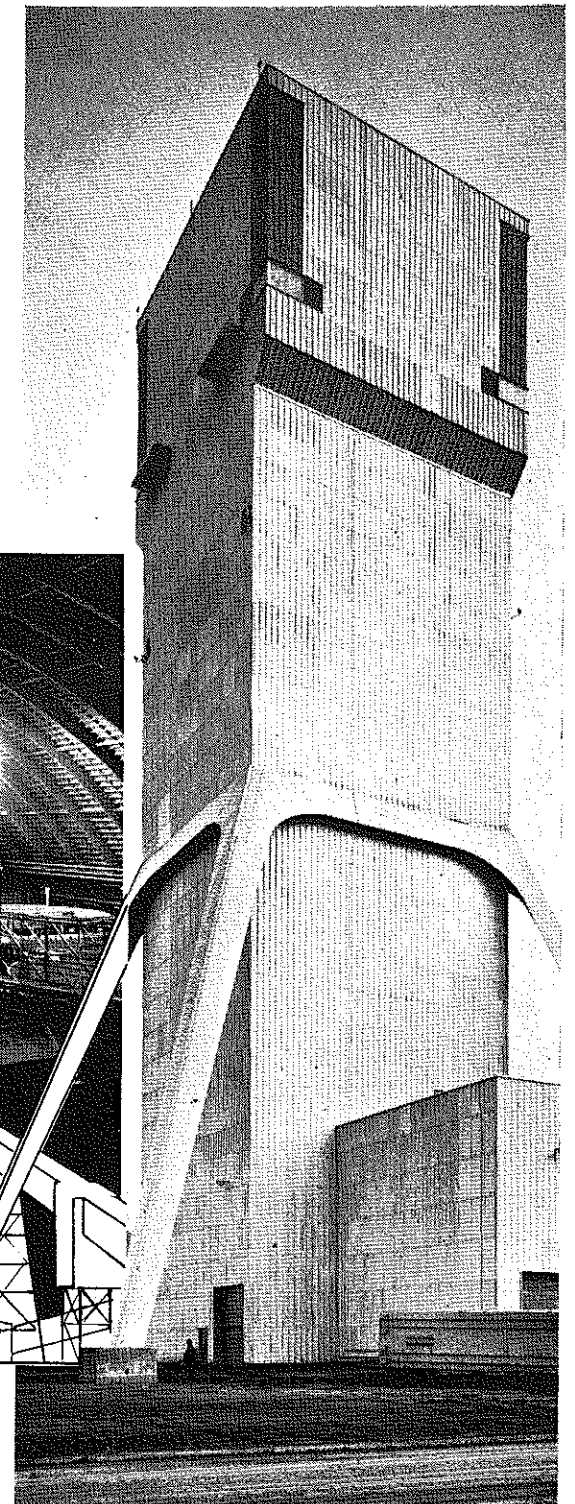
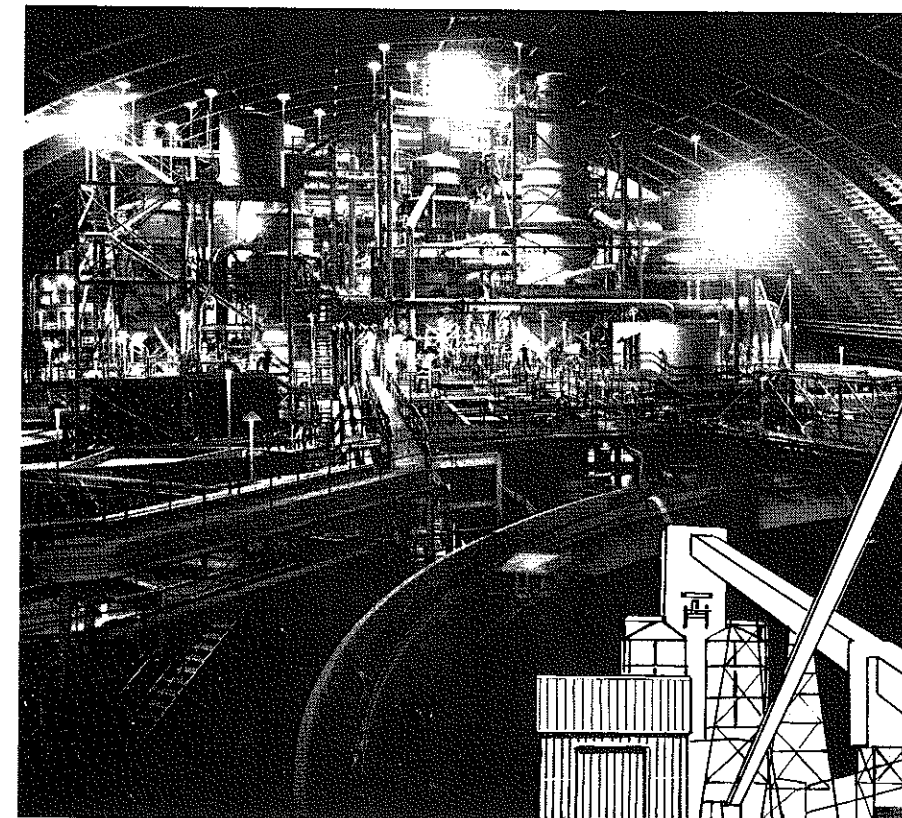
Mining—It is anticipated that the eventual perimeter of the Sierrita open pit will encompass an area of approximately 460 acres. As presently designed, the pit will ultimately reach a depth of 1850 feet below the highest elevation of the pit area prior to mining. Such an ultimate depth will represent a distance of almost one and one-half times the height of the Empire State Building.

Mining is accomplished by establishing a series of levels or benches, each bench being approximately 50 feet high. The first step in the mining cycle is the blasting of the various benches. To blast a bench, rotary drills drill holes 59 feet in depth and from nine inches to 12¼ inches in diameter.

(Continued on Page 8)

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Blast holes which contain water are loaded with a gelatin explosive in slurry form. Holes which are dry are loaded with a mixture of ammonium nitrate and fuel oil.

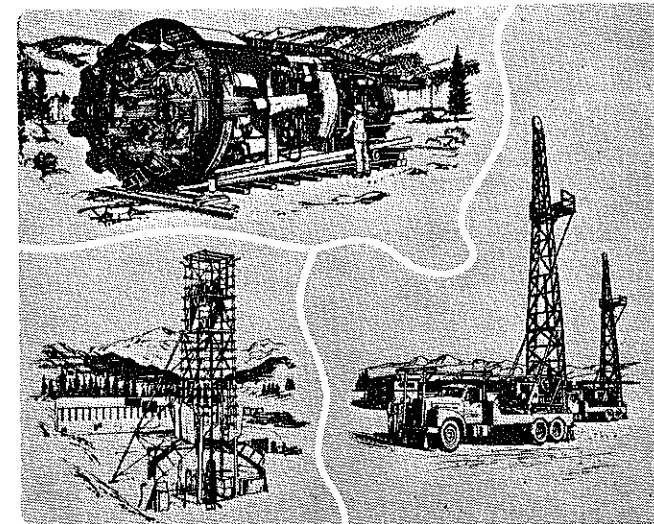
A typical blast consisting of detonation of the explosives in 40 blast holes requires 75,000 pounds of explosives to break 200,000 tons of rock. A blast of this size provides enough broken material to keep one power shovel in production for approximately four days.

Mining Equipment and Facilities—The mining equipment features six power shovels equipped with 15 cubic-yard buckets and 32 haul trucks of 120-ton capacity. These shovels and trucks are among the largest presently used in the copper mining industry. In addition, six rotary blast-hole drills, 12 dozers and numerous other units such as motor patrols, fork lifts, cranes, water trucks, personnel busses and miscellaneous small trucks supplement the operation. Service facilities consist of two modern shops, steam cleaning pad, change room and offices.

Because the power shovels and haul trucks are among the largest used in the industry, some pertinent facts concerning these units are of interest.

Power Shovels—1. The weight of each shovel is approximately 450 tons; 2. Shovels are rated at 750 HP and are electrically powered by 4160-volt alternating current motors; 3. The 15 cubic-yard bucket has a capacity of approximately 23 tons.

Haul Trucks—1. The truck engines are 12-cylinder diesels rated at 1000 HP; 2. The truck engine drives a direct current generator, which supplies power to electric motor assemblies in the rear wheels; 3. Trucks have a rated capacity of 120 tons and weigh approximately 75 tons empty; 4. Fuel tanks hold 450 gallons of diesel oil and the engines use one gallon per mile under full-load conditions and evel haul; 5. Truck tires are 48-ply, nine feet in diameter and weigh 3000 pounds; 6. The expected life of each truck is five to seven years, after which replacement is anticipated.



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Plant Facilities—The concentrator, which has a design capacity of 72,000 tons of ore per day, and its associated facilities are expected to cost approximately \$100 million. This capacity will be greater than that of any single copper-molybdenum concentrator in North America. The construction of plant facilities, as originally designed, were completed by mid-1970. In May, 1970, an agreement was reached with the GSA for a \$12 million expansion at the Sierrita Property. This expansion program, when completed in 1971, is expected to increase significantly the mining and milling capacity at the property.

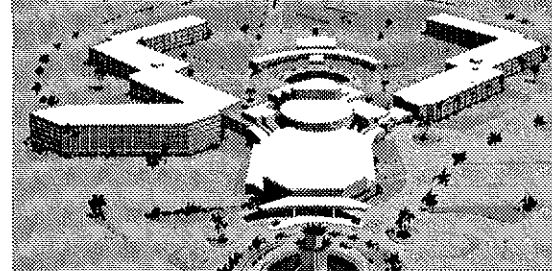
Crushing—Primary size reduction of the mined ore is achieved by two 60-inch by 89-inch gyratory crushers located near the south perimeter of the Sierrita open pit. The crushers, which reduce the mine ore to about 85 percent minus six-inch, have a total operating capacity of 5000 tons-per-hour. The crushed ore is transported by a 54-inch wide belt conveyor to a 40,000-ton coarse ore open storage—an overland distance of about two and one-half miles.

Feeder belts under the coarse ore pile collect the ore to feed the fine-crushing plant. Ore is first fed to four vibrating double-deck scalping screens ahead of four 84-inch secondary crushers. The secondary crusher product is again screened, and the oversize material is further reduced by eight 84-inch tertiary crushers operating in a closed-circuit system consisting of a 2400-ton surge bin feeding the crushers and vibrating screens. The finished product, essentially all minus half-inch, is transported to a 72,000-ton live capacity fine-ore bin located in the concentrator building.

Concentrating—The process of flotation is used to concentrate the copper and molybdenum minerals. To accomplish this, the crushed ore must be further reduced by grinding to achieve liberation of the mineral particles from the host rock.

(Continued on Page 10)

HERE'S WHERE ALL THE LIFE IS!



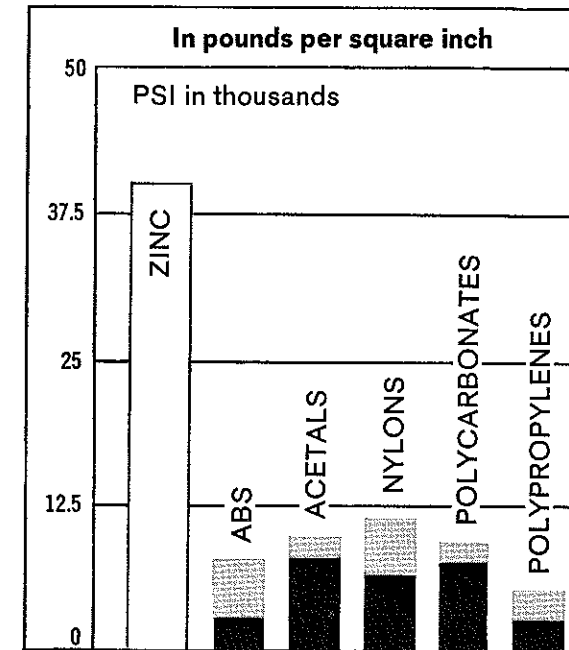
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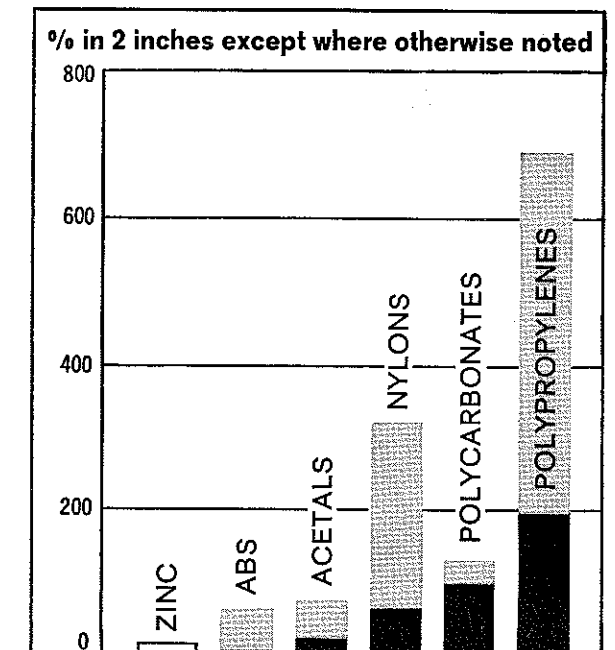
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BASIC DESIGN DATA—Zinc Die Castings vs. Plastics

Tensile Strength



Elongation



ZINC DIE CASTINGS	TENSILE STRENGTH—psi	
	As Cast	After 20 yrs.
Alloy SAE903, ASTM AG40A, No. 3	41,000 ⁽¹⁾	32,000 ⁽²⁾

Source (1) ASTM B86 (2) Reports of ASTM Comm.

ZINC DIE CASTINGS	% ELONGATION 2 in.	
	As Cast ⁽¹⁾	After 20 yrs. ⁽²⁾
Alloy SAE903, ASTM AG40A, No. 3	10	14

Source (1) ASTM B86 (2) Reports of ASTM Comm.

SOME PLASTICS USED FOR INJECTION MOLDING	TENSILE STRENGTH ⁽³⁾ —psi	
	As Molded	After 20 yrs.
ABS { High Impact High Heat Resistant Medium Impact	3,500-8,800	Not Available
ACETALS { Homopolymer Copolymer	8,800-10,000	Not Available
NYLON (Type 6, 6/6, 6/10)	7,000-12,400	Not Available
POLYCARBONATE (Unfilled)	8,000-9,500	Not Available
POLYPROPYLENES (Unmodified Copolymer)	2,900-5,500	Not Available

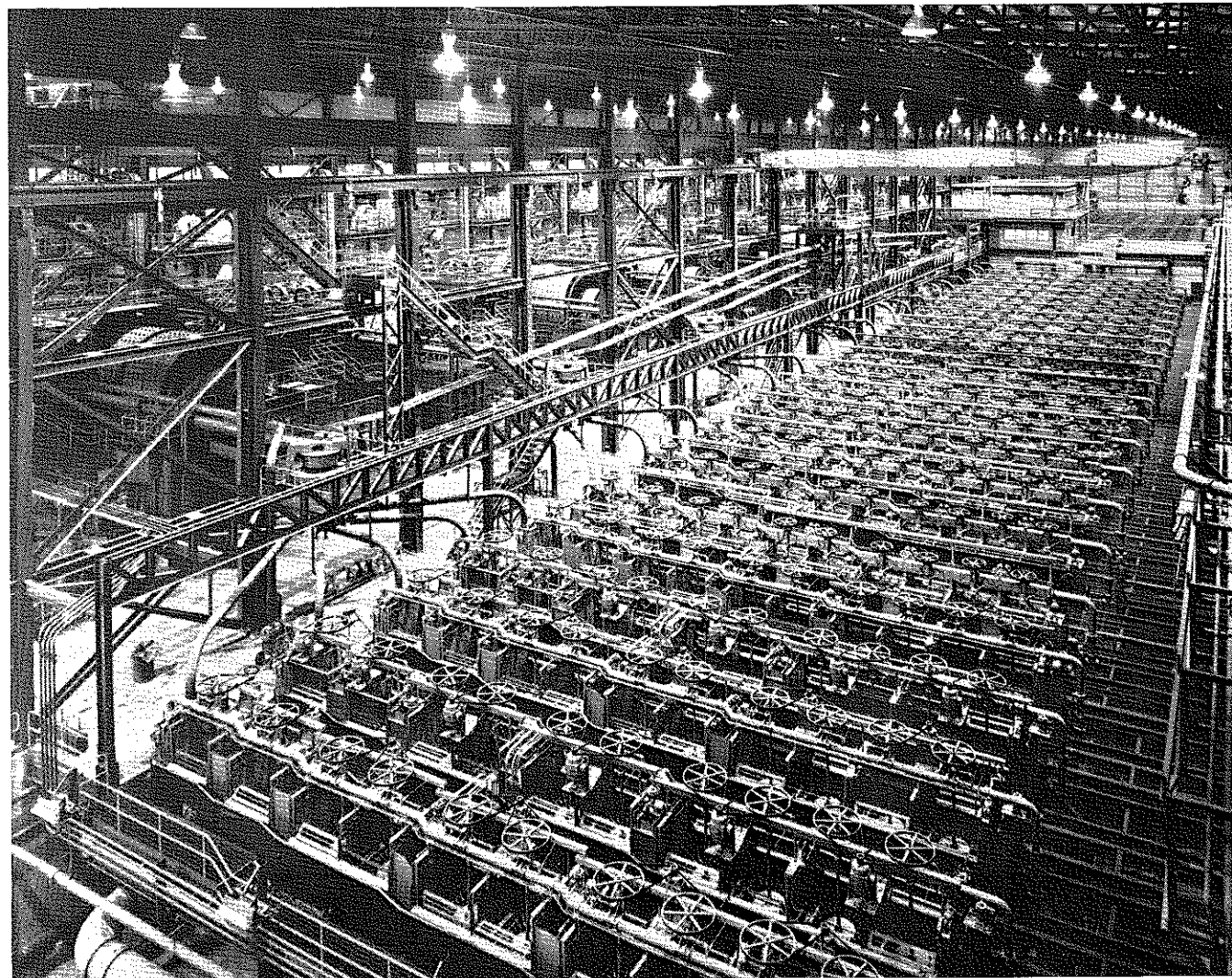
Source (3) Modern Plastics Encyclopedia- 1969-70

SOME PLASTICS USED FOR INJECTION MOLDING	% ELONGATION 2 in.	
	As Molded ⁽¹⁾	After 20 yrs.
ABS { High Impact High Heat Resistant Medium Impact	3-60	Not Available
ACETALS { Homopolymer Copolymer	28-75	Not Available
NYLON (Type 6, 6/6, 6/10)	60-330	Not Available
POLYCARBONATE (Unfilled)	100-130	Not Available
POLYPROPYLENES (Unmodified Copolymer)	200-700	Not Available

Source (3) Modern Plastics Encyclopedia- 1969-70

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CONCENTRATOR BUILDING IS NEARLY AS LONG AS THREE FOOTBALL FIELDS. Final ore grinding takes place in the 14 cylindrical ball mills (left center). The ground copper-molybdenum ore then goes to the 602 flotation machines (foreground) where it is separated mechanically and concentrated.

The ore from the fine-ore storage is wet-ground in 14 16½-foot diameter by 19-foot-long ball mills driven by 3000 HP motors. The ball mills operate in a closed circuit with cyclone classifiers. The ground ore in an ore-water slurry, after being conditioned with reagents, is introduced into flotation machines which produce a low-grade (rougher) concentrate of copper and molybdenum minerals.

The rougher concentrate is then re-ground in two 11-foot diameter by 15-foot-long regrind ball mills that are operated in a closed circuit with cyclone classifiers. The rougher concentrate is floated and re-floated to a final concentrate. A total of 602 flotation machines are used in the copper-molybdenum concentration. The tailing from the flotation process is thickened before disposal in four 350-foot diameter rake thickeners, the water, which is recovered from the slurry, is re-used in the process. The concentrate is thickened in 100-foot diameter thickeners.

The combined copper-molybdenum concentrate is then subjected to flotation to separate the two products. The concentrate is steamed and conditioned with reagents before flotation. In the first flotation, the copper minerals are depressed and the molybdenum floated. The copper concentrate is the tailing from this flotation and, after thickening in a 125-foot diameter thickener, is de-watered in four drum filters and loaded in open gondola railroad cars for transporting to the smelter. The molybdenum is further concentrated by cleaning and re-cleaning stages

of flotation. The final molybdenum concentrate is filtered, dried and stored for packaging for marketing as molybdenum sulfide or for roasting in two 23½-foot diameter multiple-hearth roasters. The roasted product, molybdenum trioxide, is packaged and marketed as technical molybdenic oxide.

Production—Production from the Sierrita Property as originally designed is expected to average 130 million pounds of copper annually during the first five years of operation and 150 million pounds thereafter. In addition, the property will produce approximately 13 million pounds of molybdenum and 500,000 ounces of silver annually. With Sierrita's production, Duval Corporation will rank fourth among United States copper producers and will be the second largest producer of molybdenum in the United States. Peak employment during development of the Sierrita Property was 2400. Average employment during production will be 1100.

Utilities—Electric power and natural gas is supplied by a local utility company. Power requirements are expected to be approximately 60,000 kilowatts or 40 million kilowatt-hours per month. This amount of power would supply a city of 100,000 population.

Natural gas requirements are expected to be some 50 million cubic feet per month with all but a fraction of the gas being used in roasting molybdenum sulphide concentrate into the oxide form.

When you can hardly hear yourself think, it's time to think about noise.

Noise won't kill you. But before it leaves you deaf, it may drive you crazy.

Noise is pollution. And noise pollution is approaching dangerous levels in our cities today.

People are tired of living in the din of car horns and jackhammers. They're starting to scream about noise.

Screaming won't help matters any. But technology will. Technology and the engineers who can make it work.

Engineers at General Electric are already working to take some of the noise out of our environment. One area where they're making real progress is jet-aircraft engines.

Until our engineers went to work on the problem, cutting down on engine noise always meant cutting down on power. But no more.

GE has built a jet engine for airliners that's quieter than any other you've ever heard. A high-bypass turbofan. It's quieter, even though it's twice as powerful as the engines on the passenger planes of the Sixties.

And NASA has chosen General Electric to find ways of cutting engine noise even further.

It may take an engineer years of work before he can work out the solution to a problem like noise in jet engines. And it may be years before his solution has any impact on the environment.

But if you're the kind of engineer who's anxious to get started on problems like these and willing to give them the time they take, General Electric needs you.

Think about it in a quiet moment. Or, better yet, a noisy one.

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A bucket wheel excavator, shovel, and draglines are used by Derek Crouch to recover 6 seams of coal, from 15 to 56 in. thick, between outcrop and a maximum depth of 230 ft on the Radar North project in Northumberland County, England. Restoration immediately follows excavation

Surface Mining & Restoration English-Style*

By R. K. Singhal
B. Sc. (Mining), Ph.D.

One of the more interesting as well as one of the largest opencast coal mines in Europe is the Radar North project at Widdrington, near Morpeth, in Northumberland County, England. Operated since 1957 by Derek Crouch (Contractors) Ltd. under contract to the National Coal Board, it is the center of an area estimated to have 30 million tons of coal.

The 2,000-acre Radar North coal site which stretches for 5 miles along Druridge Bay on the North Sea, about 23 miles due north of Newcastle upon Tyne, is expected to produce more than 10 million tons of good quality coal. It is presently producing at the rate of more than 25,000 tons per week.

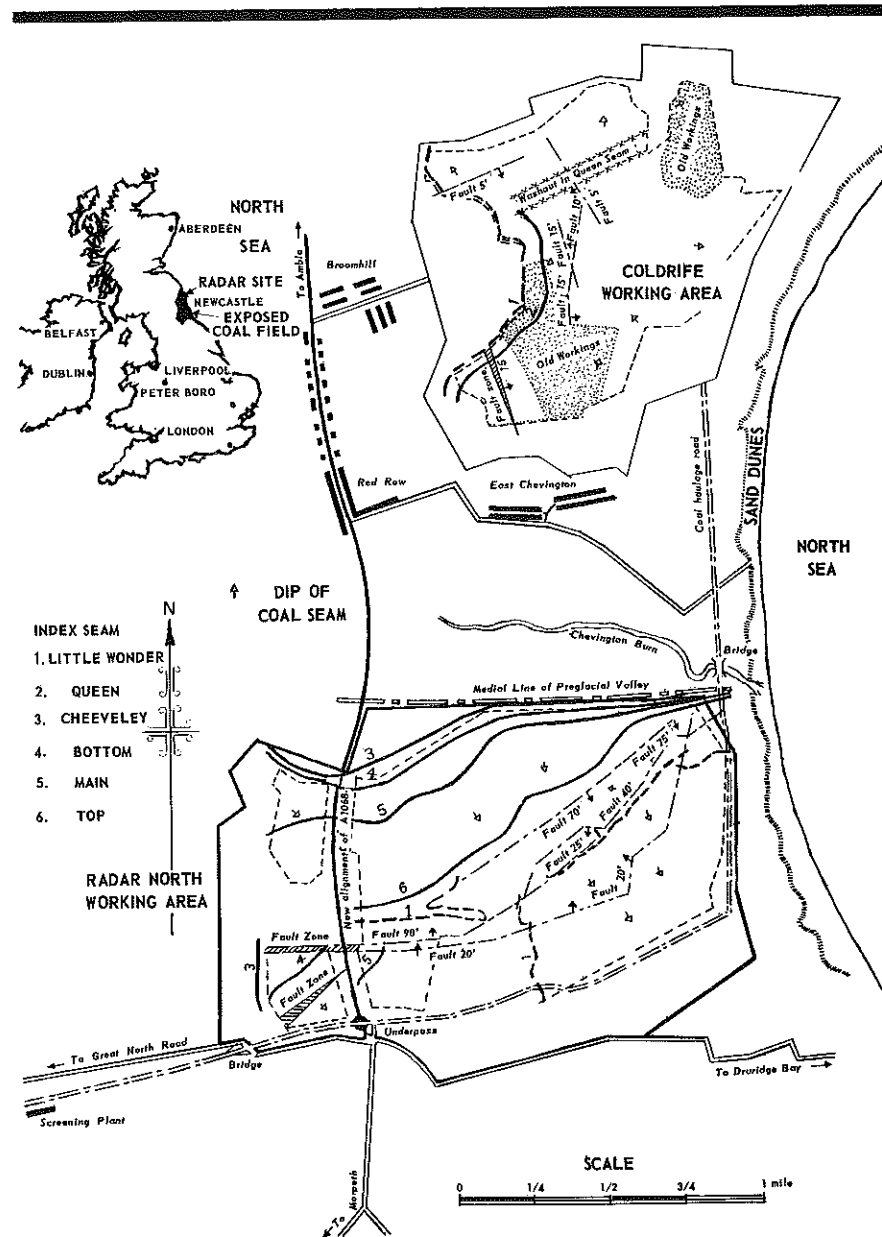


Fig. 1 (above)—Geologic details and surface features of the Radar North project

Fig. 2 (right)—Excavation sequence in the Radar North and Coldrife working areas

This will involve the moving of 200 million cu yd of overburden material consisting of surface soil, boulder clay and rock, then restoring the area according to a prearranged plan.

Regional geologic conditions

Fig. 1 provides geologic details of the Radar North project as well as certain physical features of the area.

The Radar North and adjacent Coldrife working areas, both part of the same project, contain some of the best general purpose coals available in Northumberland. These find ready

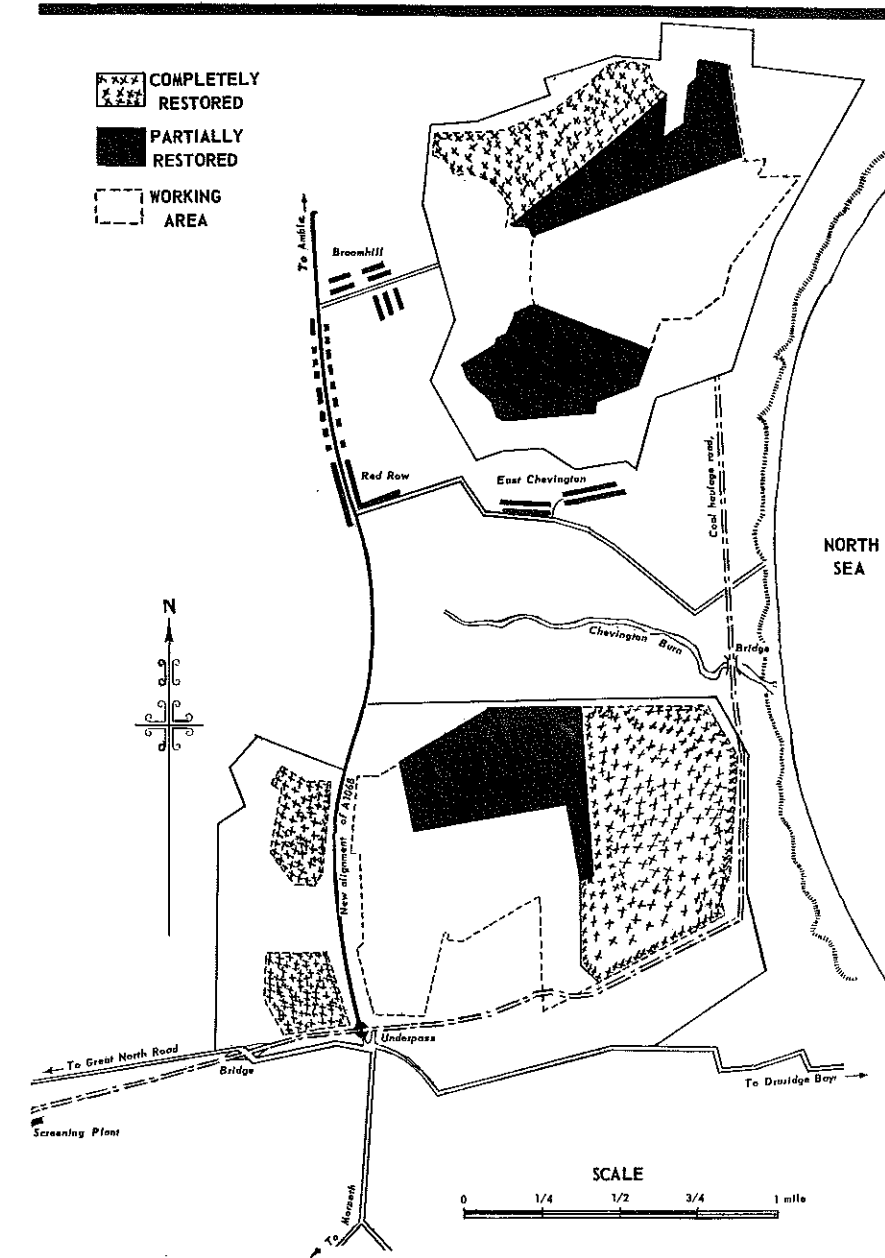
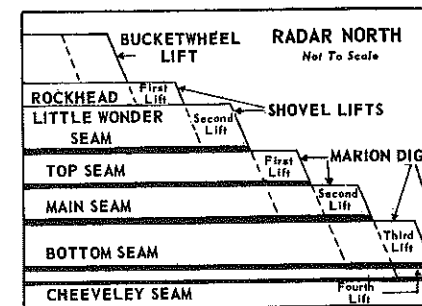
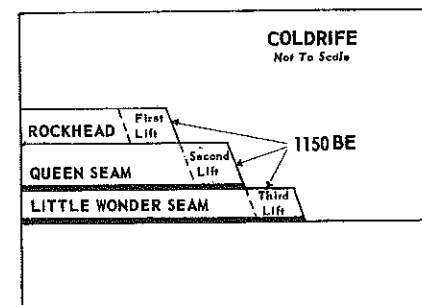


Fig. 3 (above)—Progress in restoration of the Radar North and Coldrife working areas

market in both power generation and export trade.

The area involved is located near the extreme northeast rim of the Northumberland Coal Field. The six seams which outcrop in the area occupy horizons in the lower half of the Middle Coal Group in the Productive (Carboniferous) Coal Measures.

As the direction of regional full dip is southeasterly, the outcrops trend in a northeast-southwest direction. They dip at a rate of 1 in 10 to 1 in 20 eastward toward the North Sea. To recover these coals it is sometimes necessary to remove overburden to a depth of 230 feet, thereby making those portions of the pits 200 feet be-

low sea level.

All of the outcrops are buried beneath varying thicknesses of glacial material (boulder clay) from a few feet to 130 feet in depth, but generally from 40 to 60 feet. The greater depths are the result of a complex of preglacial buried valleys from 90 to 130 feet deep which traverse the area.

The land surface is relatively flat, being a coastal plateau. The configuration and occurrence of the coal seam outcrops are ostensibly the product of structural factors.

The seams, identified by name as well as number in Fig. 1, have the following average thicknesses:

1. Little Wonder—27 in.
2. Queen—48 in.
3. Cheeveley—15 in.
4. Bottom (of Broomhill)—25 in.

5. Main (of Broomhill)—56 in.
6. Top (of Broomhill)—32 in.

Coldrife geology

This area lies north of a major fault known as the Causey Park Dyke. The fault, which has a WSW-ENE trend, separates Coldrife from Radar North which presently is working about 1½ miles to the south.

The Coldrife area is generally free of major faulting, but prospecting operations have indicated several NW-SE trending faults with throws up to 15 feet and additional minor faults at right angles to this general trend.

The dip of the coal beds is radial, ranging from SW through E to ENE in the southern section and from NE to N to NW in the northern section. The maximum rate of dip is 1 in 12, with the normal variation from 1 in 15 to 1 in 25. The two seams to be recovered, the Queen and Little Wonder, will be worked from the outcrop to a depth of approximately 100 feet.

The succession of strata in descending order is:

- 5 to 62 ft—glacial drift
- 2 to 43 ft—sandstone
- 48 in.—Queen seam
- 10 to 28 ft—sandy mudstones & shales
- 27 in.—Little Wonder seam

The Queen seam is prone to washouts of argillaceous sandstone. One of these washouts in the northern section was about 300 feet wide. The Queen seam has been worked from local drifts and a nearby colliery.

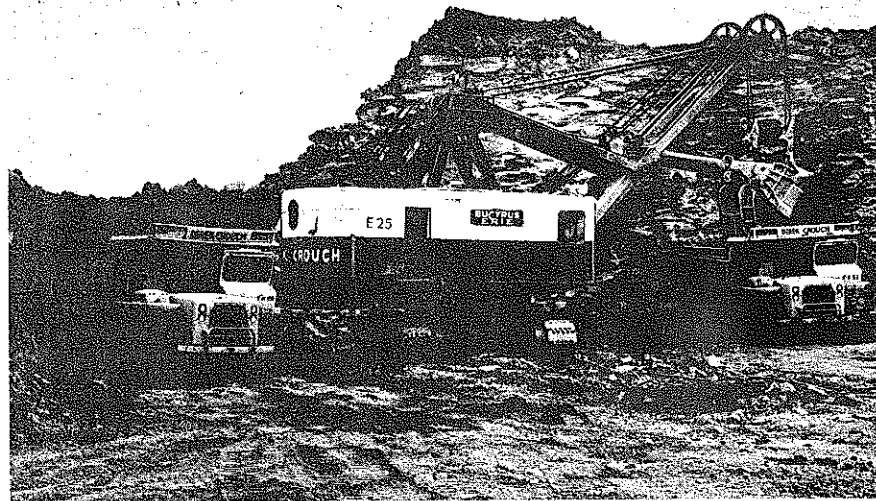
Radar North geology

The geological structure of this area is dominated by a series of three NE-SW trending normal faults which, downthrowing inwards, form a stepped trough where the vertical displacement varies from 20 to 70 feet. This has generated dips in all directions but the general trend is southeasterly at a rate of 1 in 15.

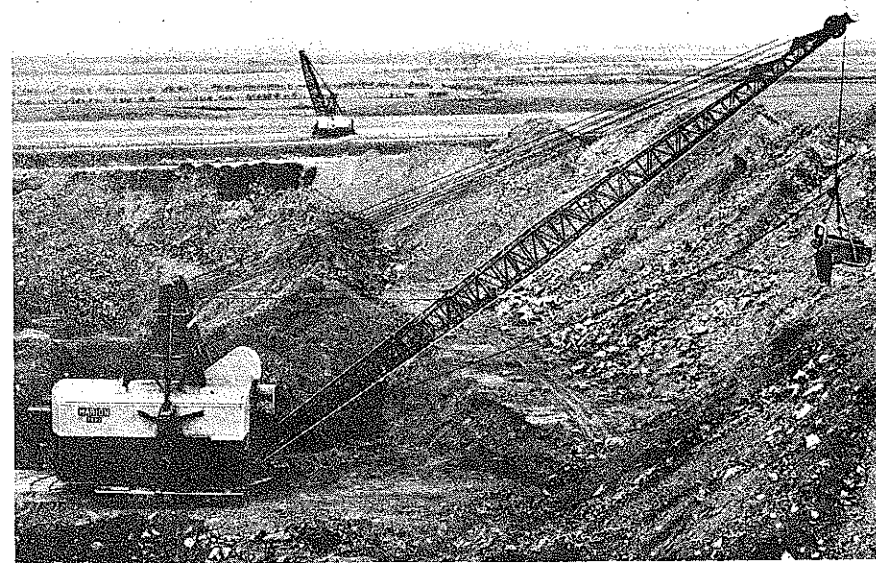
The interval rocks between the coal seams are conventional Coal Measure shales, mudstones and sandstones. Although subject to faulting, these interval rocks are not unduly fragmented or weathered.

The succession of strata in descending order is:

- 5 to 90 ft—glacial drift
- 0 to 30 ft—shales
- 27 in.—Little Wonder seam
- 11 to 41 ft—shales and sandstone



Above: A 40-ft lift of shale in the Radar North working area is excavated by a Bucyrus-Erie 150-B, 6-yd shovel and loaded into Caterpillar 767B, 35-ton rear dump trucks for disposal
Below: A Marion 7800 dragline with 240-ft boom and 30-yd bucket—one of two used on the project since 1957—casts spoil in the Radar North working area



32 in.—Top seam
30 to 80 ft—shales and sandstone
56 in.—Main seam
34 to 51 ft—shales, mudstones and sandstone
25 in.—Bottom seam
2 to 25 ft—shales, sandstone and fire-clay
15 in.—Cheeveley seam

The indicated thickness of the coal seams gives no idea of the variation in thickness nor the behavior or incidence of bands. For example, the Main seam varies from 33 to 82 in. in thickness, and the Bottom seam may have as many as three bands, one of which varies from 4 to 37 in. in thickness. In addition there are several intercalations (insertions) of carbonaceous shale in places, also of cannel coal. Total thickness of coal is 13 feet.

Contemporary erosion or washout has seriously affected the Main and Bottom seams south of the site perim-

eter, and the Cheeveley seam within the working area.

Glacial drift or boulder clay covers the entire area. It varies in thickness from a few feet to 90 feet. The thickness increases from the minimum in the extreme southern section to the maximum along the northern perimeter. In the preglacial buried valley just north of the northern perimeter the glacial drift is 130 feet deep.

Operating methods

In the Radar North area a "box cut" roughly 100 ft wide, 200 ft deep and ½ mile long, totaling some 11 million cu yd of material, was made initially in the southeast end of the working area. The coal was recovered and the excavated overburden material transported to a spoil heap placed near what will be the final cut. This permitted material removed in subse-

quent excavations to be cast into the voids developed for extraction of the coal.

The remainder of the area excavation was programmed in a series of cuts 100 feet wide, with the excavation sequence and units involved shown in Fig. 2.

The initial mining operation is the stripping and stockpiling or immediate replacement of topsoil on spoil banks as the final step in restoration of the area. This is done by Caterpillar 657 wheel tractor scrapers rated at 32 cu yd struck, 44 cu yd heaped.

One of the major excavation problems has been the removal of the glacial drift. It could not be cast into the bottom of available voids because its unstable character would cause the spoil bank to slide.

When its thickness exceeded 40 feet it could not be handled in a single lift by a shovel loading trucks for transportation to spoil heaps or to final disposal on spoil bank areas. To split it into two lifts would mean having the trucks travel on a clay bed, an almost impossible task.

It was decided to use a bucket wheel excavator to remove the glacial drift and feed it to a system of movable conveyors for disposal. This operating procedure was initiated in November 1961 and has since proved to be both practical and economical. The amount of material handled averages 2 million cu yd annually.

The bucket wheel excavator, designed and manufactured by Fried Krupp, Maschinen-und Stahlbau, Rheinhausen, Germany, has an 18-ft wheel equipped with eight ⅓-yd buckets. It digs a face up to 40 feet high and discharges the material to a 1768-ft face conveyor. The material is then elevated to ground level by a 158-ft inclined bridge which feeds to a 1212-ft frontal transverse conveyor.

This, in turn, discharges to a 1676 ft dump conveyor from which the material is accepted by a spreader and spread on top of the dragline and shovel spoil banks. All of the 40-in. conveyors used in the system are readily moved by a tractor with side boom attachment for positioning in phase with the glacial drift excavation.

This method of handling the glacial drift has many advantages from the viewpoint of restoration. It provides a progressive and immediate restoration of the area. Also, the overburden material is replaced in roughly the same

order it had originally, or the shales will be covered by a 40-ft layer of drift material on which the topsoil can be spread as a final step.

After the glacial drift has been removed, the next 40 feet of boulder clay and shale is excavated by a Bucyrus-Erie 150-B, 6-yd shovel which loads Caterpillar 769B, 35-ton rear dump trucks. The material is used to both raise and level the dragline spoil banks.

The remaining overburden, amounting to about 60 percent of the total excavation, contains about 82 percent of the coal. The hard shales and sandstone which comprise the interval rocks are drilled by Joy Sullivan 56-BH and 58-BH drills, or by Haus Herr (West Germany) H.B.M. drills, and broken up by ammonium nitrate/fuel oil explosive.

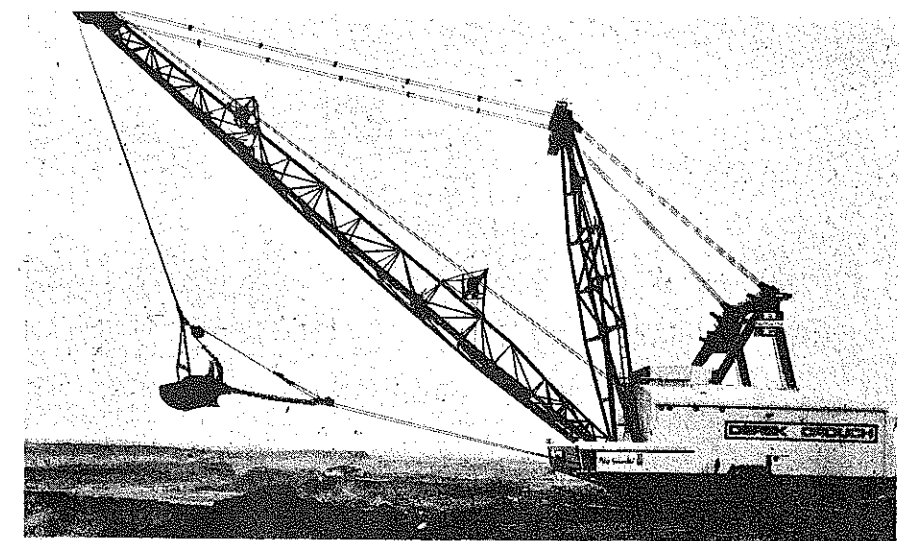
Initially this material was excavated by two Marion 7800 walking draglines equipped with 240-ft booms and 30-yd buckets and cast into the mining voids. These are the units listed as "Marion Dig" for the four bottom lifts in Fig. 2.

In August 1969 one of the Marion 7800 units was replaced by a Bucyrus-Erie 1550-W walking dragline equipped with a 265-ft boom and a 65-yd bucket. Claimed to be the largest in Europe, "Big Geordie" can dig 150 feet below its shoe level, dump at 130 feet above this level, and cast spoil 233 feet. It will be used in the deeper excavations.

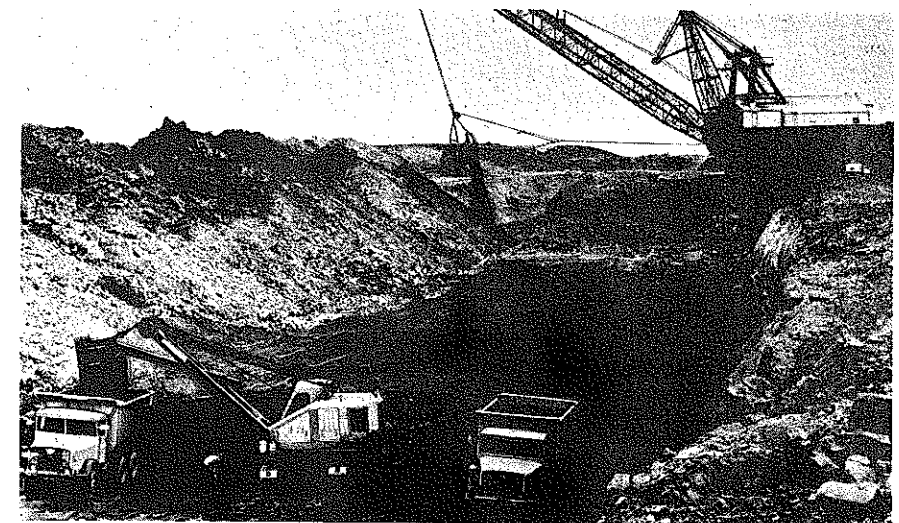
In the Coldrife area the Queen and Little Wonder seams are excavated by two Bucyrus-Erie 1150-B draglines equipped with 180-ft booms and 27-yd buckets. The excavating sequence with 80-ft wide cuts is shown in Fig. 2. Subsoil is stripped off to a depth of 3 feet in advance of the dragline work and stacked on the perimeter of the site or spread on restored areas if they are available.

As the coal seams are exposed, small diesel shovels load trucks with rear dump 23½-yd aluminum bodies, provided by A.E.C. Southall, Middlesex, England. These transport the coal to the screening and blending plant located southwest of the Radar North working area, and subsequently to the rail shipping point.

Most of the excavating equipment is operated by 50-cycle alternating current power, the standard in England. The bucket wheel, 150-B shovel and two 1150-B draglines are supplied with 3300-v power. In the case of the



Above: In August 1969 this Bucyrus-Erie 1150-W dragline, "Big Geordie," replaced one of the Marion 7800 drags on the Radar North working area. Claimed to be the largest drag in Europe, the \$5.5-million machine has a 265-ft boom, can dig 150 ft below its shoe level, then lift 100 tons of material in its 65-yd bucket and cast it 233 ft to a maximum height of 130 ft. Two operator cabs provide for the best operational view on either side according to the direction of the digging operation. Below: One of the two Bucyrus-Erie 1150-B draglines equipped with 180-ft boom and 27-yd bucket casts spoil into a mining void at the Coldrife operation. A small diesel shovel loads coal from the exposed seam into trucks with 23½-yd aluminum bodies for transport to the screening and blending plant



1150-B units this is converted by a booster to 4160-v, 60-cycle power. The two 7800 draglines use 6600-v power. The incoming power to the 1550-W dragline is 11,000 v.

Landscape renewal

The National Coal Board expects opencast coal operators to leave the land in better shape than before work was started. This involves correction of dereliction from past coal mining, removal of pit heaps and incongruous structures and, where possible, assistance in the correction of obsolete highway patterns that may traverse the working area.

The contractors on the Radar North project are discharging their responsibility under this policy in a progressive and orderly manner. As illustrated in Fig. 3, restoration follows mining immediately. The scars and

mounds of old deep-mining are blended into the new landscape. The rambling A1068 road has been given a new alignment as part of a 16-mile pioneer Parkway between Morpeth and Warkworth just north of Amble.

That Parkway, connecting at Morpeth with the Great North Road between London and Edinburgh, will open up the beautiful and still unspoiled coast of Druridge Bay to district residents as well as those from more remote points.

Also included in the landscape renewal plan is the development of a 200-acre site on the Coldrife area into England's first Seaside Country Park. Included in the park development will be a lake, view points, picnic areas, a hardstanding or plane parking area and a slipway for boats.

END

*Reprinted through the courtesy of Coal Mining & Processing, 300 W. Adams St., Chicago, Ill. 60606. First publication of this article by Dr. Singhal was in CM&P's July, 1970 issue.

Backfilling Abandoned Coal Mines

A CONTRACT for backfilling abandoned coal mines under a square block area of Rock Springs, Wyo., has been awarded to Dowell Division of The Dow Chemical Co. Awarding of the contract by the City of Rock Springs followed feasibility studies including a demonstration with model equipment and sonar exploration, and financial commitments to carry out the project in an effort to prevent subsidence.

Backfilling of the water-filled mines in the single block area, which will require some 20,000 cubic yards of material, is expected to begin between Oct. 15 and Oct. 20. Amount of the contract is \$173,140.

Known officially as the Rock Springs, Wyo. Mine Backfilling Demonstration Project, it represents a culmination of months of study and preparation and is a joint effort of private industry and governments. Participants include the Department of Housing and Urban Development, the U.S. Bureau of Mines, the State of Wyoming, the Union Pacific Railroad and Dowell Division of Dow. Total funds committed to the project amount to \$472,500. Some state funds are being held for future use in other backfilling operations in the city.

Subsidence problems have been experienced from time to time in Rock Springs in the past. However, concern over the abandoned mines, operated in the early 1900's, began in earnest in early 1969 when the ground above some of the mine shafts that form a catacomb under much of the city began to subside. A number of homes, businesses and streets suffered damage.

Threatened are some 635 homes and 800 business establishments in a 200-acre area of the city valued at more than \$17 million. Cost of backfilling the entire 200-acre critical area has been estimated at \$3 million.

The backfilling technique proposed by Dowell is the first of its kind and its success could have nationwide significance as well as providing an answer to subsidence problems at Rock Springs. Many cities in the United States are built over abandoned mines.

In the demonstration project at Rock Springs, sand from a nearby

source will be injected into the mine shaft in a slurry form by Dowell equipment. The blending and pumping units are designed for high speed injection of slurries into oil and gas wells. Dowell will utilize water from the mines for the slurry.

Dowell engineers estimate the backfilling in the square block area to be completed within five days from the time pumping is begun. This is based on an injection rate of from 150 to 300 barrels of water per minute and three pounds of sand per gallon. The Dowell technique is the subject of a

patent disclosure upon which an application will soon be filed by Dow.

Rock Springs Mayor Paul J. Wataha said the purpose of the current demonstration is threefold: to establish economic feasibility of hydraulic backfilling of flooded mines through a concept that injects slurried solids at high velocities through a single bore hole; to establish economic and feasible methods of mapping flooded mines; and to prepare and make available for distribution a comprehensive report on the findings for application to other areas of the nation with similar mine conditions.

Fuel Shortage Crisis

THERE is an energy crisis facing this nation because of the shortage of fuels. There are five energy fuels—water power, oil, gas, coal and nuclear power, and only coal has the known reserves to supply the expanding energy requirements of this country in the years immediately ahead.

"In order for the coal industry to meet this challenge, the industry must attract thousands of energetic and knowledgeable young men into the mining industry," said James R. McCartney, director of Community Relations and Civic Affairs for Consolidation Coal Co., at a recent dinner honoring the 24 college students who were summertime employees of Pocahontas Division-North.

Mr. McCartney said that Consol's 12 operating divisions with mines in seven states employed over 300 college students this summer from 70 different colleges and universities. Sixty per cent of these college men are studying mining engineering or other engineering courses.

He said that Consolidation Coal Co., the largest coal company in our country, has over 15,000 employees, over 50 operating mines and 10 new mines under development. By 1975, with these new mines in full production, Consol hopes to produce over 80 million tons of coal annually. This would be a 33½ per cent increase in produc-

tion over the company's 60 million tons produced this past year.

He stated that Consol urges young men to enroll in post high school mining engineering training, either through vocational schools or by obtaining a four-year college degree in mining. He emphasized that Consol offers summertime employment to any young man studying mining engineering in college. He also said that an excellent way for a young man to obtain a mining engineering degree is through the co-op program, whereby the student alternates by semester attending college and working in the mine, thus obtaining practical experience and also earning sufficient money to pay for his college education.

Mr. McCartney said there are hundreds of mining engineering jobs available every year in the coal industry and he predicted that coal production will increase from the present 550 million tons per year to 750 million tons by 1980 and a billion tons a year by the end of the century.

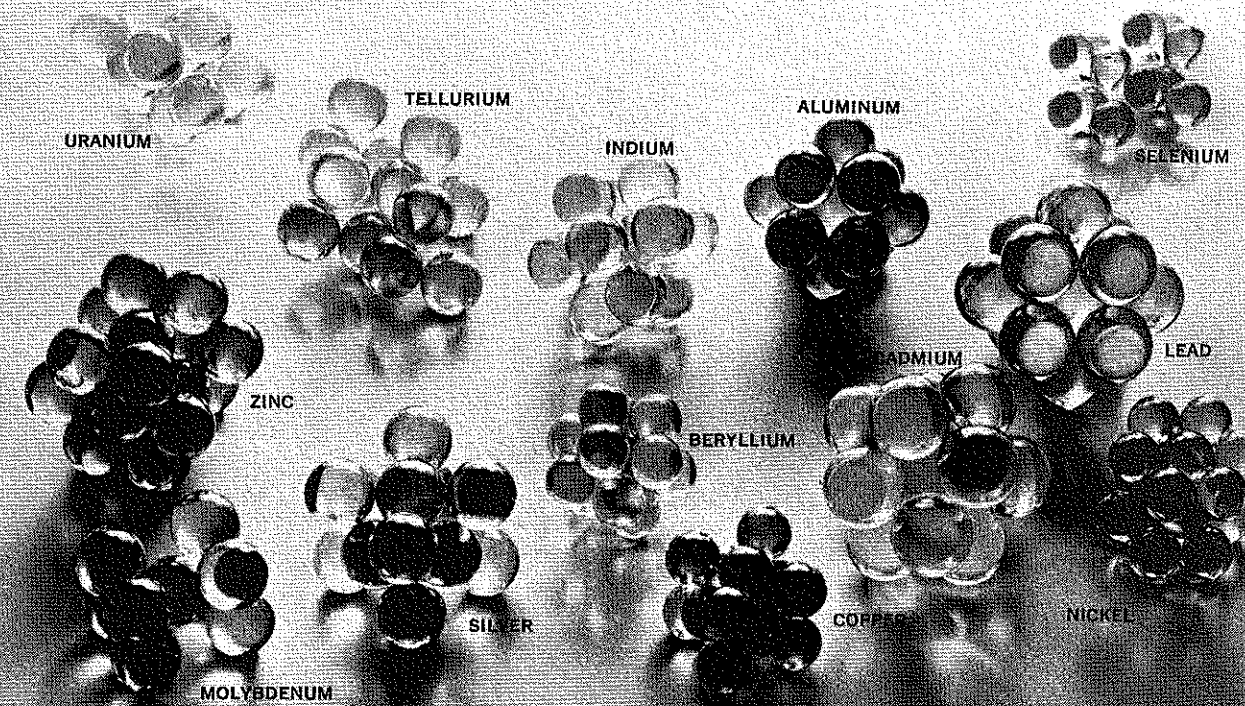
He reviewed some of the challenges facing the coal industry and urged these young college men to obtain their college education and then apply their youth and knowledge in helping the coal industry provide the ever increasing energy fuel requirements facing this nation.

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A Water Diversion Tunnel Driven in Coal*

By Arthur E. Falvey

AT LAKE DeSMET, about 15 miles north of Buffalo, Wyo., an unusual project is in progress. Included in this project are diversion works on Piney Creek, a water diversion tunnel, and construction of a new dam at the north end of Lake DeSmet. This project was started during the latter part of 1969 by Reynolds Mining Corp.

The tunnel under construction runs through a seam of coal 175 feet thick and is ranked as sub-bituminous "C." Two 16' shafts have been sunk by boring machine—one 165' deep and the other 100'. These shafts are being connected by an 8½ foot tunnel 8,390 feet long, also using a boring machine.

At the present time the tunnel is in over 3,100 feet. 24" air shafts have been driven at 300 feet intervals along the tunnel center line to comply with the mining laws of Wyoming. (According to Wyoming Coal Mining law, fresh air cross-cuts must be driven

every 300 feet.) These are lined with a steel tube, and a "torpedo" affixed to a portable hoist can be used as an emergency escape-way in the event men become trapped in the tunnel. The shafts are also used to carry power lines and pipe in the advancing heading. An exhaust fan on the surface is moved ahead as the tunnel advances every 300 feet. An elevator is installed in the 165' shaft for the convenience of the men. A crane is provided for material.

The elevator can be operated from either the surface or the tunnel, and is provided with safety switches on the doors as well as at both top and bottom to prevent over-wind. The cage is also equipped with safety dogs and an emergency stop-button on the switch. A telephone is connected from the surface to the bottom of the shaft and to the face of the tunnel.

Alignment of the tunnel is maintained by use of a laser beam with a double target on the mining machine to maintain both line and grade.

The coal has a tendency to slake so is coated with a thin layer of

gunite. At places clay seams and shale seams are encountered. At such places slabby ground is encountered and is supported with steel ring-sets and timber lagging. Small quantities of water have been encountered in the tunnel but pose only minor problems to the guniting so far.

The shafts are lined with one foot of concrete and were poured monolithically.

Concrete is prepared at a centrally located batch plant with all mixes carefully controlled. The concrete is moved to the various locations by transit-mix trucks. At the shafts the concrete is lowered on one-yard dump buckets and poured to the level of the slip form. This form is raised at the rate of one inch every two minutes by a series of hydraulic jacks, all controlled from a central panel on the surface.

Removal of the material from the mining machine is unique. A conveyor moves the material to a hammermill, where it is mixed with water and fed into a pump. This pump moves it to two pumps placed in series at the bottom of the shaft. Two settling ponds in series are fed by these pumps. Overflow from the second pond enters a pond which is the feed supply for cycling water underground. A well provides make-up water to this pond.

The outlet area for the water at Lake DeSmet calls for the construction of a 40 foot high dam to be located north of the present dam. When this project is completed, the level of the lake will be raised 10 feet.

*This article is published posthumously. Mr. Falvey died July 29, 1970. (See MINES Magazine, p. 40, Sept. 1970.) He had received his E.M. degree in 1934 from the Colorado School of Mines.

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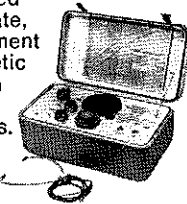
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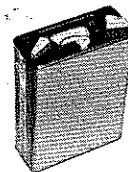
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Coal Industry Threatened By Oil Import Policy

IN the face of an accelerating trend toward increased imports of residual fuel oil, the Government must take steps to assure that alternate domestic supplies of fuel are available to keep electric power plants and other industrial plants on the East Coast operating in the event of an emergency cutting off-shore oil supplies, a House Subcommittee studying the Nation's oil import program was told by a spokesman for coal producing and transporting industries.

W. W. McClanahan, Jr., executive vice president of the National Coal Policy Conference, told the House Interior Committee's Subcommittee on Mines and Mining that more than 85 percent of all of the residual fuel oil consumed on the East Coast is imported—close to 450 million barrels in 1969—and that strong efforts are now being made to open the interior of the Nation to imports via the Mississippi River.

One result of the availability of unlimited amounts of imported residual has been that more and more power generating plants have converted their fuel burning facilities to use only oil. The question of how these plants could be kept operating in the event the foreign oil supplies are cut off because of developments outside the control of this Nation is one that raises serious national security implications and demands the immediate attention of top Government officials responsible for developing policies related to fuels and energy, he declared.

As a first step, Mr. McClanahan urged that the recently created Oil Policy Committee, headed by Office of Emergency Preparedness Director George E. Lincoln, conduct a study to determine just how serious is the problem created by the lack of alter-

nate fuel burning facilities in power plants and other essential industries, and to take steps to preserve the dual fuel burning capabilities of essential industries.

The second step, he said, should be a revision of present policies which permit unlimited residual imports in favor of a quota system, based upon present record import levels, which recognizes that imported oil must be permitted to share in, but not dominate, the growth in the East Coast market for heavy industrial fuel.

Mr. McClanahan said the increase in residual imports had destroyed "any incentive" for developing domestic fuel supplies to serve the East Coast market.

"We recognize that an immediate roll-back of present import levels would be both impracticable and impossible," he said. "We do, however, urge that the government adopt a new policy looking toward encouragement of the development of domestic fuels to supply East Coast market. In this way, the serious national security problem this situation has created could be gradually overcome."

The increased demand for low sulfur fuel to meet air pollution control requirements has added to the pressure for increased residual imports, Mr. McClanahan told the committee. The drive to open the Midwest to imported residual oil for the first time is, in many respects, a reflection of the Nation's air pollution control program, he added.

Yet, by encouraging utilities and other fuel consumers to rely on imported fuel to meet air pollution requirement, the government is discouraging and delaying the "most logical and best long-term solution," which Mr. McClanahan said, is the development of air pollution control technology to permit the continued and expanded use of coal.

For the rest of this century, at least, the Nation cannot meet its demand for electric power without the use of significantly larger amounts of coal than the more than 300 million tons burned at present time to generate power, he said.

But increasing imports of residual oil are destroying the capabilities of the coal industry to develop new producing and transportation capacity that will be required in the future, he said.

For this reason, Mr. McClanahan said, a revision in current residual oil import policies is imperative.

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Coal— Salvation for the Power Crunch

SOME five years ago the concept of Total Energy was advanced and several of the major petroleum companies moved into the fields of coal mining and uranium production. The move was timely but did not anticipate the crisis that was to develop with the middle east Imbraglio.

With the explosion in the Middle East, petroleum resources, that had been fueling European, and to a lesser extent, U.S. Industries were insufficient to meet the increased re-

quirements in the late 60's. Natural gas, which had been flared in those producing areas where there was not a market, suddenly became of interest and the concept of moving liquefied Natural Gas to a market became of interest.

In July 27, 1970 issue of the *Oil and Gas Journal* an in-depth story noted that several Cleveland factories had been forced to shut down last winter (1969-1970) because of the lack of natural gas to fire the plant's furnaces. The article stated: "That little-noticed event may have been a harbinger of the immediate future. The nagging question is whether there will be more Clevelands this winter. Or, more probably, 'How many Clevelands will there be?'"

"The present situation is now being widely recognized by Government and Industry as an approaching crisis. Government and industry sources freely predict spot shortages of fuels - all kinds of fuels - this winter." The article said that except in rare instances, no homes will go cold this winter, but that the lack of adequate supplies will result in higher prices for fuel bought in a spot market.

"What is happening," the article stated, "is a confluence of several trends, all putting pressure on fossil-fuels supply, creating either unpleasant surprises or at least greater problems than were anticipated. Energy demand is surging along at five to six percent per year—with demand for power going from 7.5 to 9 or 10 percent annually.

"At the same time, the utility industry's abandonment of coal to rush

to embrace nuclear energy—the great fad of the early 1960's—has proved to be quite premature. Nuclear plants ran into construction, safety, pollution and siting delays of up to three years. And plants didn't always perform up to standard when completed.

"Relaxation of controls on imports of residual fuel spelled the end for coal in new plants on the East Coast in the same period. Coal men got the message. They didn't open the coal mines they would have otherwise. And when utilities came running back, the coal capacity simply wasn't there. Hence, the two years' experience of using and exporting more coal than was produced.

"Into this picture came clean-air regulations, limiting emissions of sulfur dioxides, in effect, outlawing coal and oil with more than one percent sulfur. New rules, including Federal, state and local, may impose limits ranging in local instances to as low as 0.3 percent sulfur this fall.

"Considerable volumes of low-sulfur residual have become available, especially from African sources. But not enough. And, coincidentally, the years of drilling declines due to low gas prices have resulted in reserves declines in 1968 and 1969, just when demand for this low-sulfur fuel spurted as industries and utilities sought to meet clean-air rules and resid supplies, with U.S. customers having to bid against foreign customers more than usual. Then this spring a crimp was put in the supply of both these fuels. New coal mine safety regulations resulted in closing a large number of mines, especially small ones which were said to be uneconomic under the new law."

The article also noted that the closing of the Trans-Arabian Pipeline and curtailment by Libya of production has resulted in a tightening of the world's crude supply. The result of all of these situations, plus others, has created the energy crisis which the magazine says will hamper the Nation this winter.

In February 1966 the National Coal Policy Conference Inc., published *POWER FOR PEOPLE*, a study of coal plants going on line or announced for construction from 1965 forward. These 75 new coal plants had a total capacity of 42,000 megawatts, and would require 105 million tons of coal per year. Between March, 1966, and September, 1967, 41 new plants with

30,266 megawatts of capacity and requiring 76 million tons of coal annually have been announced.

When all these new plants are in operation in about 1971 or 1972, even allowing for the shutdown or phasing out of some of the older plants now operating, total coal required for electric generation in the U.S. is expected to be well over 400 million tons per year.

The Federal Power Commission's National Power Survey of 1964 predicted that total demand for electric power would more than triple between 1960 and 1980. It predicted that coal's share of generating capacity would require some 500 million tons annually by 1980.

Current growth in coal-fired plants now suggests that even that figure was conservative, as 570 million tons of coal, which is probably 10 million tons less than actual demand, will be produced during 1970.

Again turning to 1967, the Petroleum Press Service in discussing the possibility of replacing unstable Middle East Oil, cites coal, natural gas, and nuclear power as possible substitutes and says that by 1975 this displacement of imported oil could approach the equivalent of six million barrels daily. This assumes that imports of U.S. steam coal and nuclear power generation might each rise tenfold, natural gas consumption six fold and substantial deliveries be made of Liquefied Natural Gas and Russian gas. This could happen if oil became too dear or if continuing instability in overseas sources of supply made the nations look to their own backyards.

Continuing Middle East crises will make other hydrocarbon sources — extra heavy oils such as that produced in Venezuela, sales and tar sands - more attractive to Europeans. And the liquefaction of coal is stirring more interest, the magazine reports. It added:

"Beyond this again is coal. Some U.S. oil companies, wishing to broaden their hydrocarbon base, have already taken an interest in the coal industry, either in its prospects as such or in its use for making synthetic oil. The current cost of gasoline produced by Consolidation Coal's solvent-extraction processes at a commercial plant is 10½-13 cents a gallon; reckoning 11 cents a gallon for a large-scale operation, based on the low-cost coalfields of southern Illinois, this would be competitive with gasoline priced at 12-14 cents a gallon ex-refinery in the Chicago area."

Oil and Gas Journal pointed out in a recent editorial that it's now apparent to nearly everyone that the Nation's fast-moving drive against air pollution temporarily is putting an unbearable pressure on the domestic energy supply, and that the Eastern Seaboard industrial complex has become 93.7 percent dependent in im-

NEW MINES CHIEF

Work Cut Out For Graduates*

GUY T. McBRIDE, JR., 50, who on Sept. 1 became the Colorado School of Mines' 12th president, predicts the school's graduates will be among those who solve environmental problems instead of just talking about them.

"Many people are discussing environmental dangers but engineers like the ones trained at Mines, are the only ones who'll be able to do something about them," McBride said. "That's what I intend to tell the freshmen when they get here Sept. 14."

McBride, who succeeded Orlo E. Childs as Mines president, suggested however, that exposure of Mines' students to ecology and methods of environmental control should come through several courses not through an environmental major.

Childs resigned to become vice president for research at Texas Technological University.

Other Goals

The new president, who has been a vice president and general manager of the phosphate division of the Texas Gulf Sulphur Co., also will work toward expansion of Mines' international role and reputation as a mining school.

"Mines is recognized in industry as the eminent mining school, particularly on the undergraduate levels,"

ported residual fuel. The editorial continued:

"If the Nixon Administration can solve the riddle of these twin developments, it will have taken a giant step toward easing the current energy crisis and avoiding another soon.

"It has been this switch by utilities away from coal that has put unusual strain on gas and residual supplies. Gas supplies are critically short. A similar situation exists for residual because of the tanker shortage. Domestic refiners, who practically have quit making residual because of its low price, probably can crank out enough fuel to meet this emergency. But it will be very expensive. The switch will require processing alterations, change in yields, unnecessary production of other products, shuffling of logistics, increased domestic crude production and greater crude imports from Canada."

he said. "Institutions like Columbia University have fine graduate programs in mining, but they produce persons with doctoral degrees, not mining engineers."

And, even with employment problems facing most recent college graduates, there continues to be a demand for Mines' graduates, with most receiving several job offers, McBride said.

He will answer suggestions that the mining school's enrollment be expanded by placing more emphasis on recruitment.

Methods Suggested

Additional students can be recruited, he said, by informing high school counselors about Mines' programs and by asking the school's alumni to assist.

Admitting that his recruiting suggestions are "just ideas," McBride said he won't propose any major changes at Mines until "I have a better feeling for the school."

A former dean of students at Rice University, Houston, Tex., McBride began getting acquainted Tuesday by meeting with Mines' vice presidents.

He also plans to meet with students and said he hopes they will be frequent visitors to his home near the campus.

'Always Welcome'

"Students will be welcome any time the light is on" McBride said. "And, the light will be on any time I'm home.

"I want to talk with students. I want to know how they feel about things like ecology and political problems. They also need to understand what's going on here."

Explaining that he doesn't anticipate any student unrest, just student discussions, McBride said, "I didn't come here because I thought I'd be among college presidents hanged."

McBride said he had always wanted to be a college president. And after testing the president's chair for a few hours Sept. 1, he said it felt "great."

McBride received his doctorate from Massachusetts Institute of Technology. He will, in addition to his presidential duties, teach a few Mines courses.

*Reprinted courtesy of The Denver Post (Sept. 2, 1970 issue).

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Harry C. Bullock—'45

Goodbye, lake.



PHOTO: JOHN HARRISON

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Early Days in the San Juan

(Editor's Note: This interesting account of the early days in the San Juan-Silverton-Eureka District was written by John M. Stewart to his friend, Guy L. V. Emerson, Hon. 1965, president of the Denver Mining Club and owner of the Treasure Mountain Gold Mining Co.)

I HAVE been digging up some old records of the good old days when I lived in the San Juan. Wonderful days! Days of hope, disappointment, hardship and more hope. But after all, it was a grand life. Good health, some success and strong faith, is all we need anyhow, and if we could only get rid of our selfishness, we would be far happier in the possession of these blessings than to break down our health by 20th century scheming and worry to own the earth.

"I was in Durango and Silverton last September and you cannot imagine what a treat it was to me to again view the old sights which were so familiar to me 45 years ago (1891). Somehow I seemed to feel that the very rocks and trees along the old trails in the La Platas and on to Ophir and Red Mountain and around Silverton as I passed by said "Howdy, old boy, we remember you when you visited us afoot and horseback nearly one-half century ago. Glad to see you again." And was I glad to see them—you bet I was—and regretted to have to leave so soon, but the first equinoctial storm of the season brought our visit to an abrupt end. I would have loved to have visited Eureka and the Forks, and would have done so had I known of your plans to develop old Scotia and Golden Fleece.

"It was in May 1895 that I was asked by the president of the Golden Fleece Mining Company, to take charge of the property and try to straighten out the troubles they were having with the Scotia, and a heavy stockholder in the Golden Fleece, who at that time was working the property without a crew. (Learning that this stockholder had purchased a very valuable farm on the Missouri river somewhere above Kansas City, and suspecting that he had paid for this farm with cash received from the sale of gold taken from the Golden Fleece,) the Company gave me authority to go to Colorado and take full possession of the mine.

"I shall never forget the night I rode into Eureka. It was late in the evening, but still light enough for me to locate Hansen's cabin. After introducing myself and accepting a cup of good coffee and learning from him the direction of the Golden Fleece and assuring him that I knew something of snow-covered mountains, I left him still mumbling about the "damned tenderfeet sending a young man out

at midnight to take charge of a mine situated somewhere on top of a snow-covered mountain he had never seen" etc. Tying the rein of my horse over the horn of the saddle, I turned his head towards Silverton and away he galloped back to his home leaving me alone to find the Golden Fleece in the dark. The mountains were still heavy with snow, and it was very cold. The story is a long one, so will not recall the long struggle of that night's trudge up the mountain to the Fleece,

"I do not remember what hour I reached the mine. I was so nearly frozen and exhausted that I would not have known the time had I seen a clock, but do recall that it was still dark, and that I received a cold reception when I pounded on the door. But to shorten my story, I was all alone and in complete possession of the property the next day and upon going down in the mine I saw much evidence of "high-grading" and upon removing some plank in the bottom of the drift which had apparently been placed there and covered over hurriedly, I found a hole about 4 or 5 feet deep which gave much evidence of having contained very rich ore. Some of it was still in place. It was from this small shaft I extracted the specimen I have which, when taken out, weighed nearly two pounds. I gave much of it to members of the Company and had one piece cut and polished, half of which I gave to Mr. Landa.

"The mine was in a bad condition—gouged and gophered everywhere. I put on two or three men and began getting it in condition to mine and was very busy for some weeks timbering and sampling. They had a very complete laboratory and assay equipment, and I assayed all material found in place as well as waste with which the workings, except the main drift, were filled. There seemed to be a very small dump to the right of the cabin. Nothing I saw indicated that any real mining had been done—gouged everywhere, but no extensive work.

"Believing that much high grade ore—probably 50% metal in places—had been taken from the mine and concluding from the evidence found in the assay room, that the rich ore had been smelted there, I searched everywhere for large crucibles and finally found them concealed in some bushes way down in the bottom of the gulch. The pulp in some of the crucibles had "frozen" in smelting and large globules of pure gold still clung to the sides of them. I made quite a handsome clean-up by chipping out the metal and remelting the "frozen"

pulp.

"Having cleaned up the workings, timbered where necessary, made out a list of equipment needed to work the property and getting my crew together to begin operation, I received a telegram which read:

'MORRIS LAND SHOT AND KILLED BY HIS BOOKKEEPER. CLOSE DOWN THE MINE AND COME TO KANSAS CITY.'

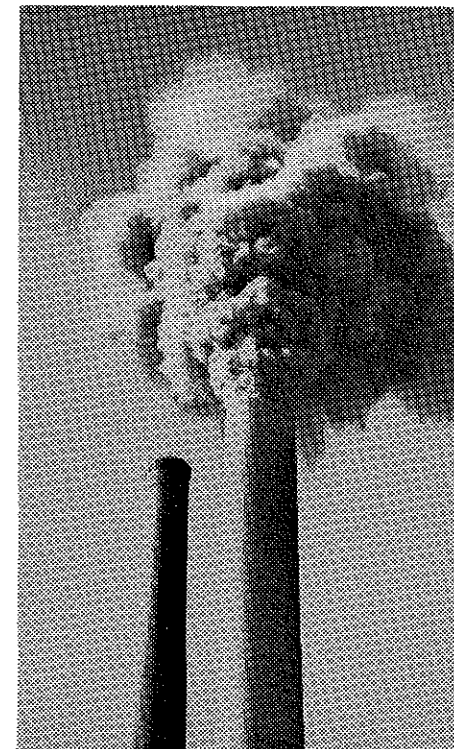
"Acting on this wire, I paid off the men and my bill at the Eureka store and hurried back to Kansas City where I remained for some time pending the action of the Court in appointing an administrator, and in awaiting their decision regarding the further development of the property. However, becoming tired of waiting for them to decide what they would do, I finally severed my connection with the Company and have not seen the Golden Fleece since.

"Some of the names you mention I still recall—others only vaguely. I recall the Stoibers who owned the bank in Silverton and the Silver Lake and the Iowa-Tiger. When in Silverton last September as I walked the street of that old town, many faces, names and incidents of the old days came before my view. It seemed to me that I reenacted the incident that occurred to me one morning when I stood in the doorway of the old Grand Hotel awaiting the "first call" for breakfast. While watching the clear stream of water flowing in the gutter, which was always an attraction to me, my attention became centered on something shining on the board sidewalk. Walking over and picking it up, I found it to be a piece of jewelry with a very high grade diamond set in it, probably worth \$30 or \$40. I never learned who lost it.

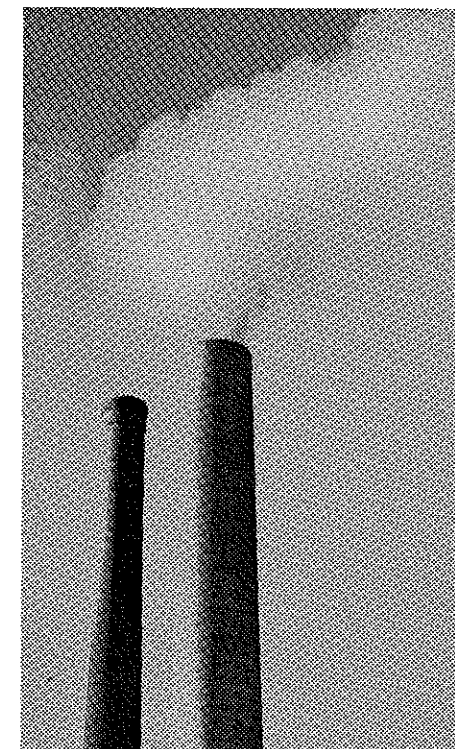
"Also, when we drove to Ouray, I thought I heard horse-hoofs behind our car. This was a revival of an incident that occurred to me early one morning while on my way to a claim I was working on Yellow Mountain. Hearing a horse behind me coming at a rapid gait and being hailed by the rider, I pulled up. The man apologized for stopping me by saying that he thought I might enjoy his company as he felt sure he would enjoy mine, so we rode together to the Burro Bridge where we parted, I taking the Ophir trail while he continued on to his property, the Camp Bird, of which he was the owner. I always admired Tom Walch. I never met him again.

"Thank you for your good letter, and I wish you great success, which I believe will be yours if you ever cut the Scotia, Golden Fleece and adjacent veins in that wonderful mineralized territory."

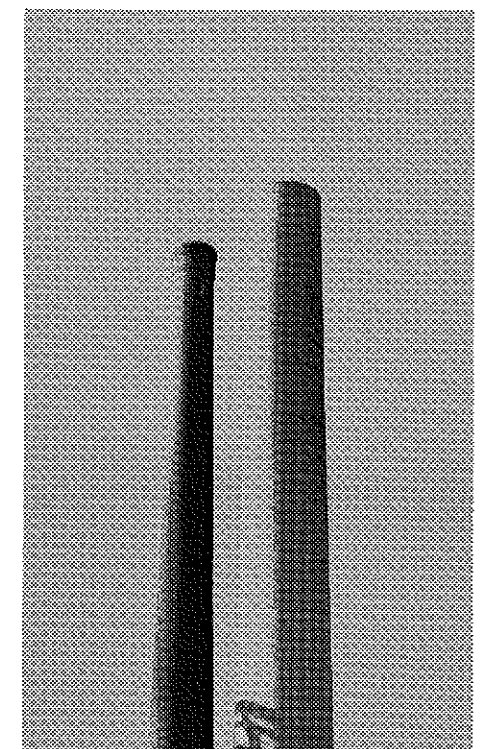
air solutions



**BEFORE
ELECTROSTATIC
PRECIPITATORS**



**AFTER
ELECTROSTATIC
PRECIPITATORS**



**OUR GOAL:
ZERO EMISSION
OF VISIBLE MATTER**

You see, we have done something about air quality control (pollution). Not enough, as it turns out, but nearly all that present technology will allow. The photos above were taken at our Valmont Generating Plant in Boulder, Colorado, during a comparative test of one type of electrostatic precipitator. As you can see, it helped a lot. But none of our precipitators — we have installed 10 in all — have performed to our expectations, or to manufacturer's specifications.

There are a number of technical reasons for this, among which is the low sulphur content in the coal we burn. It has some peculiar characteristics that make it extremely difficult to trap all the pollutant particles.

So our scientists and engineers are working in conjunction with other investor-owned utilities across the nation and with certain manufacturers, to develop devices that will remove all of the particulate air pollutants from our stack exhaust. Our goal is not solely to be within legal standards of visible emission. We have achieved that before, but the standards keep getting stricter.

Our goal is zero emission of pollutant particles from our stacks.

Our scientists tell us we are very close to a solution. Not close enough to brag yet, but close enough to say that zero particulate emission can be accomplished, and will be in the reasonably near future.



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Baja Trip in Buggy Is Rugged

Editor's Note—This story is about Charles Saltzer's trip to Baja California. Saltzer, a 1967 Metallurgical Engineering graduate of the Colorado School of Mines, returned from South Vietnam in June 1970 after serving as a civilian adviser to the 34th Group commander for six months. He currently works for AVSCOM while at ARADMAL in Corpus Christi, Tex. The story was published in the Jan. 26, 1970 Corpus Christi Caller-Times and was sent to us by Ralph Wolf, Met.E. 1968.

THEIR brakes failed, they lost a tire, bent a tie-rod and it took them 60 hours of rugged dusty driving but Charles Saltzer and Dennis Jebens of Corpus Christi accomplished their goal—they conquered Mexico's Baja peninsula.

Saltzer, of 4443 Ocean Drive, and Jebens, 3926 Panama No. 222, set out Oct. 15 in a dune buggy they converted from a Volkswagen on a trip that they had been thinking out for about a year.

With the buggy loaded with camping equipment, extra water and 28 gallons of gasoline, they crossed through Mexico, across to the Baja, then north to San Diego, Calif., and returned to Corpus Christi Nov. 1 through Arizona, and New Mexico.

Back in the comforts of "civilization" Saltzer and Jebens told of the grueling 991-mile trek up the Baja which took them six days, averaging 10 hours a day driving, to make.

Jebens summed the trip up in one word—"Bad."

Only about one-third of the Baja is paved road, the rest a one-lane conglomeration of meandering tire ruts, chug-holes, rocks, dry lake beds, and "bottomless sand" said the adventurous pair.

They told of getting stuck, trying to help another traveler out of soft sand, losing a tire about five miles from the start of a multilane toll road on their final leg of the journey, and finding a German mechanic about midway on the Baja to repair a bent tie-rod, and their brakes going out even before getting to the Baja.

Leaving Corpus Christi on Wednesday, they crossed into Mexico at Roma, traveled through Monterrey and Saltillo, and made camp that night near Torreon.

They said they didn't experience much difficulty in going through customs; except for a customs agent, Jebens said, who didn't know what to register their dune buggy as. "The agent couldn't find a category for the

buggy, so he finally decided to list it as a 'convertible,'" Jebens explained.

Breaking camp Thursday, Oct. 16, they moved on through Durango and into Mazatlan where they stayed in a hotel until Saturday. Saltzer said the area had been hit by a hurricane, leaving some of the roads in bad shape, limited communications, and plenty of room in the hotels.

First Trouble—The first trouble of the trip occurred Saturday morning. The brakes went out on the buggy while they were preparing to board the ferry boat to take them across the Gulf of California to La Paz, on the southern end of the Baja.

"We drove onto the ferry with the other vehicles, hit the brakes and they went all the way to the floor," Jebens said. For the rest of the trip, they used the emergency floor brake, although Jebens said, "It wasn't really necessary as we seldom got out of second gear on the Baja."

The ferry trip, on a converted Japanese-made ship operated by the Mexican navy, took 17 hours.

Arriving later in La Paz, they and their brake-less dune buggy began their Baja expedition Sunday morning.

They made 175 miles that first day. "Of course 150 miles of it was on paved highway," Jebens said.

Their first night on the Baja trip was spent near Santo Domingo, a small farming community. "Most of the places on the Baja," Saltzer explained, "were small farming communities or small ranches—the southern part of the Baja is largely an agricultural area." Jebens added that near the Pacific Ocean side, most of the places were "turtle fishing communities, with just a few shacks."

Monday, they made 110 miles without much difficulty and camped that night near the village of San Juanico.

Western Part—They had decided to keep to the western part of the Baja because some of the better roads on the eastern side had been covered by an earlier landslide near Santa Rosalia.

Tuesday began two days of most of their difficulties. They got stuck, had minor car trouble, and got lost a couple of times.

"Everytime we would ask directions and the condition of the road ahead, the people would just point north and say 'muy malo,'" Saltzer said. Jebens said, "You'd find that most people made their own roads, and you'd drive up a steep mountain following a road, get to the top and find the road ended and you'd have to back down."

After a few dead-end roads, and misguided directions they found themselves on mud-flats near a lagoon Tuesday where they got stuck and bent a tie rod on the buggy. After getting involved with a man in a Volkswagen camper, who also got stuck, and several Mexican nationals in a small caravan who helped them, they finally reached San Ignacio where they found a mechanic and a hotel. They made 90 miles that day.

Jebens said the mechanic's garage in San Ignacio was owned by a German who had been in Mexico since 1912. "His son pounded out the tie rod and greased the front end of the buggy and charged us \$3," Jebens said.

That night they stayed in the hotel, which Jebens said was owned by a mandolin-playing elderly lady who he thought a dust bowl, which they said their first full meals and got their first bath in several days.

Dust Bowl—Leaving San Ignacio Wednesday morning, they went through a dust bowl, which they said was "bottomless sand."

They managed to get through without much trouble, although they said they were covered with sand and the engine was caked with it. Traveling 80 miles they made camp that night near El Arco which divides the Baja not only in the time zone but boundary-wise also. "The northern part of the Baja is a state of Mexico while the southern part is a territory," Jebens said.

From Thursday on the pair made good time as the roads got better into Tijuana. They made 154 miles Thursday, 149 miles Friday, and 224 miles Saturday driving to the Mexican-U.S. border.

Last Stretch—It was on the last stretch Saturday when they lost the wheel. "The lug bolts worked themselves loose on the wheel and we were about five miles from paved road when it came off and rolled past us," Jebens explained.

With the wheel back on, they crossed the border and drove into San Diego, and after visiting relatives headed back to Texas.

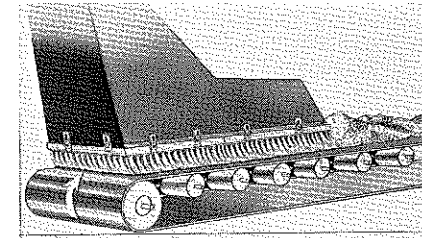
"We had our first trouble with police in Arizona," Saltzer laughingly said, "A policeman stopped us on the highway to check our brakes, lights, windshield wipers and other safety equipment but finally let us go on. We thought we'd have trouble in Mexico but we didn't."

Both said they were impressed with the people's friendliness and helpfulness during the Baja trip, and added they were "lucky" to finish the trip.

With the Manufacturers

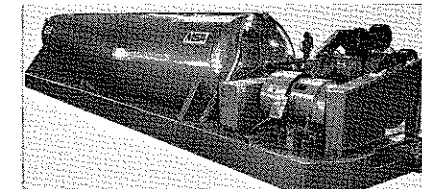
COAL-Q-LATOR (302)

A Coal-Q-Lator, a copyrighted slide rule developed by The Salem Tool Co., 5 Ellsworth Ave., Salem, Ohio 44460 for use with its coal recovery drills, permits mine operators to calculate how much coal can be recovered from a seam by auger mining. The Salem Coal-Q-Lator has been designed to utilize figures concerning seam heights and highwall lengths; single, dual and tri-head coal recovery drills by hole diameter and length, rig thicknesses and cutting head diameters. Circle 302 on Reader Service Card.



CONVEYOR BRUSHES (303)

Schaefer Conveyor Skirt Board Brushes (Schaefer Brush Mfg. Co., 117 W. Walker St., Milwaukee, Wis. 53204) improve bulk conveyor operation because they provide a positive seal with no spillage or belt wear. Firm brush action disallows material creepage beneath the skirt. Precision engineered and constructed of the proper combination of material, size weight and spacing, these brushes are easy to install . . . easy to adjust. Circle 303 on Reader Service Card.



ROCKDUST DISTRIBUTION (304)

A significant advance in pneumatic conveying of rockdust in coal mines has been developed by Mine Safety Appliances Co., 4 Gateway Center, Pittsburgh, Pa. 15222. The new M-S-A Pressure Tank Rockdust Distribution System can convey material seven to ten times farther than conventional rockdusters, at rates five to six times greater, and with less horsepower and less manpower. The end result is more efficient rockdust distribution at lower cost. Circle 304 on Reader Service Card.

MAGNETIC COUPLING (308)

The Tormag Magnetic Coupling, recently introduced by the Industrial Products Division of Fairchild Hiller Corp., Winston-Salem, N.C. 27105, is a permanent magnet eddy current slip coupling used to transmit power from a source to a load. Available in integral sizes from 1 HP to 20 HP and in fractional sizes from 1/4 HP to 3/4 HP, the Tormag Magnetic Coupling is designed for efficiency of power use and to provide softer starting characteristics. This permits the use of smaller motors on high inertia loads, or lighter gearing on high shock loads. Necessary power input on starting is also low. Circle 308 on Reader Service Card.

IBM'S NEW LASER (310)

A laser whose light has the shortest wavelength so far reported has been developed by an International Business Machines Corporation scientist. The light has wavelengths near 1600 Angstroms in the vacuum ultraviolet region—corresponding to a photon energy of almost 8 electron volts. The new laser provides a potentially valuable tool for study of chemical reactions and the interaction of very high energy light with matter. Developed by Dr. Rodney T. Hodgson of IBM's Research Division, the new laser utilizes molecular hydrogen as the active medium. The device is pumped by a high-voltage electrical discharge which raises the hydrogen molecules to excited vibrational-rotational levels of an excited electronic state. As the molecules drop back to excited vibrational levels of the ground state, they emit light of nine different wavelengths close to 1600 Angstroms. See Aug. 24, 1970 issue Physical Review Letters. Circle 310 on Reader Service Card.

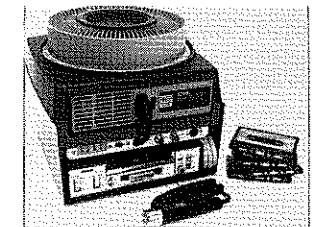


POCKET WATER PURIFIER (306)

Safe drinking water can be prepared in minutes anywhere by anyone with a battery-powered electronic water purifier recently introduced by Abtronics, Inc., P.O. Box 712, Livermore, Calif. 94552. The new device, called DrinkKit, easily fits in a shirt or vest pocket, or a lady's purse. DrinkKit quickly converts a pinch of ordinary table salt in a tablespoonful of water by electrolysis into a fresh concentrated solution of free chlorine and other powerful bacteria destroying compounds. Each charge is sufficient to rid up to a gallon of water of the microbes that cause digestive and intestinal upset and illness. This effective treatment is the same as is used for sterilizing most city water supplies. It imparts no objectionable chemical taste or odor to the water. Circle 306 on Reader Service Card.

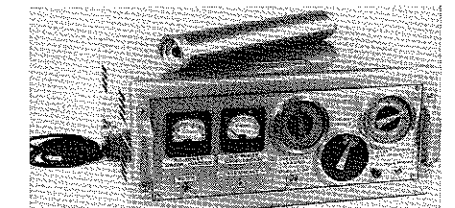
BOLTING-SCALING JUMBO (305)

Acme Machinery Co., Huntington, W. Va., announces a new Roof Bolting and Scaling Jumbo. Identified as the Model RBSD, this unit has four wheel diesel engine drive with two wheel steer. One man cage for installing bolts and scaling in addition to one drill boom for roof bolt holes et cetera is standard equipment on this rig. Four stabilizing jacks are also supplied for stability while drilling on grades. Circle 305 on Reader Service Card.



MONTAGE/NARRATOR (307)

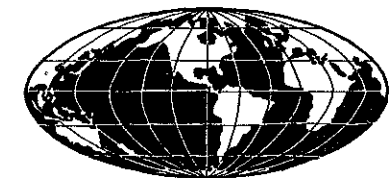
A new tool for industry to prepare sales and promotion programs is the Montage/Narrator 850, a self-contained compact/cassette audio synchronization system designed to present fully automated sound/slide programs when integrated with Kodak Carousel and Kodak Ektagraphic remote-control slide projectors. The Narrator 850, manufactured by Montage Productions Inc., 49 West 27th Street, New York 10001, combines the flexibility of 35 mm slides, the added dimension of sound and the convenience of an audio compact/cassette system to create highly professional yet inexpensive sales, teaching, training and promotional presentations for audiences from a roomful of clients or students in an auditorium. Circle 307 on Reader Service Card.



BORE HOLE SURVEY UNIT (309)

A new bore hole survey unit that provides continuous, three-angle readouts on a surface display including azimuth orientation, slant angle heading, and slant angle measurement has been announced by Humphrey, Inc., 2805 Canon St., San Diego, Calif. 92106. The new unit eliminates the need for extensive computations and the use of tables to get precise information on drill wandering. Circle 309 on Reader Service Card.

CONSULTING ENGINEERS IN THE APPLIED EARTH SCIENCES



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DAMES & MOORE

Plant News



Longyear

Robert D. Longyear Dies

Robert D. Longyear, honorary chairman of the Board of Directors of the E. J. Longyear Co., well known internationally throughout the mining industry, died in Minneapolis on May 20, 1970.

In 1914, he received his B.A. Degree from Williams College, and in 1915 his M.S. Degree in geology from the University of Wisconsin. He began his professional career with Longyear as geologist in charge of the highly successful diamond core drilling exploration program at the now famous Falconbridge nickel deposit near Sudbury, Ontario. He held the office of president from 1924 to 1958 and was then elected chairman of the Board of Directors, a position he held until early 1969 when he became honorary chairman.

Robert Longyear devoted his entire adult life in service of his fellow men and the business community of which he was an outstanding member. It was through his wise and skillful leadership that the E. J. Longyear Company has become a successful international company and a leader in the development and manufacture of diamond core drilling equipment and the largest world-wide supplier of contract drilling services.

Consolidation Coal Promotions

Two top operating officials of Consolidation Coal Co., Ralph E. Bailey and Charles R. Nailler, have been named to the firm's Board of Directors, it was announced by John Corcoran, president of Consol. At the same time it was announced that Bailey, former senior vice president, has been named an executive vice president.

\$10 Million WABCO Order

A contract to build 36 new WABCO Model 120B Haulpak trucks, valued at approximately \$10 million, for Hamersley Iron Pty. Ltd., for use at a major iron ore body in Western Australia, was announced recently by Richard M. Mitchell, vice president and general manager of WABCO's International Manufacturing Operations Division. WABCO is an American-Standard company.

Ayrshire Will Supply Coal To Indiana Public Service

Ayrshire Coal Co., a division of AMAX (American Metal Climax, Inc.), has entered into an agreement, valued at more than \$500-million, with Public Service Indiana. Ayrshire will supply 80-million tons of coal from an underground mine that it will develop in the Keensburg area of southeastern Illinois. Shipments will be made over a 30-year period at a maximum rate of 3.6-million tons a year. Estimated cost of developing the new mine is in excess of \$25 million. Initial production is expected to start late in 1973.



O'Rourke

Brown & Root Appointment

Brown & Root, Inc. has announced the appointment of John T. O'Rourke as manager-Mining and Metallurgical Sales. In this capacity, he will be responsible for coordinating and directing Brown & Root's over-all sales activities in the ferrous, non-ferrous, and mining industries.

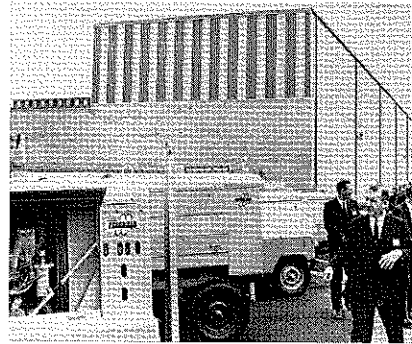
O'Rourke is a graduate of Drexel Institute of Technology, a professional engineer licensed in the state of New York, and attended graduate school of Columbia University. Brown & Root of Houston, the nation's largest engineering and construction company, is a subsidiary of Halliburton Co., Dallas.

New Chemical Techniques For Pollution Control

A breakthrough in bringing new chemical techniques for pollution control into practical use has been announced by American Cyanamid Co. as it reached full-scale production at its new sulfuric acid plant in Linden, N. J.

The plant, together with new air pollution control facilities for other production units at Cyanamid's Warners plant complex in Linden, involved an investment of some \$6,500,000.

Thomas P. Turchan, Met.E. 1935, Cyanamid vice president, attributed one-third of this new investment to pollution-control devices. He said the sulfuric acid plant is the first of its type in the Western Hemisphere with respect to pollution abatement.



WORLD'S LARGEST PORTABLE COMPRESSOR manufacturing plant, including a new \$10-million computerized machining facility of Ingersoll-Rand Co.'s Portable Compressor Division in Mocksville, N. C., is inspected at a recent dedication event by Lt. Gov. Pat Taylor of North Carolina. A blast of compressed air from a new I-R Whisperized portable compressor was used to split a ribbon to open the dedication ceremony.

American Cyanamid Merger

Completion of the merger of The Ervin Co., a developer of residential communities in the Southeast, into a wholly-owned subsidiary of American Cyanamid Co. was announced recently by Clifford D. Siverd, president of Cyanamid, and Charles C. Ervin, founder and board chairman of Ervin.

Air Pollution Control Market

The U.S. air pollution control program will expand substantially during the next 10 years. Air pollution damages may well result in economic losses of \$10 to \$20 billion annually. The market research firm of Frost & Sullivan has just published an in-depth analysis and forecast of the *Air Pollution Control Equipment Market*.

Marathon-LeTourneau Merger

Marathon Manufacturing Co. and the LeTourneau Foundation have agreed to the acquisition by Marathon of the controlling interest in R. G. LeTourneau, Inc. of Longview, Texas.

LeTourneau manufactures large electrically-powered equipment for the earthmoving, logging, materials handling and land clearing industries. It also is a leader in the manufacture of jack-up type mobile offshore drilling platforms.

Rubenok Named Chief Geologist

Roy Rubenok has been named chief geologist of Century Geophysical Corp. of Canada, it was announced by Peter I. Bediz, Geol.E. '41 and M.Sc. '42, president, and Hugh Evans, Geol.E. '49, manager. Century of Canada is a wholly owned subsidiary of Century Geophysical Corp., Tulsa, Okla.

Rubenok is responsible for technical applications, modifications and quality control in acquisition and processing of geophysical data.

Catalogs and Trade Publications

GRAVITY CONCENTRATOR (400)

C. Tennant, Sons & Co., 100 Park Ave. New York, N.Y. 10017, offers a new, highly technical brochure on the new Bartles-Mozley "Orbital" gravity concentrator. This new rugged machine is capable of economically recovering extremely fine fractions of valuable heavy minerals from previously low yielding or untreatable mine tailings, slime and pulp. To date it has been successfully run on cassiterite, scheelite and wolframite with excellent recovery yields and with particle recovery ranging down to 5 microns. It is applicable to any heavy metal or ore normally recoverable by gravity. Circle 400 on Reader Service Card.

CAR SHAKER (401)

A complete line of Car Shakers is described in a new catalog issued by National Conveyor & Supply Co., 350 N. Harding Ave., Chicago, Ill. 60624. Car Shakers are used to compact bulk materials to facilitate their loading into hopper cars as well as to free up frozen or compacted materials prior to unloading. The catalog discusses various methods of loading and unloading, describes the company's companion line of Jib Cranes and provides complete prices and specifications. Circle 401 on Reader Service Card.

EPOXY CRUSHER BACKING (402)

A reformulated Epoxy Crusher Backing (ECB) for bowl liners and mantle heads in cone type crushers is being marketed by ESCO Corp., a leading manufacturer of wearing parts for all types of rock crushers. With the addition of ECB to its product line, ESCO now offers customers a single source for crusher wearing parts and installation materials. Catalog #805 describing ECB has been prepared by ESCO. It includes recommended quantities of the backing needed for major manufacturer's models of cone crushers. Information may be requested from the ESCO Corp., Dept. DP, 2154-6, N.W. 25th Ave., Portland, Ore. 97210. Circle 402 on Reader Service Card.

ION EXCHANGE RESIN (403)

A new bulletin on Amberlite IR-120 Plus ion exchange resin is available from Rohm and Haas Co., Independence Mall West, Philadelphia, Pa. 19105. Amberlite IR-120 Plus is a new, premium-quality, high-capacity cation exchange resin designed for use in industrial water softening, dealkalization, deionization and chemical processing applications. The bulletin reviews the product's important features, physical and hydraulic characteristics and suggested operating conditions. Other topics described are hydrogen and sodium cycle operation and applications. Circle 403 on Reader Service Card.

CONTINUOUS MINERS (404)

Two new two-page bulletins on its rotary drum continuous miners for low and high coal seams are available from Joy Manufacturing Co., Oliver Bldg., Pittsburgh, Pa. 15222. The bulletins illustrate and describe the 10CM-2 continuous miner for high coal, and the 11CM-1 continuous miner for low coal. Included are specifications and dimensional drawings of both machines. Continuous mining machines are also used to mine potash, trona and other bedded deposits. The 10CM-2 bulletin is designated J-424, and the 11CM-1 is designated J-425. Circle 404 on Reader Service Card.

SAFE OPERATING PRACTICES (405)

"Safe Operating Practices for Crane and Hoist Users" is the title for a completely new booklet published by Harnischfeger Corp., Milwaukee, Wis. 53246. The booklet represents the results of more than a year's study of recommended crane and hoist safe operating and maintenance procedures obtained from a wide variety of sources including major trade associations and several private corporations as well as major contributions from Harnischfeger's own service, engineering and safety departments. The contents cover such items as physical and mental requirements for crane operators; daily, weekly, monthly and special equipment inspection procedures; as well as the "do's" and "don't's" of safe operation and maintenance programs; a list of principal components for frequent inspection and a chart of the Standard Hand Signals for floor personnel working with cranes. Circle 405 on Reader Service Card.

GRADER BOOKLET (406)

A handy, pocket-sized booklet titled "Great Grading And How" is offered by the Austin-Western Division of Baldwin-Lima-Hamilton Corp., Aurora, Ill. 60507. The 28-page reference gives equipment operators quick tips and techniques for getting the most out of all-wheel drive and steer power graders, both on such "routine" grader jobs as ditching, bank sloping, rough and fine grading, and scarifying, and on the less-routine

Send Us Your Bulletins

Send your publications to The MINES Magazine, 2177 W. 7th Ave., Denver, Colo. 80204, for review in these columns. To all MINES readers these publications are FREE, and may be ordered by giving index number. On requesting publications from manufacturers, please mention the MINES Magazine.

work such as bulldozing and winter-time snow-plowing operations. To help operators apply the machine's capabilities to best advantage in specific situations, the bulletin makes generous use of line drawings and action photos, supplementing the text. For finish-grading shoulders or slopes without leaving tire marks, for example, the bulletin notes, your grader needs a wide reach. "To get the widest possible reach, you have to steer your grader into an offset position, rear wheels all the way toward the heel of the blade, blade sideshifted hydraulically all the way to the right, highlighted to proper slope angle, and circled to cast the dirt as required." Circle 406 on Reader Service Card.

RIBBON CABLES (409)

A new full-color 6-page catalog on FRC Fabri-Cable high quality woven ribbon cables has just been released by the Zippertubing Co., 13000 S. Broadway, Los Angeles, Calif. 90061. The catalog shows a large array of design possibilities and features of FRC woven ribbon cables, including controlled impedance cable, permanent accordion folded cable, cable with color coding, leads furnished to design specifications, integral strain relief tabs, multi-layer cable, flat cable with heavy duty insulation, specialty weaves, woven unisulated conductors, zip weave for quick lead exposure, combined electro-pneumatic cable, mixed size and function cable, twisted pairs, short jumpers, custom breakouts and woven harnesses, flat coax cable, woven shielded cable, fold and strip line, woven branches, and Zippertubing materials for finishing and protection. Circle 409 on Reader Service Card.

SYSTEMS ENGINEERING (410)

Now available free from General Automation, Inc., Orange, Calif. 92661, is a services brochure on the company's systems engineering capabilities for industrial automation projects. Titled "Systems Engineering," the eight-page, two-color, illustrated brochure describes such GA services as engineering consultation, project engineering, product development, and major OEM procedures. It also covers the company's technological qualifications and lists typical examples of GA systems experience. Circle 410 on Reader Service Card.

PINCH VALVES (411)

Catalog 359, available from Walbridge Co., 803 Patterson Bldg., Denver, Colo. 80202, describes and illustrates Jaco Pinch Valves used for efficient handling of abrasive pulp and corrosive fluids. Advantages are listed as strong rigid construction, long life under severe conditions, no metal parts in contact with material or fluid, minimum friction loss, cannot leak or stick, unobstructed flow passage, positive closure on solids. Sizes 1" to 12" are available. Circle 411 on Reader Service Card.

SOIL STRENGTH DEVICE (412)

A new bulletin on the Torvane, an instrument used to determine the shear strength of cohesive soils, either in the field or in the laboratory, is available from Solltest, Inc., 2205 Lee St., Evanston, Ill. 60202. The Torvane instrument may be used by engineers, boring inspectors, consultants, testing companies, contractors, public utilities, agronomists and governmental agencies. Shear strength of soil can be determined rapidly by checking the soils in the ends of tube samples, penetration samples, chunk samples from test pits and excavations, and in-place in test pits or foundations. Circle 412 on Reader Service Card.

METAL LOCATOR (413)

A new four-page bulletin on metal locators has been issued by Geophysical Instrument & Supply Co., 900 Broadway, Denver, Colo. 80203. Illustrated and described in the bulletin are a metal and treasurer locator which has a deth operating capacity to approximately 60 inches. The lightweight unit weighs only 3 lbs. and is battery operated so that it can be hand held to locate almost any object whose conductivity is greater than the surrounding medium. Circle 413 on Reader Service Card.

DRUM PULLEYS (414)

Van Gorp Manufacturing, Pella, Iowa 50219, is now producing machined face drum pulleys in small diameters, from 4 to 8 inches, and face widths of up to 66 inches. The smaller steel drum pulleys of the Von Gorp True-Turn line with machined face finishes will provide the maximum concentricity to assure alignment, smooth functioning and safe high speed operations. Circle 414 on Reader Service Card.

RAF SYSTEMS (415)

New 4-page 3-color brochure (2.110B) fully describes "RAF" Systems which have been especially developed by Robbins Aviation, Inc., 3817 Santa Fe Ave., Vernon, Calif. 90053, to assure total purification of compressed air for respiratory use—not just "filtering" and "drying." Featured is the Model RAF-8197-30-ARS which has a separate extra dry chamber for total elimination of Carbon Monoxide, is equipped with an electronic Dewpoint Monitor to safeguard the System's performance, and provides for automatic drainage of waste liquids. Circle 415 on Reader Service Card.

CAT 140 MOTOR GRADER (416)

Caterpillar has completed a 16 page four color catalog on (AE020051) on its new 140 Motor Grader. The booklet points out some of the outstanding features of the new grader, among them a 150 HP engine with a 25% torque rise; and adjustment free fuel system and a 250 hour engine oil change interval. Circle 416 on Reader Service Card.

SPECTROPHOTOMETER SYSTEM (417)

The Automatic DB-G Spectrophotometer System is the title and subject of a new two-page bulletin just released by Beckman Instruments, Inc., 2500 Harbor Blvd., Fullerton, Calif. 92634. Bulletin 7166 illustrates and describes the new fully automated ultraviolet-visible system which analyzes up to 200 samples at single or multiple wavelengths without an operator present. Also included are the system's features such as module combinations to tailor the instrument to specific applications and standby circuitry in case of loss of power during a cycle. Circle 417 on Reader Service Card.

"NAVAL JELLY" (418)

"Now made in a special industrial strength, well-known "Naval Jelly" rust-remover is being marketed exclusively in the industrial field by Sprayon Products, Inc., 26300 Fargo Ave., Bedford Heights, Ohio 44146. It has a powerful chemical action that dissolves rust quickly and floats it away, according to the maker. Sprayon "Naval Jelly" is a tacky gel that is quickly and easily brushed, dipped or poured onto the rusted area. It stays in place on vertical and overhead surfaces. Its consistency is virtually unaffected by heat or cold. After a period of five minutes to several hours, depending on the thickness of the rust, the gel is hosed off with plain water, taking all the rust with it and leaving clean metal. Circle 418 on Reader Service Card.

GENERAL BULLETIN (419)

Carman Industries, Inc., 1005 W. Riverside Dr., Jeffersonville, Ind., 47130, material handling equipment manufacturers, has issued a new General Bulletin (No. 1000) describing its numerous products in the field. The equipment includes vibrating bin bottoms, gyrated and whirlpool types; draw down hoppers, vibrating feeders, vibrating conveyors, densifiers as well as vibrating mixers and dryers. Separate bulletins are issued on each of the company's products and their request numbers are specified in the general bulletin. Circle 419 on Reader Service Card.

OIL WELL DRILLING (420)

A complete line of torque, weight and pressure instruments and controls for oil drilling are covered in a new 28-page catalog available from Martin-Decker Corp., 1928 S. Grand Ave., Santa Ana, Calif. 92705. The catalog, which will be sent to readers on request, illustrates and describes each of the many instruments used to measure, record or control most operations performed on a modern well run drilling rig. The catalog also contains sufficient data on most of the products for the prospective user to determine if the item will fit his application. Circle 420 on Reader Service Card.

BABY COMPUTER (421)

A new device, a "baby computer" marketing for less than \$200, offers a completely new approach to business cost control. Job clocks, time cards, even adding machines, and all clerical effort to determine the cost of labor are entirely eliminated. The device, Cost Computer, Model C-100, reports total job labor in dollars and cents or other monetary units. (Cost Computer Corp., 1001 S. Elm St., Greensboro, N.C. 27406.) Circle 421 on Reader Service Card.

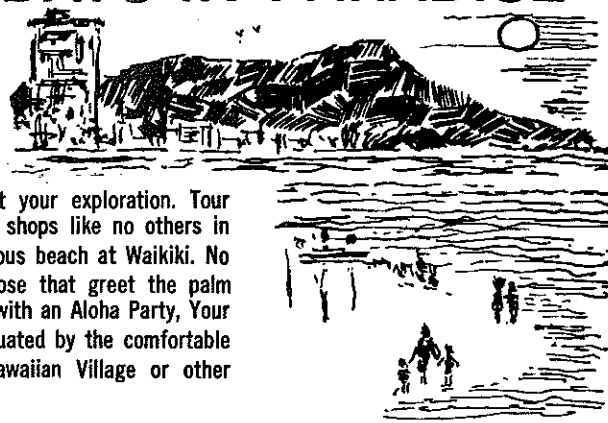
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2 nights in KONA

KONA PARADISE—Your jet plane will land in still another Hawaiian Paradise, Kona. You'll be caught in the excitement of the Kailua-Kona fishing fleet—you'll enjoy the best cup of coffee in the world made right on the spot from the famous Kona coffee bean. It will be served at the beautiful Kona Hilton or other luxurious hotel. Then to...

HILO PARADISE—Your Kona visit will end with a scenic trip across the big island of Hawaii to Hilo where you will explore the colorful Orchid fields, the incredible volcanic craters and cascading waterfalls. The majestic slopes of 13,784 foot Mauna Kea will serve as your backdrop. And then a jet airliner for your trip home filled with all the memories of the most wonderful vacation imaginable.

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DEPARTURE DATE _____ DEPARTURE CITY _____

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Mineral Industries

Exploration Practices Code Endorsed by CMA

The Colorado Mining Association Board of Directors has endorsed the following "Code of Exploration Practices."

As evidence of our concern that a quality environment be maintained and as a demonstration of our interest in adapting to sound ecological practices as we search for new mineral deposits, we voluntarily subscribe to the following ten point "Code of Exploration Practices," as recommended by the Colorado Mining Association and will use our best efforts so that all of our employees and contractors comply with it.

1) Know and comply with the mining laws relating to exploration in Colorado.

2) Know and comply with Forest Service, BLM or other appropriate government agency's rules and regulations.

3) Establish and maintain cordial relations with land owners and/or lease holders in the area of the activity.

4) Avoid harmful impacts upon the environment.

5) Keep excavation (roads, drill sites and cuts) at a minimum.

6) Conduct all activities in the manner which minimizes danger of man-caused fires either in timber lands or grass lands.

7) Drive vehicles and conduct other activities in a manner such as to minimize disturbance of people and livestock in the area.

8) Do not hunt or fish on private lands except with full permission of the land owner.

9) Use no timber, water or other resource on private land without permission of the owner.

10) Promptly initiate negotiations with the owner for settlement of any claims for damages resulting from activities of the exploration group or contractors.

Copies of the "Code" with space for endorsement by operating companies are available for distribution through the Colorado Mining Association, 402 Majestic Building, Denver, Colo. 80202 and the Colorado Bureau of Mines, 215 Columbine Building, Denver, Colo. 80203.

Anthracite Mining Services

Receipts for anthracite mining services in 1967 were valued at \$9.2 million, a decrease of \$6.4 million from 1963, year of the last previous Census of Mineral Industries, according to a preliminary report of the recent census just issued by the U.S. Department of Commerce's Bureau of the Census.

Mitsui Forms Alaskan Development Team

Mitsui and Company, Ltd., the world's largest trading firm, has formed an Alaska Development team. This team is to be a technically oriented body formed to analyze Alaska's potential and to make recommendations to company directors on investment opportunities. Personnel on the team represent various company departments such as iron and steel, non-ferrous, machinery, chemical, food-stuffs, petroleum, coal, lumber, general merchandise, rubber traffic and insurance, and administrative.

The company reports that the first project of the team will be to study Alaska's potential developments in natural resources such as coking coal, copper ore, and other nonferrous metals.

Consol Awarded Contract For Low-Sulfur Fuel Process

Consolidation Coal Co. has been awarded a \$280,916 Federal research contract to obtain the basic information needed to demonstrate a new process for producing electricity from high-sulfur steam coal without polluting the atmosphere.

The contract, awarded by the National Air Pollution Control Administration, is for establishing the feasibility of converting high-sulfur coal into producer gas and/or char for use as a low-sulfur boiler fuel.

A Consol spokesman said, "The concept is of particular interest to new power stations which use both gas and steam turbines." The contract covers just the initial phase of the four-phase project. The work will be carried out at Consol's Research and Development Division Laboratories at Liberty, Pa., a Pittsburgh suburb.

The experimental program will use a so-called carbon dioxide-acceptor unit developed by the coal firm.

New Jersey Zinc Sells Holdings in New Mexico

The New Jersey Zinc Co. has announced it will no longer be involved in currently active mining ventures in Grant County, N. M. A sale of all assets in Grant County has been consummated with U.S. Smelting, Refining and Mining Co. The Oswaldo Mines, as required in the lease, will be returned to Kennecott Copper Corp., and control of the Hanover property will pass on to U.S. Smelting, Refining and Mining Co.

U. S. Bureau of Mines Asst. Director Named

Sheldon P. Wimpfen, a mining executive and professional engineer from Denver, Colo., has been appointed assistant director-Mineral Supply in the Interior Department's Bureau of Mines. With his appointment, Wimpfen takes on responsibility for the Bureau's broad and varied program of economic, statistical, and other fact-finding activities which are essential to Bureau efforts to assure the United States reliable supplies of minerals and fuels.

Exercising top-level supervision of wide ranging Bureau investigations into the commercial potential of domestic mineral and fuel deposits, Wimpfen will also have immediate responsibility for providing the government with timely intelligence on important nationwide and worldwide developments in mineral resources and mineral industry activities. Aided by a professional headquarters staff in Washington, D.C., he will direct the activities of field operation centers in Juneau, Alaska; Pittsburgh, Pa.; Denver, Colo.; and Spokane, Wash., and related mineral supply offices in California, Oregon, Minnesota, Tennessee, Texas, and Oklahoma.

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Geological Engineer

Delmer L. Brown, '63
Geological Engineer

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From the Local Sections

Section news should be in the Alumni Office by the 20th of the Month preceding Publication.

SECTION	PRESIDENT	VICE-PRESIDENT	SECRETARY-TREASURER	TIME AND PLACE OF MEETING
Alabama Birmingham			Wm. Haynes, '54	On call of the president.
Alaska Anchorage			Ken Clodfelter, '51 2402 E. 49th Ave. Anchorage, Alaska 99502	
Arizona Arizona	Guerdon E. Jackson, '52	W. E. Saegart, '53	James D. Sell, '55 2762 W. Holladay St. Tucson, Ariz. 85706	Annual Meeting, Dec. 7, 1970, Western Motel, Tucson.
California Bay Cities	Carl Foget, '61	Dave Strandburg, '61	Tom Aude, '62 54 Woodford Drive Moraga, Calif. 94556	Meetings held on call of the Secretary.
Santa Clara Valley Sacramento	Gail Penfield, '56		Stanley Y. Ogawa, '53	
San Joaquin Valley Southern California	R. A. Ganong, '47 Bob Snyder, '67	Marsh Chapman, '38	F. B. Sweeney, '57 6619 Auburn Blvd., Citrus Heights B. A. Ellison, '61	
Colorado Denver	A. E. "Ted" Seep, Jr., '68	Hal Kellogg, '55	Bob Goverski, '64 (Sec.) Phone: 213 — 349-4155 Clark Wollenwoeber, '63	Nikolas Restaurant, 1449 W. Sunset, Los Angeles, 2nd Thursday of each month.
Grand Junction	Robert F. Barney, '35	Roy C. Kirkman, '66	Jack Dressel, '50	Luncheon meeting held third Tuesday of each month, Denver Press Club, 1330 Glenarm Pl.
District of Columbia Washington	A. A. Wyner, '25	Louis DeGoes, '41	Robert P. Moston, '58 1359 Bunting Ave. Hal Cronin, '26 106 Buxton Dr. Falls Church, Va. 22040	Regular meeting at noon, second Tuesday of each month at the Shrine Temple, 1315 K St. N.W.
Illinois Great Lakes	C. R. Fitch, '49 7915 Exchange Ave. Chicago 17, Ill.		James Daniels, '51 307 Schweitzer Bldg., Wichita, Kans. AM 5-0614.	Meetings called by secretary. Contact secretary for date of next meeting.
Kansas Wichita	Francis Page, '39		Monte Richard, '60 Pan American Petr. Corp. P.O. Box 50879 New Orleans, La. 70150	Regular luncheon meetings — last Wednesday of the odd-numbered month except July.
Louisiana New Orleans	Charles Tyler, '53	Joseph L. DuBois, '50	Stephen D. Chesebro, '64 P. O. Box 51345 Lafayette, La. 70501.	Regular luncheon meetings at Lafayette Petroleum Club on fourth Thursday of each month.
Lafayette	John J. Wallace, '51	Edward J. Gibbon, '68		
Minnesota Iron Ore Range	Paul Shanklin, '49			
Missouri St. Louis			E. W. Markwardt, '32 104 E. Monroe St. O'Fallon, Ill. 62269	
Montana Butte	John M. Suttle, '42 Continental Dr. Butte			
Nevada Northern Nevada	Paul V. Fillo, '40	H. R. Fitzpatrick, '36	James H. Bright, '52 1450 E. 2nd St. Reno, Nev. 89502	Meetings held four times per year at call of the Secretary.
New Mexico Carlsbad	John Magraw, '53			
Four Corners	Lou Amick, '50	Al Loleit, '50	N. E. Maxwell, Jr., '41 405 S. Church St. Aztec, N.M. 87410	Special meeting at the call of the president.
New York New York	Robt. B. Kennedy, '38		E. T. Benson, '33 1175 Broadway, New York, N. Y. Raymond M. Schatz, '25 Battelle Memorial Institute Columbus	Meetings on call every month or six weeks from September to May, usually at Uptown Mining Club, 49th and Park Ave.
Ohio Central Ohio				
Cleveland	Harold M. Knudsen, '58	Theodore Solim, '53	Robert Feige, '66 9 WW—Frank Phillips Bldg.	Meetings held on call of president.
Oklahoma Bartlesville	Bill Frederick, '56	Charles Strong, '58		Regular meetings held every Tuesday at noon, YWCA, 411 S. Johnston St.
Oklahoma City	Ed Johnson, '49 844 First Nat'l Bldg.			Regular meeting held at call of the president.
Tulsa	Todd C. Storer, '47		Jerry McLeod, '57 1706 East 80th Pl. Tulsa, Okla. 74105	Meetings held at call of the president.
Oregon Lower Columbia River Basin	Michael DiLembo, '58	D. H. Griswold, '30	Wendell Cloepfl, '62	On call of the president.
Pennsylvania Eastern Pennsylvania	Samuel Hochberger, '48	Arthur Most, Jr., '38 1345 Woodland Cr., Bethlehem		
Pennsylvania-Ohio	Vincent G. Giola, '56		David P. Rihl, '58 Dravo Corp., Pittsburgh and Terrace Rd., Carnegie, Pa. 15106	Meetings held first Wednesday of each month (noon), Cafe "B," Golden Triangle YMCA, 4th and Wood Sts., Pittsburgh.
Texas Coastal Bend	Ray Gouett, '52	Charles R. Russell, '54	Irwin M. Glasser, '43 Humble Oil & Refining Co. Corpus Christi, Tex. 78401	Luncheon Meeting — First Wednesday of each month at the Petroleum Club.
El Paso	Peter A. DeSantis, '51	William F. Dukes, '50	L. G. Truby, '48 4320 O'Keefe Dr. El Paso, Texas 79902	Meetings held on last Wednesdays of January, March and May. Special meetings on call.
Houston	Ronald E. Diederich, '57	Edward B. Reynolds, '66	James K. Applegate, '66 Marathon Oil Co. 2300 W. Loop, South	Luncheon meetings held at 12 noon on first Thursday of each month at White Horse Cellar, 1211 Fannin St.

Grand Junction Officers Elected at Swim Party

On Aug. 29th the Grand Junction Section of the CSM Alumni held a swim party at the home of Elbert E. Lewis, Class of '42. As per usual, a good turnout was recorded and a grand old time was had by all.

The results of the nominating committee were presented in a poolside manner by Tony Setter, '32. The following Alumni were unanimously voted into office for the succeeding year:

President—Robert F. Barney, '35.
Vice-President — Roy C. Kirkman, '66.

Secretary-Treasurer — Robert P. Moston, '58.

There being no further formal business, this portion of the meeting was adjourned.

Arch F. Boyd, '26, retired from government service in July. Arch was given a fine farewell party by his fellow AEC employees. We all wish Arch a lot of happiness during his retirement years.

—Roy C. Kirkman

Charles T. Baroch Memorial

Shocked by the death of Charles T. Baroch, class of 1923, who had been an officer of the Washington, D.C., Section for many years, the local members contributed the sum of \$65 as a gift to the CSM Foundation, Inc., to establish a Memorial Fund in the

name of Charles T. Baroch. Twenty-five dollars of this amount will be used to purchase a brass name plate to appear under his class numeral in the Integral Club.

Other gifts to this fund will be announced by the CSM Foundation, Inc., as received.—WWF

Candidates for Alumni Offices

Candidates for CSM Alumni offices in 1971 are Harrison L. Hays, '31, for president; Neal Harr, '54, for vice president; Robert W. Dalton, '57, Albert Seep, '58, and Arthur G. Wood, '41, for secretary; Arthur T. Biddle, '61, David R. Cole, '52, and Thomas R. Young, '52, for director (3-year term); Harold W. Addington, '43, for director CSM Foundation, Inc. (2-year term).

Washington, D. C. Section Holds Its Annual Picnic

The annual picnic sponsored by the Washington, D. C., Section was held at the home of James C. Burritt, '31, in Great Falls, Va. Over the years, the number of Mines Alumni in Washington has become smaller. Earl (Mighty) Volin was at the picnic together with a substantial number of others.

The Coors beer was missing because of some decision here in Golden not to ship the usual supply to this group for a special occasion.

SECTION	PRESIDENT	VICE-PRESIDENT	SECRETARY-TREASURER	TIME AND PLACE OF MEETING
Permian Basin	Hal Ballew, '51	Harry B. Hinkle, '59	Al Wynn, '65 4313 Princeton, Midland, Tex. 79701	Meetings held in Jan., Mar., May, Sept., and Dec.
Dallas-Ft. Worth	Harold E. Potter, '27	Dewey D. Bowling, '49	Peter A. MacQueen, '50 P.O. Box 2050 Ft. Worth, Texas 76101	Meeting held on call of president.
South Texas			William A. Conley, '19 1515 Haskins Rd. San Antonio	Meetings held at 7 p.m. on first Thursday of February, May August, November at Old Town Inn, 416 8th St., San Antonio.
Utah Four Corners Salt Lake City	See N.M. for officers John Weber, '66		Gregory H. Hoyl, '68 1358 Kennecott Bldg. Salt Lake City, Utah 84111	Four meetings annually on dates set by officers.
Washington Pacific Northwest	Richard O. Barnes, '55		Robert R. Cederstrom, '60 11011 N.E. 9th St. Bellevue, Wash. 98004	
Eastern Washington			Arden Bement, '54	Meetings on call of president.
Wyoming Central Wyoming			George S. Rogers, '59 3209 Aspen Drive Casper, Wyo. 82601	
Canada Calgary	Richard C. Siegfried, '50 Canadian Superior Oil Ltd. 703 6th Ave., Calgary Tel.: 267-4110 Local 429			Calgary Section meets for a noon luncheon on the 3rd Monday of Sept., Nov., Jan., Mar., May—at Calgary Petroleum Club. Visiting alumni invited to attend.
France	Resident or visiting alumni may contact Bernard Turpin, '60, 33 Rue de la Tourelle, 92-Boulogne, France.			
Libya	R. E. Palmer, '61, Corresponding Secretary, c/o American Overseas Petroleum, P. O. Box 693, Tripoli, Libya.			
Peru	Martin Obradovic, '53			Meetings first Friday of each month (April thru December), 12:30 p.m. Hotel Crillon. Other meetings on call.
Philippines Bagulo Manila	Francisco Joaquin, '28 J. R. Kuykendall, 41	Jesus Jalondoni, '40	M. E. Natividad, '40 c/o Northern Motors United Nations Ave., Manila	Meetings held at noon, second Tuesday of each month.
Puerto Rico	Resident or visiting alumni may contact L. L. Hagemann, '60, Apt. 17, El Monte Apartments, Avenida Munoz Rivera, Hato Rey, Puerto Rico.			
Turkey Ankara	Alumni visiting Turkey contact Ferhan Sanlav, '49, Turkiye Petrolleri A. O. Sakarya Caddesi 24, Ankara, Telephone 23144.			
Venezuela Caracas	Z. Sancevic, '57	Jean Pasquall, '60	Ian Achong, '58 Cla. Shell de Venezuela Aptdo. 809, Caracas	

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Consulting Geologist
and Hydrologist

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Clyde E. Osborn, '33

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President
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P. O. Box 712 Casper, Wyo. 82601

C. Newton Page, '42

Consulting Geophysicist

Box 5572, Midland, Tex.

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THE COLORADO SCHOOL OF MINES ALUMNI PLACEMENT SERVICE functions as a clearing house for alumni and former students who wish to receive current information about employment opportunities for which they may qualify. It also serves the oil, gas, construction and related industries and many government agencies by maintaining current listings of openings they have for qualified engineers, technical and management personnel.

Companies needing qualified men with degrees in Geological Engineering, Geophysical Engineering, Metallurgical Engineering, Mining Engineering, Petroleum Engineering, Petroleum Refining Engineering, Engineering Physics, Engineering Mathematics, and Chemistry are invited to list their openings with the CSM Alumni Placement Service, Guggenheim Hall, Golden, Colorado.

Listed below are coded references to the graduates of the Colorado School of Mines who were available for employment at the time this issue of The MINES MAGAZINE went to press.

Client's Code Number	Degree	Age	Marital Status	No. of Children	Preferred Fields of Work	Locality Preferred	Languages Spoken
MN 34	Mining	39	M	1	Mining Geology	Western USA/Foreign	English/Spanish
MN 36	Mining	30	M	1	Open Pit or Underground	West, Northwest U.S.	English
MN 37	Mining	29	M	2	Production	Rocky Mountain or Western U.S.A.	English
MN 38	Mining	25	M	0	Mining— Open Pit or Strip	Domestic or Foreign	English
MN 42	Mining	23	S	..	Exploration, Prospecting		
MN 44	Mining	28	M	2	Manufacturing & Marketing	Open	English
MN 46	Mining	36	M	6	Exploration Development	S.W.-U.S.A. or Alaska	English
MT 47	Metallurgy	33	M	3	Mill Operation	West. U. S.	English
MT 48	Metallurgy	35	M	2	Development, Project Management	Colorado	English/Spanish
MT 50	Metallurgy	29	M	1	Mineral Processing Production or Engineering	Rocky Mountain States	English
MT 51	Metallurgy	26	S	0	Met. Engineering Systems analysis	Foreign	English
GE 34	Geol. Engr. Civil Eng.	39	M	3	Prefer Management	Open	English
GE 36	Geology	43	M	1	Production—Mining or Non-metallic Processes	Western U.S.	English
GE 38	Geology	35	M	2	Mineral Prop. Evaluation Mine Manag. & Planning	Western USA/Foreign	English
GE 40	Geol. Engr.	43	S	..	Exploration, Engineering or Research Geologist	Western U.S.A. or Foreign	English
GP 15	Geophysics	49	M	3	Petroleum Expl.	Rocky Mountains	English
GP 17	Geophysics	34	M	1	Geophysics	Colorado	English
GP 18	Geophysics	23	S	0	No Mgmt. Trainee	Rocky Mountain	English
GP 19	Professional Engineer	24	M	0	Mineral Exploration	Southwest U. S. or South America	English
GP 21	Geophysical Engineering	39	M	3	Dynamics & Acoustics	U.S.A.	English
PE 15	Petroleum	24	S	0	Reservoir Engr.	Rocky Mtn. Region	English
PE 16	Pet. Eng.	27	M	2	Prod. Engr.	Rocky Mtn., Canada or Alaska	English
PE 17	Pet. Eng.	34	M	4	Pet. Engr.	Open	English
PH 02	Physics	23	S	0	Engineering Physics	Rocky Mtn. Region	English
PH 04	Engr. Physics	27	M	0	R. & D. Engr. Marine Engr.	Coastal except N.E.	English
PR 11	Masters in P.R.E.	30	M	2	Management Systems	U.S.A.	English
PR 12	Chem./Ptrlm. Refining	22	S	0	Chemical-Petroleum Refining Industry	Open	English/French
PR 14	Petroleum Refin. Engineer	39	M	5	Petroleum Refining or Chemical Engineering	Rocky Mountain	English

Address Changes

1920-1939

Philip Doerr, '27, Apartado Postal No. 437, Torreon, Coahuila, Mexico.
H. A. Dumont, '29, 1300 Avalon, Apt. D, El Paso, Tex. 79923.
Robert W. Price, '35, 2358 So. Camino Seco, Tucson, Ariz. 85710.
Jack McK. Pardee, '36, 525 Carlisle Blvd. S.E., Albuquerque, N. M. 87106.

1940-1959

Jack Chelius, '42, 131 S. Upham Court, Lakewood, Colo. 80226.
J. R. Gilbert, '42, P.O. Box 185, Colorado City, Colo. 81004.
Eugene F. Klein, '43, 7240 La Canada Drive, Tucson, Ariz. 85704.
Walter P. Gillingham, '47, P.O. Box 708, San Manuel, Ariz. 85631.
Lee C. Travis, '48, 889 E. 3 Fountain, #218, Murray, Utah 84107.
George E. Hulpia, '49, 302 Forest Lake Drive, Seabrook, Tex. 77586.
Eugene C. McMahan, '49, % Shell Canada Ltd., Off Shore Div., P.O. Box 880, Calgary, Alta., Canada.
William Walter Scott, '49, 244 Vanetia Drive, Long Beach, Calif. 90803.
Dr. Robert D. Sloan, '49, Sloan Research Industries, Inc., 2030 Alameda Padre Serra, Santa Barbara, Calif. 93103.
Russell L. Wood, '49, 3838 Lincoln Parkway West, Allentown, Pa. 18104.
Wendell Scott, '50, 14527 Carolcrest St., Houston, Tex. 77024.
Mark J. Walch, '51, 137 Monadnock Road, Chestnut Hill, Mass. 02187.
George L. Freeland, '53, 365 Harbor Ct., Key Biscayne, Fla. 33149.
Alan R. Jager, '53, % Humble, 130 Linden St., Reno, Nev. 89502.
Earl J. Ostling, '54, 7011 Wolff, Westminster, Colo. 80030.
R. L. Sullivan, '54, Shell Chem., P.O. Box 2633, Deer Park, Tex. 77536.
Willard T. Danker, '55, Ave. Baron d'Huart, Kraainew 1950, Belgium.

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Major W. Seery, '56, 20820 Exhibit Ct., Woodland Hills, Calif. 91364.
Warren W. Hildebrandt, '59, 3561 Rue Mignon, New Orleans, La. 70114.
C. Ogden Smith, '59, 7317 Heathermore Dr., Dallas, Tex. 75240.

1960-1970

Albert L. Dugger, '60, P.O. Box 13631, Ft. Worth, Tex. 76118.
Richard J. Pliny, '60, 200 Montecito Ave., Apt. 403, Oakland, Calif. 94610.
Kent D. Pothast, '60, 2016 N. Court, Ottumwa, Iowa 52501.
David M. Ropchan, '60, 1130-10th St., #203, Golden, Colo. 80401.
Robert Crumb, '61, P.O. Box 2027, Ponca City, Okla. 74601.
Junji J. Inouye, '61, 4104-C Mt. Alifan Pl., San Diego, Calif. 92111.
Douglas R. Shearer, '61, P.O. Box 154, Breckenridge, Colo. 80424.
Ralph A. Wiggins, '61, 25 Bedford Rd., Apt. 707, Toronto 180, Ont., Canada.
Joe R. Wright, Jr., '61, 500 E. 77th, Apt. #2225, New York, N.Y. 10026.
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Frank Nolan Nesbit, '63, 4335 E. Durham Circle, Stone Mountain, Ga. 30083.
Richard D. Crippin, '64, 10528 Swallow Lane, Dallas, Tex. 75218.
Robert N. Cruzan, '66, 512 Liberty, Apt. #4, El Cerrito, Calif. 94530.
Richard E. Hagne, '66, 4905 Del Ray Ave., Washington, D.C. 20014.
Frank Van Dok, '66, 12125 W. Ohio Place, Lakewood, Colo. 80225.
Wayne D. Pickertill, '67, 317 S. Orchard, Boise, Ida. 83705.
Joseph D. Stewart, Jr., '67, 420 S. 21 St., Apt. 31, Hopewell, Va. 23861.
Paul G. Hansen, '68, 355 South Flower, Anchorage, Alaska 99504.
Dr. Nilendu S. Mukherjee, '68, 2202 Cheyenne, Golden, Colo. 80401.
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Charles W. Barksdale, '70, The Barlow School, America, N.Y. 12501.
Bernard W. Distel, '70, #47 Prospector Village, Golden, Colo. 80401.
Richard D. Dolecek, '70, 911 Scranton, Aurora, Colo. 80010.
Stephen R. Douglass, '70, 4616 Matador, Amarillo, Tex. 79109.
James T. Duncan, '70, 4518 Lawnview Dr., Pittsburgh, Pa. 15227.
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Thomas C. Francis, '70, P.O. Box 154, Wilsonville, Neb. 69046.
Walter B. Freeman, '70, P.O. Box 344, Cave Junction, Ore. 97523.
Bruce A. Fry, '70, 69 Ashland Road, Summit, N.J. 07901.
Craig L. Garrett, '70, 1518 Washington, Golden, Colo. 80401.
Steve Peter Gauss, '70, P.O. Box 132, Cascade, Colo. 80309.
Ronald L. Gist, '70, 13583 W. 24th Pl., Golden, Colo. 80401.
Jay L. Godley, '70, P.O. Box 627, Castle Rock, Colo. 80104.
Vaughn S. Goebel, '70, 5404 W. Mt. View Dr., Las Vegas, Nev. 89102.
Richard Griffin, Jr., '70, 5710 W. 38th Ave., Denver, Colo. 80212.
William H. Gumma, '70, 1024 W. Orman, Pueblo, Colo. 81005.
Michael T. Hagan, '70, 2465 So. Newberry Ct., Denver, Colo. 80222.
Raymond Hagen, Jr., '70, 1430 So. Ivy Way, Denver, Colo. 80222.
Bartlett Jay Hanford, '70, 224 El Cerrito, Bakersfield, Calif. 93305.
H. Michael Hartmann, '70, 861 Normandy South, Salem, Ore. 97302.
James A. Hodson, '70, 2212 Ford St., #18, Golden, Colo. 80401.
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Thomas C. Johnson, '70, 1107 N. Locust, Canby, Ore. 97013.
Edward C. Karg, Jr., '70, 5019 St. Paul St., Denver, Colo. 80216.
Robert D. Karsten, '70, 7142 Kalamath St., Denver, Colo. 80221.
Richard J. Kehlmeier, '70, 17190 S. Golden Rd., #18, Golden, Colo. 80401.
Jerry L. Kelly, '70, 389 D Avenue, Limon, Colo. 80823.
Richard A. Kesler, '70, 11285 Montana Ave., Los Angeles, Calif. 90049.
Robert D. Knecht, '70, 7462 W. Cedar Circle, Lakewood, Colo. 80226.
Roy Stephen Koogler, '70, 6525 W. 64th Pl., Wheat Ridge, Colo. 80033.
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Book Reviews

ASTM Directory

A revised edition of the ASTM Directory of Testing Laboratories is now in preparation by the American Society for Testing and Materials. It is intended that the new directory will include all known laboratories that undertake testing on materials and commodities on a fee basis. Directors of such laboratories that are not already listed in the directory and wish to be included at no charge in the 1971 edition should request a free entry form and instruction data by contacting S. F. Etris, ASTM, 1916 Race St., Philadelphia, Pa. 19103.

Reference Source for New Lunar Science

"Proceedings of the Apollo 11 Lunar Science Conference," a three volume set containing the only comprehensive review of the examination by scientists of the "moon rocks" brought back from the Sea of Tranquility by Astronauts Aldrin, Armstrong and Collins, has been released by Pergamon Press, Inc., of Elmsford, New York 10523, publishers of scientific books and international journals. (Price \$40.00.)

The volumes feature over 500 half-tones and 16 color plates of the lunar samples, highlighting details of the rock textures, glass spherules and soil samples found on the moon. During the three month exhaustive examination of the lunar rocks, scientists utilized the latest research methods, including electron microprobe and high voltage electron microscopy. The 150 principal investigators have contributed 180 articles to the 2,491 page report published as Supplement 1 of Geochimica et Cosmochimica Acta (Vol. 34), official journal of The Geochemical Society and The Meteoritical Society.

The work contains an unabridged record of the first laboratory investigation of lunar samples reported on at a conference held under the sponsorship of NASA on Jan. 5-8, 1970, in Houston, Texas.

The set, edited by Prof. A. A. Levinson of the University of Calgary, Canada, is divided into three volumes: "Mineralogy and Petrology," "Chemical Isotope Analyses" and "Physical Properties."

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Gold Hill Area

The Gold Hill area, in Tooele County, northwest Utah, is one of the oldest mining sites in the state. Principal minerals removed since 1857 are lead, copper, silver, gold, arsenic, zinc and tungsten.

This area lies in the east central part of the Great Basin section of the Basin and Range Province. The sediments, severely thrust, comprise a relatively complete stratigraphic sequence from Lower Cambrian through Lower Triassic. They have been intruded by a quartz monzonite stock and porphyry dikes, and include acidic lavas and pyroclastics of Tertiary age.

Evaluation of the potential for the districts shows that, based on current information, most of these minerals are present in quantities too small for large scale commercial exploitation. This area contains impressive quantities of beryllium; the writers postulate that the beryllium is in feldspar.

Mineralization in the Gold Hill Mining District, Tooele County, Utah, by H. M. El-Shatoury, Atomic Energy Establishment, United Arab Republic—Cairo.

J. A. Whelan, Prof. of Mineralogy, Univ. of Utah, Research Geologist, Utah Geol. and Mineralogical Survey, Bulletin No. 83—Utah Geol. & Min. Survey.

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Letters

The following excerpt from a letter written by Bob Gayer, E.M. 1941, to his friend and classmate, Fred B. Hynes, E.M. 1941, humorously describes a new fishing technique which is not recommended for general use:

"I was just re-reading the 'Coral demolition instructions' and was reminded of a Herring fishing expedition I fostered, using C.I.L. Wobblers as 'Lures'? This occurred in a small bay near the north of Jarvis Inlet, just north of Vancouver. Every evening herring would enter the bay in large schools and we would jig for them with a weighted string of bare hooks. This was fine, but not really productive as we wanted a hundred pounds or so to salt and smoke at our summer camp.

"There were some electric blasting caps and a half cake of 40% left over in my cabin from an abortive prospecting trip the summer before, so I decided to see how dynamite would work. Our depth sounder in the cruiser indicated the herring were 'balled up' a few feet off the bottom and about three fathoms below the surface.

"We rigged our bomb, put a small weight on it and a float that was carefully calculated to cause the 'bomb' to float in the center of the schooling area. We intended to lower this in a favorite spot, then pay out some blasting cable until we were far enough away and then sit quietly for a few minutes to permit the herring to gather again in their favorite spot. Then wham, the bay would be full of fish! We did all this, but the night was cold and we required a certain amount of liquid refreshment to ward off pneumonia, etc.; also I

G. C. Weaver, '26

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could not locate any light blasting wire so unreeled a few hundred feet of insulated single strand #12 copper wire instead. Unfortunately we stripped it off the end of the coil creating a beautiful coil spring with just enough gentle tension to draw the small skift back almost directly behind us; the charge if I remember, was five sticks. Well, when the time seemed ripe, I touched the wires to the battery and created the greatest shower bath in history of tons of salt water, chunks of herring and some excrement from a couple of scared experts. We figured out later what had happened, and we did collect a lot of herring, but never felt any desire to repeat the project."

Aug. 6, 1970

Dear Carter:

I've been transferred from Caracas, Venezuela, to Celle, Germany, for two years, as staff geologist on a special assignment. Please change my address on the magazine to W. L. Burnham, Mobil Oil A.G., Postfach 110, 3100 Celle (20A), Germany. You also might note this change in the magazine. Regards to Colonel Fertig.

Thanks,
Bill Burnham, Geol.E. '41

A graduate of the class of 1965 who made captain, U. S. Army, prior to his return to civilian life was an outstanding helicopter instructor. A paragraph of his letter is interesting:

"In a way it is ironic, that I, who had a devil of a time in certain subjects at C.S.M. (Please don't research the records — you'll split a seam laughing!) should end up as an instructor, as teaching was the last thing I dreamed of while attending Mines. It just goes to show you about the plans of mice and men. Best of all tho, is the fact that I am enjoying my experience as a teacher of others."

Sept. 15, 1970
1609 Esther Dr.
Bakersfield, Calif.

Dear Sir:

My wife and I enjoyed the article in the August 1970 issue of the *Mines Magazine* on Paul H. Keating. I entered Mines in 1962 and, therefore, missed Prof. Keating. My father, cousin, Gary Bennett, and many friends, however, did have courses with him and often recalled to me many things about him.

It would seem to us that Prof. Keating is more than just colorful. He represents a past era of Mines and engineering that should not be lost. I would, therefore, like to suggest that Mr. Galbraith and/or other intimate friends of Prof. Keating compose a biography of his life to be published by the school. It would further seem obvious that the lives of other Mines associated men, i.e., Dr. LeRoy, Prof.

Barb, etc., would make both interesting reading and be quite inspirational and educational.

Library walls are lined with the lives of great doctors, writers, clergy, lawyers, etc., but damn few engineers. We feel Mines could again render our profession a great service by immortalizing our outstanding engineers.

In closing let me remark that we as a family enjoy reading the *Mines Magazine* and have for two generations.

Very truly yours,
Walt Pearson, P.E. '66, M.Sc. '68

Sept. 14, 1970
Perth, W. A.

Dear Col. Fertig:

Thanks for your card. Linda, Evan and I have arrived on overseas contract with Kaiser Engineers in Perth, W. A. After Oct. 1st we'll be settled into our rented house which has lots of room for visitors, so should anyone from Mines be in W. A. we'll expect a call.

I've been working in Perth most of the time since the first of the year, and it is mighty good to have our little family together again. Evan will be one year old on Oct. 1 and will undoubtedly be a full fledged little Aussie by the time he gets home again.

Kaiser Engineers has three large project offices in Australia and our "minerals" group in Oakland is swamped with work elsewhere—ask Jim Thompson about that. Here in Perth we devote our efforts to keeping up with Hamersley Iron Pty. Ltd.'s passion for expansion. At the moment, we're building a 20 million ton per year bulk shipping port on East Intercourse Island, we have started engineering for a "Hilmet" plant. A metallized agglomerate of lump ore using the SL/RN process—one of several for direct reduction. This is the project with which I am associated. Finally KECL is studying and planning the upgrading of Hamersley's R.R. to haul 70 million tons per year.

Our home address will be 8 Donegal in Floreat Park, W. A.

I have been approached by the parents of a promising young geophysicist presently working for Western Mining in the W. A. nickel fields. He is particularly interested in doing graduate work in G.P. and has his eye on the Royal School of Mines in London; however, I told his folks that Mines, among other U.S. institutions, was outstanding in the field and deserved consideration. Would you please send me information about graduate studies in geophysics at Mines and I'll put Mr. Stewart in touch with the department.

I'd also appreciate a current alumni directory here. Who knows, there may be good cause for a party!

Best regards,
Dick Pitney, E.M. 1960

Alumni Headliners

Warfield Promoted by Caterpillar To Quality Assurance Manager

JAMES M. WARFIELD, Met-E. 1951, will become quality assurance manager at Caterpillar's East Peoria plant.

Warfield graduated from Colorado School of Mines and joined Caterpillar in 1951 as a metallurgical engineer. Following a number of positions in inspection, he went to San Leandro, Calif., in 1964 as quality control manager.

Kellenbenz Sales Representative For Jefferson Chemical Company

R. P. KELLENBENZ, P.R.E. 1958, has been appointed sales representative, Houston District, for Jefferson Chemical Co., Inc. He will report to Mr. J. C. Dingman, Houston district manager.

Mr. Kellenbenz has had previous assignments with Jefferson in market research and international operations. He holds a Petroleum Refining Engineering degree from Colorado School of Mines and an M.B.A. degree in economic finance from the University of Houston.

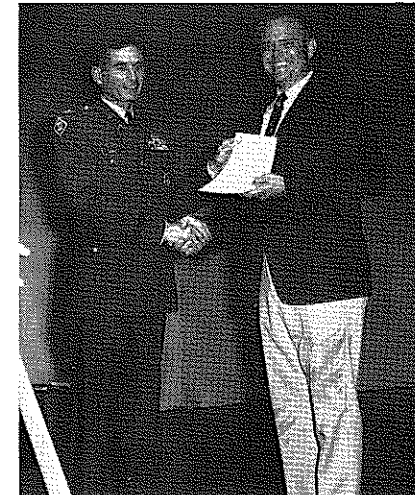
A. J. Mancini Assistant Director Of Wyo. Water Planning Program

ANTHONY J. MANCINI, Geol.E. 1955, has been appointed assistant director of the Wyoming Water Planning Program. Mr. Mancini is filling the position vacated by the death of Dan Simmons last June. One of his primary responsibilities will be to reestablish staff capability in the area of ground water inventory and related water use. The Assistant Director will coordinate the staff effort in preparing Water Planning reports for publication, as well as analyze the potential for the development of Wyoming's groundwater resources.

Mr. Mancini comes to Cheyenne from Helena, Mont., where he had been a member of the staff of the Montana Water Resources Board for three and one-half years, first as staff geologist and groundwater supervisor, later as director of the Water Resources Division.

The new Assistant Director has 15 years' experience as a professional geologist, five of which were gained as a consulting petroleum geologist. He graduated from the Colorado School of Mines in 1955 as a Geological Engineer and is a Certified Professional Geologist.

He and his wife, Sally, have three children, Kris 19, Skip 14, and Leslie 11.



JOHN A. CHRISTIANS, P.E. 1958, was one of several personnel at the U. S. Army Mobility Equipment Research and Development Center, Fort Belvoir, Va., receiving official commendation for their achievement in earning a degree under the Army's education program. He is shown here with Colonel Bennett L. Lewis, Commanding Officer, who presented him with a letter of commendation for his achievement in earning a Master's in Engineering Administration at George Washington University.

Wicks Smelter Superintendent For Blackwell Zinc Co., Inc.

FRANKLIN D. WICKS, Met.E. 1953, has been promoted to the position of smelter superintendent at Blackwell Zinc Co., Inc., an operating unit of the AMAX Base Metals Group and a subsidiary of American Metal Climax, Inc.

Blackwell Zinc operates a smelter in Oklahoma which last year produced 90,000 tons of slab zinc.

Mr. Wicks joined AMAX in 1961 at the Carteret, N. J., copper refinery. He was manager of new product development at the time of his transfer to Blackwell in 1968 as metallurgical superintendent. He holds a degree in Metallurgical Engineering from the Colorado School of Mines.

Doran Research Economist At D.U. Research Institute

RICHARD K. DORAN, Met.E. 1964, has been appointed research economist in the Industrial Economics Division, University of Denver Research Institute. He will assist in metal and mineral studies which require both technical and economic approaches.

Mr. Doran received his Metallurgical Engineering degree from the Colorado School of Mines and his M.S. in Mineral Economics from Pennsylvania State University. He served in the U.S. Army as project engineer at the Frankford Arsenal in Philadelphia. While there he did research on the degradation and environmental effects of metals.

Campbell Republican Candidate For Congressional Seat in Okla.

TERRY L. CAMPBELL, E.M. 1964, has jumped into Oklahoma's Fifth District congressional race against incumbent Representative John Jarman (Dem.)

The young Republican Vietnam veteran, who quit a junior executive position with Kerr-McGee Corp., to run for office, served a year as an officer in Vietnam. He said he saw long ago that the Cambodian action was necessary.

"The time has come," he said at a recent press conference, "When positive action must be taken to influence and shape the course of events which will directly affect the lives of all Americans and in particular, the lives of those of us who reside in the Fifth District."

He said he saw the threat posed by Russia's increased nuclear power as being of special concern.

"A congressman of the 70's must understand our present nuclear strategy and the need for strong defense. This is vital if we are not to be nuclear blackmailed by the Communist world."

He also called for action to halt crime and violence.

"There are radical minorities in our society," he said, "who seek to destroy the framework of our democracy. Under perverted ideas of freedom and individual rights they riot, assault and threaten law enforcement officers, destroy and deface private and public property, burn and defile our flag, and disrupt public ceremonies.

"In short, they openly advocate treason and anarchy. When public officials attempt to restore law and order, these radicals cry brutality and repression by the majority."

Campbell said he believed Congress should investigate to find out who is supporting campus radicals financially. He advocated that federal scholarship aid be withheld from student radicals.

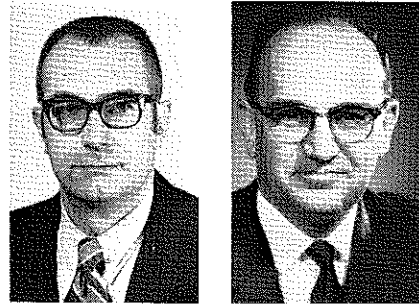
The candidate said he believed because of his background he would be well suited to represent the district, an oil industry center.

"It has been said that America is playing environmental roulette.

"Pollution and its adverse effects on the quality of our environment will affect us here in Oklahoma in the decade ahead if the proper courses of action are not carried out.

"As we reap the rewards of industrial growth in Oklahoma, we must also recognize the implications of such growth on our ecology."

Campbell is a member of Memorial Christian Church, Oklahoma City Chapter of the Society of Petroleum Engineers, and the Oklahoma City Junior Chamber of Commerce.



Spielman

Donohoo

Spielman Appointed Manager Western Operating Division Pittsburgh and Midland Coal

CHARLES O. SPIELMAN, Geol.E. 1955, has been appointed manager of Pittsburgh & Midway Coal Mining Co.'s Western Operating Division and will headquarter in Denver, Colo. His responsibilities will include the operation of the Edna Mine located near Oak Creek, Colo.; the McKinley Mine at Gallup, N. M., and exploration and development in the West. Following his graduation from the Colorado School of Mines in 1955, he was employed by the Utah Construction and Mining Co. as an engineer on exploration and development assignments in the United States and Australia. In 1969, Mr. Spielman joined the Gulf Mineral Resources Co. in Denver, as a senior mining engineer with the responsibility for coal engineering and development in the Western United States. In such capacity, he has been working as a consultant with Pittsburgh & Midway but as a result of his new position, he will be transferred to the coal company.

Mr. Spielman and family reside in Littleton, Colo.

Lt. W.E. Miller Stationed At Mountain Home AFB

LT. WILLIAM E. MILLER, P.E. 1965, son of Mr. and Mrs. Roy J. Miller of 5195 W. 14th Ave., Denver, has arrived for duty at Mountain Home AFB, Idaho.

Lieutenant Miller is a fuels management officer with a unit of the Tactical Air Command which provides combat units for air support of U.S. ground forces.

The lieutenant, who previously served at Lajes Field, Azores, is a 1961 graduate of North Denver High School. He received his Petroleum Engineering degree in 1965 from Colorado School of Mines and was commissioned in 1967 upon completion of Officer Training School at Lackland AFB, Tex.

His wife, Bettye, is the daughter of Mr. and Mrs. Robert Norris of 8311 Winkler Drive, Houston.

If you want to make somebody believe something, whisper it.

Donohoo Will Direct TGS's New Agricultural Division

H. V. W. DONOHO, Geol.E. 1939, Medalist 1968, a vice president of Texas Gulf Sulphur Co. in charge of the potash division, has been named vice president of a new agricultural division with headquarters in Raleigh, N. C. The announcement was made by Dr. Charles F. Fogarty, E.M. 1942, D.Sc. 1952 and Medalist 1968, president of Texas Gulf Sulphur.

The company said it has long been its plan to merge all fertilizer materials operations, including production and sales into one division. Effective Aug. 15, the phosphate and potash divisions were combined to form the new agricultural division.

The company earlier this year established worldwide sales headquarters for phosphate and potash in Raleigh.

Mr. Donohoo has been general manager of the potash division since July 1966. He joined the company in 1957 as assistant manager of the exploration department and worked primarily in Cuba and Canada. In 1961 he was transferred to Houston, Tex., as manager of exploration with responsibility for all exploration activity in the Gulf Coast area. He was the company's chief geophysicist until his assignment with the potash division.

Following his graduation in 1939 from the Colorado School of Mines, he worked for Phillips Petroleum Co. and the Stanolind Oil and Gas Co. in the Gulf Coast.

He was an instructor at Cornell University from 1941 to 1943 and served with the U. S. Navy as an electronics officer in both World War II and the Korean War, rising to lieutenant commander.

Following graduate work at the Colorado School of Mines and Columbia University, he became an assistant professor at the University of Utah, where he organized the department of geophysics.

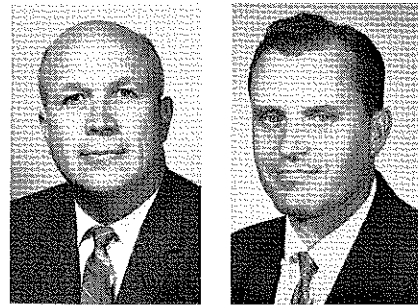
He was with the exploration staff of the U. S. Steel Corp. for five years before joining TGS.

In June 1968 the Colorado School of Mines awarded Mr. Donohoo its silver Distinguished Achievement Medal, the highest honor the university can confer upon an alumnus. The medal, which has the stature of an honorary degree, was awarded at the 94th commencement of the school in Golden.

A native of Des Moines, Iowa, Mr. Donohoo will establish residence in the Raleigh area. He and his wife, Norma, have two sons.

"I'm sorry you didn't like my new short skirt, Grandma," said the coed. "But when you were a girl didn't you have to set your cap for the right man?"

"Not my knee cap," snorted Grandma.



Knight

Patterson

Knight Elected V-P Operations Pittsburgh and Midway Coal Co.

HERMAN E. KNIGHT, E.M. 1949, was elected vice president—operations for The Pittsburgh & Midway Coal Mining Co. Mr. Knight, formerly vice president—engineering, will be responsible for both engineering and operations.

A graduate of the Colorado School of Mines with a degree in Mining Engineering, Mr. Knight has more than 30 years of experience in the mining industry. Prior to becoming associated with Pittsburgh & Midway in 1964, he was division manager of the Island Creek Coal Co., West Kentucky Division. He is a Registered Professional Engineer in Kentucky, Missouri, Kansas and New Mexico and a member of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Mr. Knight will continue to be headquartered in Pittsburgh & Midway offices in Kansas City.

At the same time, Mr. Zagnoli announced the establishment of an Eastern, Central and Western Operating Division and the appointment of a manager for each division. Mr. Carl L. Sarnato will be manager of the Eastern Division and Mr. Charles O. Spielman will be manager of the Western Division.

Patterson Earns Promotion At Inland Steel Plant

EVERETT M. PATTERSON, JR., Met. E. 1951, 4805 White Oak Ave., East Chicago, Ind., formerly assistant superintendent of No. 2 cold strip mill at Inland Steel's Indiana Harbor Works, has been promoted to assistant superintendent of the Plant's 76" hot strip mill.

Patterson was born in Jersey City, N. J., but earned his metallurgical Engineering degree at Colorado School of Mines. He began at Inland in 1951 as a metallurgist trainee and went to his current job in 1963.

An Idaho potato married a Long Island potato. Pretty soon they had a little sweet potato, and when the little sweet potato grew up it said: "I want to marry that radio announcer."

Said Mama: "You can't marry him. He's a commentator."

In Memoriam



Charles T. Baroch

Charles T. Baroch

CHARLES T. BAROCH, E.M. 1923, died in Arlington, Va., Aug. 8. Interment was at Lynchburg, Va.

Although born in Chicago, May 18, 1901, Charles considered Colorado his home. He was raised on a homestead in the eastern part of the state and a ranch in the San Luis Valley. He graduated from North Denver High School in 1919 and received his Mining Engineering degree from the Colorado School of Mines in 1923.

After graduation from Mines, he was employed by several mining and industrial companies throughout the West for 17 years. During this time he did pioneering research on the hydrometallurgy of oxide copper ores for the Bagdad Copper Corp., Hillside, Ariz.

In 1940, he entered service with the U. S. Bureau of Mines at Boulder City, Nev., to participate in the development of research programs on strategic metals. Subsequently he was promoted to superintendent and later to assistant chief of the Boulder City (Nevada) Experiment Station.

Especially noteworthy was his contribution to the development of a process for the preparation of aluminum from potassium alum. He also made major contributions to the development of the commercial process that is used today for the magnesium reduction of titanium tetrachloride to produce ductile titanium metal. As chief of the Titanium Development Section at Boulder City, he guided research and development in the Bureau's first demonstration plant and also acted as a consultant to the

embryo American titanium industry in solving many novel and complex problems connected with the initial commercial production of a new refractory metal.

In 1955 Charles transferred to the Salt Lake City station, where he worked on a cooperative research project with General Service Administration to improve the hydrometallurgical processes to recover nickel and cobalt at a government financed and operated plant at Nicaro, Cuba.

In 1956 he accepted a permanent assignment in Washington, D. C., and the remainder of his career with the Bureau of Mines was spent there. Subsequently he became chief of the Branch of Rare and Precious Metals and was later moved to chief, Branch of Non-Metallic Minerals. He continued in this capacity until 1963, when, because of his broad metallurgical knowledge and experience with rare metals, he was called upon to serve as the Bureau's authority in the field of raw materials for nuclear energy. His knowledge and advice was widely used by officials of the Department of the Interior, other government agencies, and by industry.

Mr. Baroch authored or co-authored five Bureau of Mines publications on aluminum and titanium. He was the co-author of the chapter on Nuclear Energy in the AIME 1959 volume on *Economics of the Mineral Industry*, and he was the principal author of the chapter on nuclear energy in the volume on *Mineral Economics* (1964). In addition he authored six journal articles.

Mr. Baroch retired from the Bureau of Mines Feb. 28, 1969. In July of that year he was granted the Meritorious Service Award of the Department of the Interior in recognition of 28 years of superior service with the Bureau of Mines.

He became a member of AIME in 1948. He was active in the District of Columbia Section of the Colorado School of Mines Alumni Association which he served as secretary, vice president and president. He was in his second round of service to the group as secretary when he passed away.

Survivors include his wife, Antoinette (Toni), Arlington, Va.; two sons, Charles F. (Met.E. 1954), Lynchburg, Va., and Edmund F., (Met.E., Univ. of Nevada 1955); a daughter, Mary Anne Bement, wife of A. L. Bement (Met.E. 1954), Boston, Mass.; a brother, George F., Phoenix, Ariz., and 15 grandchildren.

The family suggests expression of sympathy in the form of contributions to the American Cancer Society.

—Frank L. Wideman, E.M. 1923



Brown

Leroy Taylor Brown

LEROY TAYLOR BROWN, E.M. 1926, died April 21 after a long illness in the hospital at Sharon, Conn. Until his retirement in 1956, most of his career as a mining engineer was spent in Latin American countries. In 1924 he won a silver medal on the Olympic Team for high jumping, and for many years he held the world indoor record for high jumping.

Born Jan. 25, 1902 in New York City, Mr. Brown graduated in 1919 from Stuyvesant High School and in 1923 received a B.S. degree in Physics from Dartmouth College. He entered the Colorado School of Mines in 1923 and three years later (1926) earned his E.M. degree.

Except for a two-year period (1932-34) when he was employed as a safety director in the state of New York, Mr. Brown's career from 1926 to 1942 was spent as a mine superintendent or general manager in Peru, Venezuela and Cuba usually in the employ of Cerro de Pasco Corp. or American Metal Co. From 1942 to 1944 he was assistant manager, Amco Magnesium Corp., Wingdale, N. Y.; 1944-1949, manager of the Torreon Smelter, Cia Minera de Penoles, Monterrey, Mexico; 1949-1951, general superintendent, Loomis Talc Corp., Gouverneur, N. Y. After a number of years as a consulting engineer in New York, Mr. Brown was employed as an engineer in Venezuela, returning to California in 1962 where he did consulting work (asbestos).

Mr. Brown is survived by his widow, Elizabeth Meyer Brown of Sharon; two sons, Leroy Taylor Brown Jr. of Mexico City and John Carroll Brown of Burlington, Vt.; one sister, Mrs. Henrietta Mitchell of Tucson, Ariz., and four grandchildren.

Milton M. Levy

MILTON M. LEVY, E.M. 1916, has been reported to us as having died but there is no record as to date of his death.

Mr. Levy had been living in Los Angeles, Calif., and at one time was employed by the Deese Date Co. at Indo, Calif.

Gerald H. Parkinson

GERALD HOY PARKINSON, E.M. 1925, the general manager of Rhodesia and African Chrome Mines until his retirement a few years ago, died Sept. 13 at his home, Daybreak Farm, Somabula. He was 68.

Mr. Parkinson was born in Illinois, and came to Rhodesia 41 years ago. He was with the chrome mines for 25 years and retired at the end of 1966 to his farm.

Since then he had been chairman and a director of Sable Chemicals, Que Que; a commissioner of the Electricity Supply Commission; a director of the Matabeleland Farmers' Co-Op; director and consultant for Rhodesia Chrome Mines; chairman of Union Carbide, Rhomet Que Que.

In the past he played a prominent role in the National Industrial Council for the mining industry and was a past chairman of the Chamber of Mines, a member of the old Rhodesia Railways board, and served as group chairman of the Gwelo Intensive Conservation Area committees.

In 1935 Mr. Parkinson married Miss Margaret Futter of Somabula, and is survived by his widow, one daughter, Mrs. Hazel Quinn, and a granddaughter Colleen.

John Russell Chambers

JOHN RUSSELL CHAMBERS, E.M. 1940, died Aug. 14, 1969 in Lutheran Hospital. Services were held in the Chapel of the Angel with entombment in the Tower of Memories.

Born in Boulder, Mr. Chambers moved to Denver with his family from Sunset, Colo. in 1913. He was educated at Golden High School and earned his Mining Engineering degree in 1940 at the Colorado School of Mines. For the next 27 years he was engaged in Civil Engineering in the Denver area. He was married to the former Jessie Izett on Dec. 25, 1938, in Fort Worth, Tex.

A Mason, Mr. Chambers was Past Commander of Denver Commandery No. 25, Knights Templar, Past Master of Temple Lodge No. 84, and a member of El Jebel Shrine.

Surviving in addition to his widow are two daughters: Mrs. Ann H. Javernick of San Jose, Calif. and Mrs. Alice C. Deaton of Lakewood, Colo.; a son, Russell S. Chambers of Kirkland, Wash.; a sister, Helen C. Robinson, of Lakewood; a brother, Wayne E. Chambers of Pittsburgh, Pa., and four grandchildren.

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Class Notes

1926

Arch F. Boyd, E.M. 1926, retired from the Atomic Energy Commission Field office in Grand Junction in July, 1970. Arch was honored by a farewell party given by his fellow employees at AEC. This is a second retirement for Arch after having a distinguished career in copper mining. Arch and his grandson, David, from Eagle Mountain, Calif. were in our office in mid-August.—WWF.

1932

Arthur B. Austin, E.M. 1932, took early retirement from Hercules, Inc. on April 1 and moved back to Joplin, Mo. about the middle of June 1970. He writes: "Having lived in Joplin for many years and liking the mid-West seemed reason enough to re-establish here. If I can be of any help in this general area let me know. Arthur's address is: 2220 Carolina, Joplin, Mo. 64801.

1938

Louis E. Bremkamp, E.M. 1938, has returned to the Philippines for a short period. The Bremkamps expect to be at their home in Hot Springs National Park after Dec. 1, 1970. Their address at that time will be 312 Baffinwood Dr., Hot Springs National Park, Ark. 71901.

1942

John B. Botelho, E.M. 1942, has resigned from Benguet Consolidated, Inc. to become mining consultant for Santa Ines Steel Corp. He will also

Hugo Riecken

HUGO RIECKEN, P.E. 1928, died May 27 at his home in Denver (522 S. Race).

Born Sept. 4, 1901 in Colorado Springs, Colo., Mr. Riecken attended elementary and secondary schools there. In 1919 he enrolled at the Colorado School of Mines and in 1928 earned a degree in Petroleum Engineering. For a number of years he was employed by oil and gas companies in Seminole, Okla. He was for a time assistant superintendent of Skelly Oil Co.'s natural gasoline plant at Seminole. In the early 1930s he joined Phillips Petroleum Co., Bartlesville, Okla., where he served for many years in the company's Industrial Relations Department.

Mr. Riecken is survived by a son, Robert J. Riecken of Lakewood, Colo.

Elmer R. Wilfley, '14

Wilfley Centrifugal Pumps

Denver, Colorado

be doing consulting work on a fee basis. His address is: 9th Floor PLDT Bldg., Legaspi St., Makati, Rizal, Philippines.

1948

Walter J. Heap, P.R.E. 1948, has recently accepted employment as a project engineer with the J. F. Pritchard Co. of Kansas City, Mo. The company address is: 46 W. Roanoke Parkway, Kansas City, Mo. 64112.

1952

Harry D. Adams, P.E. 1952, has been transferred from Argentina to England, where his new address is: Amoco Europe, Inc., 46-47 Pall Mall, London, S.W.1, England.

1954

Pablo G. Carpo, Met.E. 1954, who has been carried as "Address Unknown" is now living at 22 Scout Madrinan, Quezon City, Philippines. Mrs. Louis Bremkamp met Mrs. Carpo at a luncheon recently in Manila.

1958

James L. Eirls, M.Sc. 1958, manager Manufacturing Planning for Westinghouse Air Brake Co., is being transferred to Belgium. His new address is c/o LW Manufacturing S.A., 48 Chause de Tirlemont, Gembous, Belgium.

Dr. Robert S. Hufstедler, D.Sc. 1958, is one of three division chairmen at Virginia Wesleyan College, a four-year liberal arts college which had its first graduating class in June 1970. In addition to his chairmanship of the Division of Natural Sciences and Mathematics, Dr. Hufstедler is a professor of Chemistry. He has taught at Texas Tech, Colorado School of Mines (where he received his doctorate), and Old Dominion University. He has been a member of the VWC faculty since September 1968.

1960

Kent P. Pothast, E.M. 1960, received his M.B.A. graduate degree June 11, 1970 from Harvard Business School. According to our records, his address is: 2016 North Court, Ottumwa, Iowa 52501.

1964

John M. Galloway, Met.E. 1964, was awarded his M.B.A. graduate degree June 11, 1970 at the 319th Commencement of Harvard University. John's address is: c/o Coca Cola Co., P. O. Box 2079, Houston, Tex. 77001.

1968

Robert A. Reseigh, E.M. 1968, will complete his army tour by the end of the year. During this time he will continue to receive mail at his parents' home at 1000 Balsam, Denver, Colo. 80215.

1970

David R. Alison, E.M. 1970, was one of two men appointed mining engineers by Pittsburgh Coal Co., a division of Consolidation Coal Co. He has been employed as an engineer at the Mathies Mines, also operated by Pittsburgh Coal.

Campus Headlines

Homecoming Oct. 30 and 31

THE 1970 HOMECOMING will be celebrated on Friday, Oct. 30th, and Saturday, Oct. 31st.

At 7:30-12:00 a.m. Alumni Registration at the College Union.

From 8:00 a.m. to 9:00 a.m. the Chuck Wagon Breakfast will be served for Alumni and friends at the Ben H. Parker Memorial Union. This excellent Breakfast offers a chance to meet your friends early in the day and make plans to take part in all the activities. A special table will be reserved for each Honor Class.

10:45 a.m. Homecoming Parade. This event has been moved to this time in order to allow the visitors to

attend the Barbeque and Alumni Reception to be held in the Integral Club at noon. This event is sponsored by the Senior Class as well as the Alumni.

12:00 Noon Barbeque and Alumni Reception. The Barbeque sponsored by the Senior Class and Reception to be held at noon is important because each of you will have an opportunity to meet Dr. Guy T. McBride Jr., the new President of the Colorado School of Mines, at that time.

1:00 p.m. Dedication of Intramural Athletic Field and Parking Lots, a gift of Nils Swenson. This event will be followed by crowning of the Homecoming Queen.

1:30 p.m. Homecoming Football Game, Orediggers vs Western State.

4:30 p.m. Informal reception with coffee and doughnuts will be held in the College Union after the game.

5:00 p.m. Fraternity and Dormitory Open Houses. It is hoped that the many Alumni who are here will attend the fraternity and dormitory

open houses where buffet dinners will be served.

8:30 p.m. Homecoming Dance will be held.

Honor classes will be those who graduated in 1950, 1955, and 1960. Members of these classes will receive notices, and our office will assist you in making arrangements for a dinner or cocktail party on Friday evening preceding the Homecoming Pep Rally.

Former Guerrilla Assigned to Atlanta

Colonel Robert S. Kramer, a former guerrilla during World War II, has been assigned to Atlanta as the Deputy Division Engineer, for the U. S. Army Corps of Engineers' South Atlantic Division. The Colonel reported to Atlanta about Aug. 1.

His decorations include the Legion of Merit, Bronze Star Medal with Oak Leaf Cluster, and many foreign decorations.

SPACE AGE GEOLOGY AT STATE FAIR

THE old prospector with the pick and shovel has been replaced by the space age geologist. This was the theme of the Colorado School of Mines exhibit in the Parade of Progress building at the Colorado State Fair in Pueblo.

Using a new tool, called remote sensing, the modern day prospector, flying in an aircraft from 500 feet to several thousand above the ground, can pin-point features of the terrain,

geology, mineral, metal, and water resources, and many others.

A test of such exploration is now under way, covering 10,000 square miles of south-central Colorado. Called the "Bonanza Project," for a mining district in the area, the project is being conducted by the Geology Department of the Colorado School of Mines with the support of NASA and Martin-Marietta, Denver Division.

The Mines display at the State Fair described the Bonanza Project in de-

tail, showing photos obtained by remote sensing and their interpretations. Areas other than the Bonanza test site also were presented, again with interpretations and descriptive materials.

Attracting many visitors to the Mines exhibit at the State Fair were demonstrations of an infrared radiometer, a device used in remote sensing, and a display featuring a stereoscope, which gives three-dimensional viewing of air photographs. The one used in the display was a striking aerial view of the mountains at Saguache, Colo.

Geology Department students manned the Mines exhibit. The material on remote sensing was prepared for the exhibit by Dr. Robert G. Reeves, principal investigator for the Bonanza Project.

Interested visitors at the Mines exhibit over the weekend included Governor John A. Love and U. S. Senator Gordon Allott.

Remote sensor data is obtained through color, color infrared, and multiband photography; infrared imagery; and radar. Using highly sensitive cameras and instruments, today's geologist may identify and interpret unknown areas without extensive ground checking.

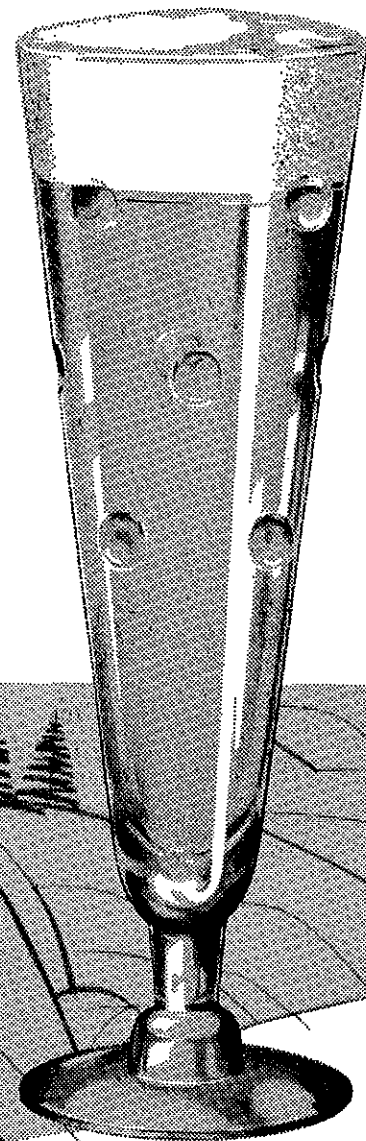
Bonanza hopes to prove the practical usage of remote sensing in mineral exploration, and speed up the discovery of vital minerals, metals, and fuels to feed the demands of Colorado and the nation.

Eventually it is planned that remote sensing can be adapted to earth-orbiting spacecraft such as the proposed Skylab.



MINES STATE FAIR EXHIBIT EXPLAINED.—Art Pansze, left, Colorado School of Mines graduate student in geology, explains an infrared radiometer to two interested visitors to the Mines exhibit at the Colorado State Fair in Pueblo. The geology display features remote sensing through the use of cameras and highly sensitive equipment such as radiometers to locate mineral deposits.

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Technical Societies

Industrial Pollution Seminar Nov. 9-11

L. P. Gowman, marketing director, Environmental Sciences, Inc., Pittsburgh, has announced plans for the first in-depth working seminar on pollution which will be held Nov. 9, 10 and 11 in Pittsburgh.

The seminar, entitled "For Land's Sake," will cover a wide range of pollution and its inherent problems to various manufacturing industries. Prominent speakers familiar with air, water, and land pollution problems and their consequences will discuss legislative trends, codes, air and water sampling techniques, and equipment applications on the information filled agenda.

Essentially, ESI provides land and water surveys, air and water pollution monitoring, identification of pollutants, detailing of specific causes of pollution, establishment of air and water standards within geographic or industrial boundaries, and recommendations for specific anti-pollutant equipment and solid waste treatment, analysis and correction.

ESI becomes involved in research and development to a large degree. An analytical laboratory, state certified, and fully equipped with environmental technological hardware, it is staffed with some of the most prominent engineers and scientists in the country.

Mr. Gowman emphasized, "This is not a 'How To' seminar. Rather, our speakers and attendees will discuss, in detail, industrial emissions in air and water, particulate matter, the causes and effects of SO₂, sludge problems, thermal pollution and its effects, plant site selection, and the economics of pollution control.

"Since we are not an equipment manufacturer, the seminar will remain objective in the analysis of equipment application to specific problems. By the way, we are looking forward to a spirited discussion on solid wastes disposal and its treatment which is a real vital issue in most every community today."

The seminar three-day fee is \$200 and reservations are limited.

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AMC Convention Session Outlines Impact of Mining Activities on Environment

Ladies attending the American Mining Congress' 1970 Mining Convention in Denver Sept. 27-30, heard firsthand reports from experts on how the growing public concern for the environment affects themselves, their families, and the mining industry. And one of the experts was a woman.

J. Allen Overton, Jr., AMC executive vice president, said the "innovative" session for the ladies was included in the convention program "to portray the mining industry's own deep concern for the environment in meaningful terms."

Lawrason Riggs III, of New York, president and chief executive of St. Joe Minerals Corp., presided over the session in which Dr. J. D. Forrester, of Tucson, Ariz., director of the Division of Environmental Engineering and Research, Phelps Dodge Corp., discussed future mineral needs in relation to supplies and ecological considerations. Forrester was dean of the College of Mines at the University of Arizona and director of the Arizona Bureau of Mines until last July when he was named to head the new Phelps Dodge unit.

Representing the distaff side was Dr. Beatrice E. Willard of Boulder, Colo., executive director of the Thorne Ecological Foundation, who discussed the conditions under which the mining industry will be operating in the future. A 1947 graduate of Stanford University, she received advanced degrees in botany from the University of Colorado. Dr. Willard has been an environmental consultant to the Omaha District of the U. S. Army Corps of Engineers, the Rocky Mountain Center on Environment, and the White Clouds project of American Smelting and Refining Co. A noted writer and lecturer, she was honored in 1969 by the Colorado Wildlife Federation as the state's Conservationist of the Year.

Discussing the impact of mining activities on air and water quality was Ian K. MacGregor of New York, chairman and chief executive officer of American Metal Climax, Inc. Born and educated in Scotland, he holds degrees in metallurgy from Univ. of Glasgow and Univ. of Strathclyde.

Mrs. Albert E. Seep of Denver, wife of the chairman of the board of Mine and Smelter Supply Co. and chairman of the AMC ladies program, said this effort on the part of the Mining Congress was most worthwhile because it afforded us an opportunity to learn in understandable terms just what the men of the mining industry are doing to protect the environment while they produce the raw materials all of us need. Mrs. Seep said this is part of a "broadening public involvement in environmental matters."

Mining Executive Named Bible Week Chairman

H. Stuart Harrison, president of Cleveland-Cliffs Iron Co., Cleveland, Ohio, has been named a chairman of industry for National Bible Week.

Harrison is active in a number of social, civic and educational agencies in Cleveland, including the Businessmen's Interracial Committee, Cleveland Center on Alcoholism, Cleveland Play House, the National Conference of Christians and Jews, University Hospitals, and JOBS, sponsored by the National Alliance of Businessmen.

He holds corporation directorships in seven other corporations, and is a leader in the iron, steel, and mining professional organizations.

Cement Expert Speaker At TIC Symposium Nov. 2-4 in New York

William G. Hime, manager of the chemical and petrographic research section of the Portland Cement Assn., will be the keynote speaker during a symposium on the inorganic applications of automated analysis at the Technicon International Congress in New York City, Nov. 2-4.

The largest meeting of its kind, the Technicon International Congress is composed of 10 symposia dealing with the most recent advances in automated analysis in clinical and industrial laboratories.

Mr. Hime will discuss the new role being played by automation in the inorganic industries. The results of a six month evaluation of Technicon's CSM@6 system for cement analysis will also be presented.

The keynoter graduated from Heidelberg College in 1948. He joined the Portland Cement Assn. in 1951. In 1969 he received a certificate in philosophy from Northwestern University, retroactive to 1951.

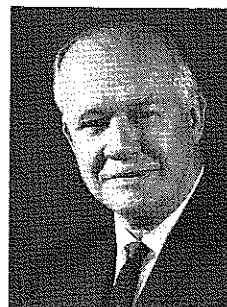
From 1954 to 1955, Mr. Hime was associate professor of chemistry at Louisiana Tech. He has published numerous papers dealing with X-ray, infrared, atomic absorption, and other techniques for cement analysis.

Papers will be presented at the Congress by leading research scientists in each field.

Now in its fifth year, the Technicon International Congress has attracted thousands of scientists and researchers from around the world. In addition to the presentation of papers, the Congress will include demonstrations of the most advanced techniques of chemical analysis and exhibits of the newest equipment in the field of automated analysis.

The Congress will be held at the New York Hilton Hotel. For additional information about registration, write to Technicon Corporation, Tarrytown, N.Y. 10591.

Executive Secretary



W. W. Fertig

Election of Officers. Another year is ending, and it is time to mail out the 1971 Ballot. The Nominating Committee made their recommendations and they were accepted by the Board of Directors. The new slate of officers to be voted on are:

1971 Officers

For President—Harrison L. Hays, 1931

For Vice-Pres.—Neal Harr, 1954

For Secretary—Vote for one

Robert W. Dalton, 1957

Alfred E. (Ted) Seep, 1968

Arthur G. Wood, 1941

For Treasurer—Robert Magnie, 1947

For Director—CSM Alumni—Term 3-years—Vote for one

Arthur T. Biddle, 1961

David R. Cole, 1952

Thomas R. Young, 1952

For Director—CSM Foundation—Term 2-years

Harold W. Addington, 1943

The Nominating Committee recommended that the same plan be followed as during the past several years—nominating only a single candidate for each office where experience is paramount. Thus, the Secretary for 1970 has been nominated for vice president, and the vice president for 1970 has been nominated for the office of president. Three fine Miners have been nominated for Secretary, and unless the Board changes the plan for 1972, then the winner will be nominated for vice-president in 1972.

Sounds complicated doesn't it? As the number of members have increased, the officers have had to assume more responsibility, devote more time to the job. Continuity is essential, and I am personally in favor of continuing the same system, but, of course, the decision rests with the Board of Directors.

The ballot provides room for write-in candidates if you wish to express your interest in electing some one other than those named by the Nominating Committee.

Membership Cards. 1971 Membership Cards will be mailed automatically on October 15th to all those members who were active in 1970. Please return the ballot, the dues card (with such corrections as may be necessary), and your check in payment of the 1971 dues.

Fortunately the number of members increased enough in 1970 to compensate for the loss in advertising revenues. The recession has curtailed industrial advertising, but it now appears that the worst is over.

Advertising. We want to thank those loyal advertisers, who have continued their support during 1970. They are the kind of friends that we need and can appreciate.

Alumni Meetings at Conventions. All of these will be reported in the November issue, as the American Mining Convention Mines Breakfast will be held on Sept. 29th; Society of Petroleum Engineers Mines Luncheon in Houston on Oct. 7th; and the Society of Metals Alumni Cocktail Party on the evening of Oct. 2nd in Cleveland.

You may receive the October Magazine in time to be reminded to attend the Society of Mining Engineers Mines Breakfast at St. Louis, Stouffers Riverfront Inn, Oct. 22nd.

Local Section Meeting. On Sept. 23rd, nine Miners gathered for dinner in Houston. They had only three days notice of the meeting and I want to thank Ray Kerr for his help in getting the Miners together. The new president of the Houston Section, Ronald E. Diedrich, Class of 1957, presided. The full report and the names of those who attended will be in the November Magazine.

Younger Members. At our recent Local Section Meetings, more Miners from recent classes have been attending. That is wonderful for some of the old-warhorses of my vintage are ready and happy to welcome younger successors to take over the responsibility of carrying on the activities of the Local Section. This is important, for it is those sections that have been our strength on a world-wide basis.

—wwf

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Wrong Caption

We apologize for not having noticed that the printer placed the wrong caption under the picture on page 42, September 1970 issue of MINES Magazine. The caption should have read:

"Dow Gives Mines Electron Microscope.—Roland Fischer, physical research metallurgist, the Dow Chemical Co., left., and Dr. Paul Herold, head of the Colorado School of Mines Metallurgy Dept., are shown dismantling additional units for the electron microscope recently given to mines by Dow. The instrument will be used by Mines students and researchers for determining structure of metals. The gift is part of Dow's AID university service program."



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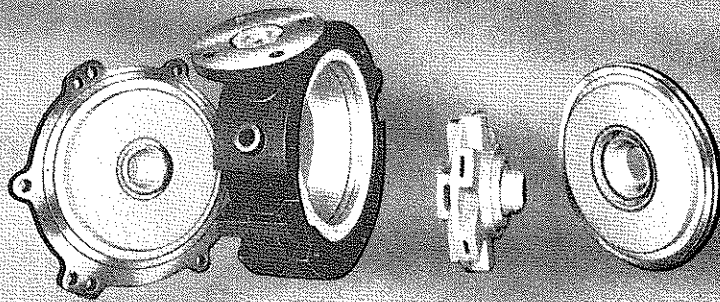
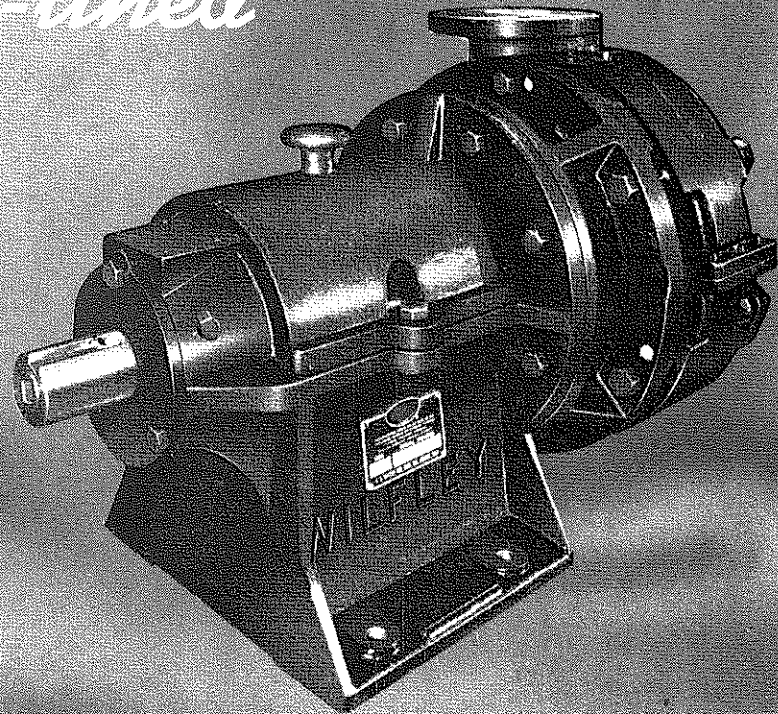
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