

After 50 years, SME remains world's premier professional mining association

The Society for Mining, Metallurgy and Exploration's origins can be traced back to 1871. This was when 22 Pennsylvania coal mining engineers founded the American Institute of Mining Engineers (AIME). The organization's objective was to "promote the arts and sciences connected with economic production of the useful minerals and metals, and the welfare of those employed in those industries by all lawful means."

Metallurgy and Petroleum were added to the AIME name in 1919 and 1956, respectively. Divisions of AIME were formed throughout the following years in recognition of the increasing trend toward specialization among mineral industry engineers. At the time, SME's divisions consisted of the Coal Division (1930, now known as the Coal and Energy Division), the Industrial Minerals Division (1935), the Mineral and Metallurgical Processing Division (1948)

and the Mining and Exploration Division (1949). The Environmental Division was created in 1997.

During the 1950s, AIME realized that each branch needed greater autonomy over its own concerns. So, in 1957, the three constituent societies of AIME were formed — The Society of Mining Engineers, The Metallurgical Society and The Society of Petroleum Engineers. This year, SME celebrates its 50th year as a member society of AIME.

Here is a look back at those 50 years. Note that some of the issues and concerns facing the mining industry today are not much different than the ones SME and the industry faced throughout the decades from 1957.

Steve Kral,
Editor

SME formed in 1957

The Society of Mining Engineers' first year of existence, in 1957, began during a commodities downcycle. Many lead-zinc-copper mines were forced to close. And the remaining mines curtailed production to stay in line with demand. Aggravating the situation were the increased costs of labor, supplies, equipment and taxes.

A diamond drill station in operation in 1957 at Homestake Mining's historic Homestake gold mine in Lead, SD.



Elmer A. Jones was the first president of SME of AIME. He was manager of the Southeast Missouri Division of St. Joseph Lead. Back then, Mining Engineering magazine did not publish a president's interview. SME was headquartered in New York.

The first board of directors meeting the Society of Mining Engineers was held at the Roosevelt Hotel in New York on Feb. 28. Arnold Buzzalini was the new Society's secretary (now known as the executive director). John Cameron Fox took over that position in July of that year.

In 1957, AIME posted a membership increase of 1,023, bringing the organization's membership to about 28,490. SME's membership was not available. Dues in 1957 were \$20 for members and associate members, \$12 for junior members and \$4.50 for student members.

Underground, the trend continued toward the increased use of rock bolting in stoping areas permitted some mines to use less timber and less labor, greatly increasing efficiencies and reducing costs. More mines began to use concrete in grizzly and scraping drifts.

A trend that began to emerge in 1957 was the use of larger equipment at openpit mines. This included improved drills for drilling larger blastholes and permitted the use of more explosives. And larger loading shovels and larger trucks continued to be put into operation at

surface operations. Also, there began a trend toward more openpit operations and fewer underground mines.

Gold mining that year was essentially an unprofitable venture. And tungsten mining in the United States all but disappeared.

The silver lining to the commodities downturn was that more mining companies turned to organized research to improve costs and methods. The industry realized that cost reductions in mining are rarely accomplished by radical changes in method or equipment. Instead, they are accomplished by study and research. So many mining companies maintained research departments, realizing that, in the long run, research is less expensive.

Coal was a \$2.5-billion a year industry in 1957. It employed about 220,000 people and some 8,000 coal mines were operated by about 5,000 companies. The National Coal Association that year predicted production would be 483 Mt (532 million st). Coal reserves then were estimated to be enough for about 2,000 years at the present rate of consumption.

Kennecott Copper bought the Garfield copper smelter

in 1958 from American Smelting and Refining (Asarco). The purchase of the smelter, the world's largest, made Kennecott Copper a fully integrated copper operation.

Anaconda merged three of its subsidiaries to form Anaconda Aluminum. The move was part of the parent company's plan for "more vigorous participation" in the U.S. aluminum market.

Meanwhile, the U.S. economy began a slow emergence from the recent recession. Domestic mineral output, however, fell below 1958 levels, valued by the U.S. Bureau of Mines to be \$16.35 billion. That was \$1.8 billion less than in 1958.

Mineral production that year fell off considerably, mostly due to previous production decreases that followed price drops. Copper production fell about 10 percent from 1957, while lead and zinc dropped by 23 percent. And iron ore production was off 36 percent from the previous year.

Stanley D. Michaelson was the SME president in 1958. He was chief engineer of Kennecott Copper's Western Mining Division in Salt Lake City, UT. Before that, Mi-

SME well-positioned for another 50 years

Jim Arnold, 2007 SME President

I joined SME as a student at the University of Idaho in 1973. SME was a place where a bunch of guys who I studied with got together to drink beer instead of study. When I got out into the real world and started to go to local chapter meetings, SME was a place where a bunch of guys who I worked with got together to drink beer instead of work. Oh yea, we had speakers, too.

As I progressed in my profession I discovered that there were people at these meetings who had the same problems at work that I had and, better yet, once in a while there was someone who had solved one of those problems. The meetings started to evolve into something more than drinking beer (the truth is that it was me, not the meetings, that started to evolve, but I didn't recognize that then).

I've witnessed 33 of the 50 years of SME's evolution. It's been a wild ride. So what comes to mind when I think of the ways SME has changed through my professional career?

Atrophy

It's curious that the world's demand for minerals has steadily grown and America's demand for mineral engineers has, until recently, steadily declined. We hit a peak of more than 27,000 members about 1982 and then dropped to nearly 10,000. Any society that loses two-thirds of its membership will have problems, and we did.

SME had some tough years but, thanks to recent leadership by the membership and staff, we are back on track. Note I did not say thanks to the improvement in commodity prices. Yes, there have been benefits to the Society from price improvements and the jump in prices

will greatly assist the Society in the future. But the successes of the past five years have come from old fashioned hard work and solid management. We are back in a growth stage, one that I expect to continue for decades.

Redefinition of "mining engineers"

In the late 1980s, the Society of Mining Engineers expanded its name to reflect the diversity of its membership. The diversity did not stop there. Since then, the Society has added an Environmental Division and a host of other specific function committees that address issues never considered then. Our Membership Committee's function has evolved from a group that qualified membership to a group that seeks new members. The GEM Committee, the SME Foundation and others have proven our peripheral vision has improved as well as our ability to react to a changing world.

Academia

The tough times in the mining industry have taken their toll on our mining schools. Schools that were literally founded as mining schools no longer teach mining or operate with truncated programs. There has also been a curious and disturbing change in academia's support for the industry.

When I was in school, most mining professors were vocal and energetic advocates for our industry. Sadly, that seems to have changed. We still have our advocates at some schools but they are harder to find. We have gone from professors who fought tooth and nail for their schools and their industry to a recent dean at a college of mines telling the press how excited he was that the university was locking the doors to his college.

It's a different day and age and the demands on our professors are different. But 20 years ago, when the Si-

chaelson was chief engineer with U.S. Steel's Tennessee Coal and Iron Division. While there, he helped complete the 18-kt/d (20,000-stpd) Concord coal mine. This project marked the first integration of rock bolting in a mining scheme as a regular production tool. The Concord project also used the largest slope belt installed in an underground coal mine at the time.

AIME's membership in 1958 grew to 30,650. Fox was Society Secretary and dues remained the same as the year before.

The industry began its turnaround in 1959. The U.S. Bureau of Mines reported that the nation's mineral production climbed to about \$17.14 billion, a \$600,000 increase from 1958. Increased production of uranium, bauxite and molybdenum helped offset losses in iron ore, copper, lead, mercury and other commodities. Those segments were frustrated by labor strikes.

In Canada, though, minerals production set a record. Its high of \$1.9 billion in 1959 was 14 percent higher than

SME presidents 1957-1959 — from left to right: Elmer A. Jones, S.D. Michaelson and J.W. Woomer.



in 1958. Uranium led the way in metals production with \$324 million in value. Gains were also gained in copper, iron ore and nickel.

J.W. Woomer was the 1959 SME president. Owner of J.W. Woomer and Associates, he worked at all levels of the mining industry and believed that all young engineers should do the same. Woomer was also against the idea of a union for engineers. "A young man must decide

erra Club professors were bashing our industry, there was someone to stick up for us.

Corporate support

The Federal Trade Commission (FTC) was a power during the early 1970s. It had to rule on every merger and acquisition in the country and its answer was uniformly "no." Mergers that don't get a second look today would have been blocked then. This, and the unrelenting pressure from the stock analysts for constant growth in stock prices has allowed an unprecedented swarm of acquisitions.

Acquisitions have led to a reduction in the number of major American mining companies. This has had a big impact on the Society. Getting support for scholarships, projects, political causes and research has been tougher because we deplete the number of places to go much more quickly. Most of the remaining companies recognize this and they have been terrific at supporting our industry. But once there was a friendly competition among the mining corporations to see who could be the biggest supporter. Now there are fewer contestants in the race.

The entire employment dynamic has changed. Unions once ruled the mine, now they are weaker; some places gone. Employees stayed with companies for an entire career. Now the employees seem to show less loyalty to the employer, and given the frequency of layoffs, the opposite is true, too.

Maybe the biggest change has been the international focus. No one graduating today should expect to work an entire career without an overseas stint. Those were much rarer, even exotic, 30 years ago.

Meetings

The first national SME meeting that I attended had a paper where the speaker was advising the audience to

remember to turn on the air in their flotation cells or the cells would sand up. No kidding. We may have had bigger meetings, more attendance and more technical sessions but we sure did not have better papers. There has been a movement toward better speakers, higher quality, more subjects covered and more focused symposia. The technical program improves every year and that is a trend that I expect to continue.

We might have fewer members but the meetings are more fun, more interesting and more gets accomplished. Good stuff.

That "sex thing"

Yea, I knew that subtitle would get your attention. My first summer job in mining was at Climax in Colorado shoveling muck onto conveyors. Down the road, the Eisenhower Tunnel was being built and a bright young engineer fresh out of school started on the support staff. The first time that engineer went underground the workforce quit working on the spot and walked out. No, it wasn't quitting time and, no, there wasn't a mechanical problem...the issue was much more permanent. The young engineer was a female. That was her only infraction — being a young lady. In those days, it was considered unlucky for a female to be underground.

As SME approached its 50th anniversary, the retiring president of the Society, one of the best leaders in the history of the organization, was Barb Filas.

The evolution of our Society has been exciting to watch. We are now positioned for another 50 successful years and more. Through the coming years, we can expect the same sort of dynamics and our members will need to be nimble enough to react to those changes. There is one thing that has not changed, which I'm thankful for, I can still get a beer at the meetings. ■

SME presidents 1960-1964 — from left to right: Arthur B. Cummins, James C. Gray, William B. Stephenson, Edward G. Fox and Sanford S. Cole.



whether he is going to be an educated individualist or an employee who needs the protection of a 'mother' organization," he said.

The upcycle continued in 1960, as the value of mineral production in the United States increased by 4 percent to \$1.8 billion. That was second to 1957's record \$18.1 billion.

Metals production in 1960 increased by 28 percent to \$2 billion. Much of that increase came from the increased production of copper, iron ore, vanadium and tungsten, with increases ranging from 30 percent to 40 percent. Those commodities were hit hard in 1959 by labor disputes.

Bituminous and lignite coal output in 1960 showed a modest increase of 0.7 percent. Production was retarded by increased competition from other fuel sources, such as oil and gas.

Anthracite coal production was down 13 percent, ending the year at 16.4 Mt (18.1 million st). And shipments to Canada and overseas destinations were off by 15 percent and 21 percent, respectively.

The U.S. Department of the Interior in 1960 warned that defense requirements for 26 minerals and metals may climb above current consumption levels. And nine metals will be needed for missile and space requirements. Those commodities included bismuth, columbium, hafnium, molybdenum, palladium, platinum, tantalum, tellurium and titanium.

In South Africa, The Hartebeestfontein Mine set a record for shaft sinking. The project sank more than 366 m (1,200 ft) of 7-m- (24-ft-) diameter of a concrete-lined shaft in 31 days.

A.B. Cummins, 1960 SME president, addressed the issue of qualified mining professionals, an issue *ME* readers are familiar with today. In 1958, mining engineering degrees were conferred on 220 students. In 1959, that fell to 205 and 190 were projected for 1960, he said. At the time, there were not enough jobs available. "But this is an unnatural, unhealthy and unsafe national position," he said. "There is a need to emphasize and bring to the attention of better qualified young men the opportunities and satisfactions of a career in minerals engineering."

SME announced that year that it would begin printing preprints in *Mining Engineering* in addition to *Transac-*

tions. The goal was to make available to members meeting preprints as quickly as possible.

Gold production remained stagnant in 1961. In fact, it declined to its lowest peacetime level in 77 years. Its value that year was \$53.1 million, compared with \$58.3 million in 1960. The decline was partly due to a decrease in placer recoveries in Alaska and California as well as declines in byproduct copper production.

In line with that decline, Golden Cycle announced that it was stopping operations at its Cripple Creek, CO operations. The federal monetary system at the time called for the sale of all newly mined gold to U.S. Treasury for \$35/oz. The result was that the property had been operating at a loss. Golden Cycle said it could produce gold for \$60/oz.

Silver production, meanwhile, posted an increase for the year. Its value in 1961 increased by 12 percent to \$31.2 million.

J.C. Gray, SME's 1961 president, reminded the membership of its responsibilities in developing the mining industry to meet the demand of the 1960s. "The task ahead becomes more diverse, more complicated and certainly more demanding," he said. "The purpose of our society is accentuated by the needs of 'the promising Sixties.'"

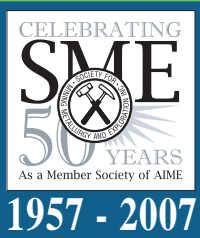
Fox remained Society Secretary in 1961. AIME's membership was 34, 500. And *Mining Engineering* began publishing the number of copies it printed for each issue. That year, the magazine averaged 15,700 copies. Also in 1961, SME's Industrial Minerals Division and the Canadian Institute of Mining and Metallurgy hosted a joint conference in Ottawa, Canada. About 200 people attended.

In 1962, American Metal Climax (Amax), a major producer of copper, zinc and lead, announced that its long-range focus would shift to "space-age minerals." The company said the minerals "the man of the 1970s would need will be molybdenum, tungsten, cobalt, cadmium, uranium, vanadium, germanium, potash and chlorine."

Meanwhile, Stauffer Chemical brought online its \$10-million trona mine and soda ash refinery at its Green River, WY operations. The plant would produce between 165 kt and 180 kt/a (150,000 and 200,000 stpy) of soda ash. Today, the trona beds in Green River are among the largest in the world.

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SME 50TH ANNIVERSARY

SME presidents 1965-1969 — from left to right: Jack M. Ehrhorn, Wayne L. Dowdey, Dennis L. McElroy, Raymond H. Feierabend and Bower Dellinger.



The Montreal iron ore mine in Montreal, WI was closed because of the changing world market, mine owner Oglebay Norton said. The mine, employing 600 people, had been in operation since 1886. E.W. Sloan, Oglebay Norton's president, said, "we have found it impossible to sell our Gogebic ore due to the great changes that have occurred in the iron ore market in recent years. The availability of higher grade, better structured beneficiated ores and ores from foreign sources, along with the natural priority that consumers give to their own captive operations, seem to us to have completely extinguished the market for merchant ores such as ours."

William B. Stephenson, of U.S. Steel, was the president of SME in 1962. During his year as president, SME held its first Fall Meeting in Gatlinburg, TN. More than 600 people attended. *Mining Engineering* printed an average 15,700 magazines per issue and annual membership dues remained \$20 for members and associate members, \$12 for junior members and \$4.50 for student members.

The United States minerals industry produced a record \$19.7 billion worth of minerals in 1963, according to the U.S. Bureau of Mines. That was \$800 million higher than in 1962. The most remarkable increase was Pennsylvania anthracite coal. Its 1963 production reached 410 Mt (452 million st), up 7.1 percent from 1962. The increase was attributed to increased shipments to Europe and the need for domestic consumers to replenish stocks.

Lead and zinc, which languished for several years due to surplus inventories, also made significant recoveries in 1963. Producer stocks were reduced drastically from 1962 and prices for both metals likewise increased significantly.

The value of gold production, however, decreased again, down to \$49.8 million from 1963's \$54 million. The value of silver production, though, increased again, reaching \$45.1 million.

Edward G. Fox was the 1963 SME president. He was the president of the Bituminous Coal Operators Association. The upswing in the minerals industry that began in the latter part of 1959 continued in 1964. The U.S. Bureau of Mines said that domestic production was valued at a record \$20.4 billion. This unprecedented demand for minerals and metals stimulated the development of new mines and the expansion of the nation's existing processing capacity.

Production of thermal and lignite coal increased by 4.6 percent to about 435 Mt (480 million st). However, after a significant increase in 1964, anthracite production suffered an 11 percent reduction in production. A decline in exports was the main cause for the decrease.

Texas Gulf Sulphur announced a major copper and silver discovery near Timmins, Ontario. Reserves at the time were 23 Mt (25 million st). The company said the deposit could be mined by openpit methods with average grades of 1.8 percent copper, 8.1 percent zinc and 130 g/t (3.2 oz/st) silver.

In 1964, Bucyru-Erie put into operation the largest walking dragline ever at a Kentucky coal mine operated by Pittsburg & Midway Coal. The model 1450 had a 46 m³ (60-cu yd) bucket. It was said to be able to reach 75 m (246 ft) and as deep as 15 m (50 ft). The machine was powered by 65 electric motors, totaling 6.7 MW (9,000 hp). Working around the clock, the 1450 could move 38,225 m³/d (55,000 cu yd/day) of material.

Sanford S. Cole was president of SME in 1964. AIME membership was 35,500 and *Mining Engineering* printed an average 15,400 copies each month.

Four SME members were presented Distinguished Achievement medals from the Colorado School of Mines in 1964. Vincent N. Burnhart, class of 1932, was president of E.J. Longyear. Edwin H. Crabtree Jr., class of 1927, was director of the CSM Research Foundation. Albert M. Keenan, class of 1935, was president of Thompson Creek Coal and Coke. George Ordonez, class of 1929, was a consulting geologist who did much work in Mexico and South America. Jack M. Ehrhorn was SME president in 1965. *Mining Engineering* printed an average of 16,000 copies per issue and AIME's membership continued its growth to 35,530.

Molybdenum Corp. of America announced plans to put into operation its openpit molybdenum project in Questa, NM. The \$18- to \$20-million mine was to begin initial production in September 1965 and reach full production in January 1966. And Kennecott Copper said it would spend \$6 million to increase copper production by 22 kt/a (24,000 stpy) at its Chino, NM mine.

Cleveland-Cliffs in June 1966 announced a major sales agreement with seven Japanese steelmakers. The deal, valued at about \$900 million, involved the purchase of 64.8 Mt (71.4 million st) of iron ore pellets from Cliffs' Robe



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River operations in Western Australia. The company was to ship the pellets, with an average of 64 percent iron, at a rate of 3.2 Mt/a (3.6 million stpy). Cleveland-Cliffs Robe River holdings contained more than 450 Mt (500 million st) of ore.

The engineering profession as early as 1966 began to see that the public had little interest or understanding of what it does. So the National Society of Professional Engineers added to its public relations staff and hired an outside public relations firm as part of a national campaign aimed at increasing the public's understanding of engineering in relation to other professions, such as medicine, law and teaching. The engineering profession was concerned that the public had a poor understanding

of what engineers do and that the profession was not attracting enough young engineers to meet the technological needs of the future.

In September 1966, Bechtel was awarded a contract to perform engineering studies at Copper Range's White Pine, MI operation. The company planned to double its copper production capacity to 122 kt/a (240 million lbs/year). The White Pine Mine was Copper Range's largest copper mine. Its reserves were thought to amount to 10 percent of total U.S. copper reserves.

Wayne L. Dowdey was president in 1966. In addition to sustaining SME's strong drive, he was a believer in local section activities. Even before he became president, Dowdey spent much of his time traveling to local section meetings promoting their interaction at the national level. He also was instrumental in creating SME's Career Guidance program as well as the Society's Visitation program.

In 1967, Amax began shaft sinking at what would become the world's largest primary molybdenum mine. The company announced in February that it would begin sinking a 7.3-m- (24-ft-) diameter shaft at its Henderson project near Empire, CO. The 716-m (2,350-ft) shaft would permit delineation drilling on the high-grade molybdenum deposit. Preliminary estimates were 140 Mt (154 million st) of proven ore reserves at Henderson grading 0.45 percent MoS₂. Even though turning the deposit into a mine was deemed expensive, the company said it expected to be in operation in the early 1970s.

The Bunker Hill lead smelter, a fixture in the Kellogg, ID community for decades, announced plans to clear the town's air of sulfur dioxide that was released from the smelter. The \$3-million project would capture the emissions and be used to make sulfuric acid. The project would increase the smelter's sulfuric acid output by about 82 kt/a (90,000 stpy), Bunker Hill said.

In 1967, enrollment in the nation's mining schools was low. Dennis L. McElroy, a former executive with Consolidation Coal, was president of SME. He recognized that the mining industry needed to do a better job of attracting students to the minerals industry. One of his priorities as SME president was to cultivate programs that reached students as early as junior high school. 1967 was also the first year that SME published its membership figures in *Mining Engineering*. Membership at the end of December was 13,745, the Society reported.

In December 1969, Standard Oil of

SME

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Ohio (Sohio) acquired Old Ben Coal in a share-for-share swap. Sohio said Old Ben Coal was “a well managed, efficiently mechanized coal producer with good growth potential, using the most modern facilities.” The acquisition was part of a trend that saw major oil and gas companies acquiring mining companies. The thinking was that mining would be a good fit because both industries were natural resource producers. The trend came to an end during the 1980s when the oil companies began to shed their mining interests. They realized that mining operations could not be run the same way an oil project is run. And because of the high cost and long lead times necessary to bring mines online, the return on investment was much longer than the oil companies wanted.

SME President Raymond H. Feierabend made membership development his goal for the Society. The long-time executive of Freeport Sulphur believed that all engineers must belong to their professional societies in order to achieve their own maximum growth in their chosen field. So he pursued policies designed to attract all qualified mineral industry engineers to SME. The

1970s — SME moves headquarters from New York

The war in Vietnam stretched into another decade, an American President was at the brink of impeachment, the earth was given its own day, twin tower monuments of American ingenuity were completed in New York and would stand high above the Manhattan skyline for 31 years. Inflation, oil shortages, low commodity prices and America’s 200th birthday were part of the decade — it was the 1970s.

For the mining industry, the demands of the decade would be high and the challenges would be significant.

Because of the many challenges that lined up in front of it, the mining industry was forced to work smarter and more efficiently. The industry also expanded its borders in search of new resources and struggled along with the rest of the world through a fuel crisis, inflation and a recession.

More metal at a lower profit was demanded from companies early in the decade and most met the challenge. Of interest to the industry was pneumatically applied concrete roof and wall support. Many mines began changing methods for the adaptation of load-haul-dump units.

The computer also began to play a role in the industry. By the late 1960s many plants had computers that were being used for logging, monitoring and reporting of data. By 1970, they were being given serious consideration before the construction of any major mineral processing plant was built.

H. Rush Spedden, director of research at Kennecott Copper, in Salt Lake City, UT, became SME’s first president of the decade. His goal was to build a stronger base from which to tackle problems of the 70s. “We must get the word across that our profession is vital to man’s needs and that we are striving to make this earth a better place to live.

“Our progress will emphasize the technology to increase mineral production within the constraints of an improved environment. Career guidance, continuing education and wider information dissemination are keys to our future,” he said.

The environment became more of a concern, so much

Society’s membership grew to about 14,320 that year.

In 1969, Syncrude Canada submitted its third application to the Alberta government for permission to develop a portion of the province’s massive tar sands. This most recent application asked for a three-year delay in the project that would extend construction work from three years to six years. Startup of the proposed \$300-million project would be in 1976. Syncrude Canada is a joint venture among four large oil companies — Atlantic Richfield, Cities Service Athabasca, Imperial Oil (controlled by Standard Oil of New Jersey) and Royalite Oil (a subsidiary of Gulf Oil Canada).

Brower Dellinger, manager of National MacIntyre’s mining and exploration department, was SME president in 1969. He, too, emphasized membership development and increasing Society income.

Also in 1969, SME’s membership continued its growth, reaching 14,860 at the end of December. All that while, however, dues remained \$20 for members and associate members, \$12 for junior members and \$4.50 for student members. ■

so that *Mining Engineering* introduced a department in the magazine titled “Safeguarding Our Environment.”

The public relations task was as big then as it is in 2007 — the second “Safeguarding Our Environment” column spelled out the challenges facing the industry by quoting this from the *Wall Street Journal* — (King Coal’s Legacy — April 22, 1970) — Saving the environment seems only a dim hope in the wastes of Appalachia ... Mining has left region with acid in waters, fires underground and cave ins ... The coal industry has long since left this land dead beyond all reasonable hope of reclamation.”

Mining Engineering answered the scathing article by writing, “Suffice it say that mining industry has a distinct and formidable public relations task before it.”

Despite the pressures and damaging images that circulated in the year in which the Environmental Protection Agency and “Earth Day” were born, the industry forged ahead.

The Anaconda Company constructed the Twin Buttes operation 40 km (25 miles) south of Tucson, AZ — it comprised the largest earth moving task performed in mining history — moving 236 Mt (260 million st) of rock.

In 1971, AIME, SME’s parent association, celebrated its 100th year. The Centennial was celebrated in February of 1971 and *Mining Engineering* added a monthly supplement throughout the year commemorating the foundation that was started in 1871. David Thomas was the first president and Rossiter Worthington Raymond was the first vice president of AIME.

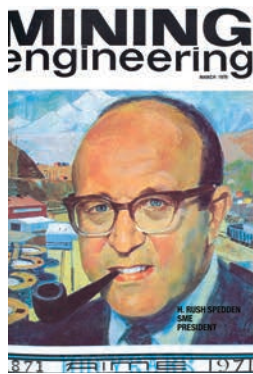
The demand for low-cost mineral commodities from reserves of decreasing tonnage and grade along with increasing mining ratios encouraged the establishment of larger mining operations. The mammoth mines began looking for large materials handling and transportation equipments.

SME President James D. Riley took over in 1971 and put his focus on the human side of engineering.

“It is my opinion that if

William M. Gleason,
Associate Editor

SME presidents 1970-1974 — H. Rush Spedden, James D. Reilly, Robert M. Grogan, Robert H. Merrill and Donald A. Dahlstrom.



in the 1970's we can increase our ability to work together as miners, managers, engineers, federal and state inspectors we will be able to hold the line on cost and increase productivity... As you know, our economy starts with raw material and energy. I believe the mining industry can do more to slow down inflation than any other group," he said.

1971 was also a year of politics and the beginning of an era of legislation for the mining industry. So much so that the actions of federal lawmakers and politicians overshadowed the technical developments. The nationalization of Chilean copper was the most far-reaching event of 1971.

In the United States, the enforcement of rigorous federal mine health and safety laws were in full swing, especially in coal mining.

The emphasis of lawmakers and environmental groups, preservationists and conservationists as they were commonly called then, focused on surface mining. More than 20 laws were introduced to regulate surface mining and mine land reclamation.

In underground mining, an uncertain business climate and low prices took a toll on new development. The trend was to refine and improve existing techniques. It was a difficult year marked by layoffs.

It was also a big year for technology, in and away from the mining industry. The microprocessor, the foundation of all computers, was introduced. Also in 1971 was the end of the Gold Standard for American currency. Gold payments ended in 1971 in an attempt to halt the increasing inflation in America.

After the Gold Standard was stopped the price of gold was set by market conditions. Previously, it had been set by the government. This was great news for gold miners who were once again able to make a profit as market conditions drove the price of gold up.

Politics and rigid health and safety regulations and environmental legislation continued to play a large role in the industry in 1972. All of those factors, and others, led to layoffs and slowdowns in the mining industry, making SME's role to its members even more important than before.

SME President Robert M. Grogan said the Society could be a great help to its members in a time of employment crisis and loss of courage and faith on the part of management.

"We hope to keep the Society strong and growing and enable it to offer increased service to members."

He also said it was time for an increase in dues and took the unenviable task upon himself. "As the president it will be my duty to explain this to Society members and encourage them not to drop their membership and recognize its value," said Grogan.

Nuclear energy and other fields began to take hold as a result of the National Environmental Policy Act (NEPA) of 1969.

One section of NEPA required all federal agencies

The Twin Buttes Mine in Nevada as it looked during the 1970s.



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SME presidents 1975-1979 — R.L. Llewellyn, John F. Harvard, Donald D. Rausch, Robert S. Shoemaker and Robert Stefanko.



include a detailed statement on specified environmental conditions as part of every report on proposed actions significantly affecting the quality of the human environment.

It was the first step in what would become the lengthy permitting process of every future mine.

Internationally, attempts for Vietnam peace failed, the 1972 Olympic games in Munich were disrupted when Israeli athletes were taken hostage and killed by PLO members.

In the United States, the burglary of the Watergate Hotel was committed. It was an act that would lead to the fall of President Richard Nixon.

Technology continued to advance, by necessity, in 1973. Increased resistance from the public and a shortage of manpower forced the industry to focus on technological advances such as using infrared scanners to find mineral deposits.

Despite the problems, the demand for materials was high.

In 1973, SME President Robert H. Merrill focused on the next generation. "Our future lies in our young engineers. These young lions question everything that we over-the-hill guys tell them... They want to know the fundamentals and the facts and they want to know the amounts of technology we have developed in our profession and be free to use it. I want to begin to help them improve their competence and at the same time be attentive. It is the youngsters who are going to maintain the strength of our nation and our standard of living," he said.

That same year, SME moved out of its 13th floor offices in the United Engineering Building in New York City for the first time. A new tax on the United Engineering Building in 1972 and the desire to be closer to bulk of the operating mines in America were two reasons for the move. The Society found a home closer to the mines of the West and settled in at what would be a temporary home with offices in Salt Lake City, UT. The initial move consisted of 10 people. Also in 1973, Claude L. Crowley was named executive director of SME.

While the mining industry struggled with its own problems, things would get more challenging for America when OPEC doubled the price of oil sparking the gas crisis. Oil prices went from US\$1.50 to US\$11.56 a barrel in the course of a few months.

Nixon released the Watergate tapes and the Endangered Species Act was passed.

Risks and uncertainties aside, the industry continued to strive ahead in 1974 while exploring and developing new orebodies.

President Donald Dahlstrom focused on opportunity within SME.

"We hope to give individual members more of an opportunity to participate in committee programs," said Dahlstrom. "I think there is a feeling among many members that committee selection originates at the top of the society rather than the bottom. I would like to change this."

Shortages in fuel, material and manpower and money power along with increasing inflation and changing global attitudes towards mining caused much uncertainty.

Nixon resigned from office, making way for Gerald Ford in 1974.

The mining companies scrambled to search for new ore bodies, chasing behind the fluctuating economy of 1975.

The energy crisis deteriorated during 1975 and miners responded by intensifying the search for uranium in all corners of the globe.

Surface mining costs rose and profits declined. Coal production slowed and miners hunkered down to weather the down cycle.

One area that grew during the difficult times was equipment which got bigger and bigger.

R.L. Llewellyn became president of SME and faced the daunting challenges that came with the times. The image

of industry continued to be hit, so much so that Llewellyn put his efforts into that challenge.

“As mining people. We must continue to expand our technical know-how and make better use of it. In today’s context however, that is not enough,” said Llewellyn. “We must also improve the public image of mining.”

The mineral industry dealt with falling demand that followed sharp declines in auto production, housing, appliances and other consumer goods.

John F. Havard assumed the role of SME President in 1976. He put much of his focus on the educational aspects of mining engineering.

“Today’s mining engineer needs a more intensive education — including such newer subjects as rock mechanics and computer sciences — and even more important, he needs additional training to enable him to communicate clearly, to negotiate and administer labor contracts, to cope with complex safety and environmental laws and to understand the political and public relations aspects of the job,” said Havard.

Donald O. Rausch took over as SME President in 1977. The effects of recession and inflation were the topics of the day, but Rausch looked deeper to the lack of a nonfuels energy policy. He said America was in need of a policy that would support a domestic mineral policy. He also focused on improving communications within SME. The Society’s membership in 1977 was 22,472.

Outside of the SME offices, things were bleak. The year-long depression of the copper industry was marked by layoffs, shut downs and mine closures. Collapse of the nickel market and the passing of the Surface Mining Control and Reclamation Act added to the doldrums.

As the 1978 SME President, Robert S. Shoemaker,

The 1980’s —hard times with a golden lining

The early part of the decade was marked by worldwide problems and economic difficulties. In 1980, President Jimmy Carter ordered the failed military mission to rescue hostages in the U.S. Embassy in Iran, Mt. Saint Helens, WA erupted killing 60 people and the Soviets and Mujaheddin guerrillas clashed in Afghanistan after the Soviet invasion. Later in the year, Ronald Reagan was elected president, defeating Carter. The first launch of a space shuttle (Columbia) occurred in 1981. Also in 1981, the first IBM-PC’s begin to roll off the lines. In 1982, Argentina invaded the Falkland Islands and Mexico’s economy was in collapse. In 1980, the U.S. unemployment rate stood at 7.1 percent, and by 1982 the rate increased to 9.7 percent.

1980 marked SME’s first full year in its new office building in Littleton, CO. The new facility was dedicated in November 1979. Claude L. Crowley was executive director of SME in 1980 and remained in that position throughout the decade. SME’s membership stood at about 26,000 throughout this period (1980-1982).

Throughout the decade, SME continued to carry out its mission of information transfer for the mining industry with the continued publication of *Mining Engineering* magazine, the annual *Transactions* of the Society for

William R. Yernberg,
Associate Editor

Mining, Metallurgy and Exploration and numerous books on mining.

These were difficult years for the mining indus-

try. Most U.S. mineral producers were being squeezed between stagnating metal prices and rising costs. Most facets of the mining industry suffered a major recession, and almost every major mining industry research and development facility was closed. Recessionary conditions in the Western World in the early 1980s resulted in a slowdown in new mine development, and major new base metal projects were scarce worldwide.

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Anamax Mining Company’s copper recovery plant in Sahuarita, AZ, around 1980.



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In the 1982 Annual Review (*Mining Engineering*, May

1983), the situation was summed up with the headline "Mining industry hits bottom." The article noted, "It was the worst of times for the mining industry, perhaps since the great depression." 1982 saw mineral prices strike 30-month lows, while companies struggled to stay in the black by closing mines and laying off massive numbers of employees.

In 1980, there was a copper industry strike, energy shortages and troubles in the iron ore and uranium industries. There was also much discussion about a U.S. nonfuels mineral policy, and there was considerable corporate interest in mining company mergers. 1980 production figures for 68 minerals showed that 42 of them decreased. During his presidential campaign in 1980, Ronald Reagan announced that he would form a strategic minerals task force to determine U.S. access to strategic and critical minerals.

Exploration activities in 1980 also felt the effects of the unstable economic conditions. Following the Three-Mile-Island accident in 1979, the price for yellowcake dropped. In 1982, copper was being offered at a five-year low of 55 cents/lb.

It was against this backdrop that Nelson Severinghaus Jr., president of Franklin Limestone, became the president of SME at the Annual Meeting in Las Vegas. In a 1980 interview in *Mining Engineering*, Severinghaus echoed industry frustration and put much of the blame for the mining industries problems on "government overregulation." He said, "We must have the cooperative participation of our government" and noted, "We are not being heard."

At that time, the mining industry was expressing much resistance to the increased environmental regulation that had become law. Severinghaus blamed "environmental extremism" for much of the regulation that he believed was hurting the industry.

As a result of several environmental disasters in the 1970s, the U.S. Congress passed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1980. The law created a special tax that funds a trust fund, commonly known as Superfund, to be used to investigate and clean up abandoned or uncontrolled hazardous waste sites, which included numerous mining sites.

At the 1981 SME Annual Meeting in Denver, CO, Alfred Weiss, assumed the presidency of SME. Weiss pointed out that the "U.S. minerals industry has certainly been threatened by government regulation." However, Weiss noted that many of his colleagues had "focused on factors over which we in the industry have little control." These included external factors such as environmental and safety regulations. Weiss said, "The industry must instead focus on internal factors such as increased emphasis on research and development, technological innovations, exploration and cost control."

Maurice Fuerstenau became the 1982 president at the SME Annual meeting in Dallas, TX. Fuerstenau's focus was more on education issues. He expressed concern about whether the [mining] industry could assimilate the 700 students that were graduating from mining schools each year. He also expressed concern about a dwindling number of mining faculty at mining schools.

Not all was bleak in the industry. On the brighter side, the outlook for coal continued to improve, fueling expectations that a long-awaited boom was at hand. In 1980, U.S. coal production rose 6.9 percent to 750 Mt (826 million st), primarily because of higher oil prices and the setbacks in the nuclear industry as a result of Three Mile Island.

Another bright note was the gold industry. Through much of the 20th century, the gold mining industry was in decline in many countries. It was not until a dramatic price rise in 1980 that the industry experienced another transformation. Old mines were revived and exploration activity exploded. The average gold price in 1980 was \$19.7/g (\$612/oz), compared with 9.83/g (\$306/oz) in 1979 and 6.27/g (\$195/oz) in 1977. Gold peaked briefly at \$24.4/g (\$760/oz) on Jan. 16, 1980.

Because of the increase in the gold price, Western World gold production almost doubled during the 1980s, rising from 962 t (31 million oz) in 1980 to around 1.744 kt (56 million oz) by the end of the decade. A new era of gold rushes occurred, with prospectors swarming to alluvial deposits in various countries including Brazil, Venezuela and the Philippines. Serra Pelada in Brazil proved to be one of the richest placer deposits ever found, yielding 13 t (420,000 oz) in 1983 alone.

The application of new technologies to the mining, milling and recovery processes also contributed to the gold boom. They enabled the development of orebodies that would previously have been considered uneconomic, notably in Nevada, which eventually accounted for more than 60 percent of U.S. production by the late 1980s.

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SME presidents 1980-1984 — from left to right: Nelson Severinghaus; Alfred Weiss; Maurice C. Fuerstenau; Louis Kuchinic, Jr.; and Frederic L. Kadey, Jr.



Mid-1980s (1983-1986) — “Mining industry begins a slow comeback”

The mid-1980s featured continued economic troubles worldwide. In 1983, President Reagan announced the defense plan called Star Wars, Sally Ride became the first American woman in space and the U.S. embassy in Beirut was bombed. In 1984, Reagan won re-elected in a landslide. Also in 1984, a toxic gas leak from Union Carbide plant in Bhopal, India, killed 2,500 people. Leaded gas was officially banned in the United States in 1985. Also in 1985 the U.S. became the world’s biggest debtor nation, with a deficit of \$130 billion. In 1986, the Challenger space shuttle exploded, the worst nuclear disaster ever occurred in Chernobyl and the Iran Contra Scandal was first reported. In 1983, the U.S. unemployment rate stood at 9.6 percent.

SME’s membership in 1983 was about 28,730. However, because of the ongoing economic issues facing the mining industry, membership began to slip and, by 1986, membership decreased to about 25,740. Throughout the mid-1980s SME continued to publish valuable books for the mining industry. In 1983, the *Fifth Edition of Industrial Minerals and Rocks* was released, and in 1985, the *SME Mineral Processing Handbook*, edited by N.L. Weiss, was published. Both books became classic references for mining and processing engineers, respectively. In 1984 SME began publication of the *Minerals & Metallurgical Processing* journal, which remains today a valuable forum for mineral processing papers.

Despite the continued economic problems, there were signs of a possible recovery in the economy, and beginning in 1983 the U.S. mining industry began a slow comeback. Compared with 1982, the value of nonfuel mineral output increased by 8 percent to \$21.2 billion in 1983. Surges in the mineral consuming sectors, such as construction and automobile manufacturing, helped the mining industry recover. Raw steel production in 1983 rose 14 percent. Precious metals continued to increase, with gold production up 11 percent above 1982’s production. And, after a dismal period, the coal industry gradually recovered in the second half of 1983. Precious metals continued to dominate, and there was much interest in cyanide heap leach technology.

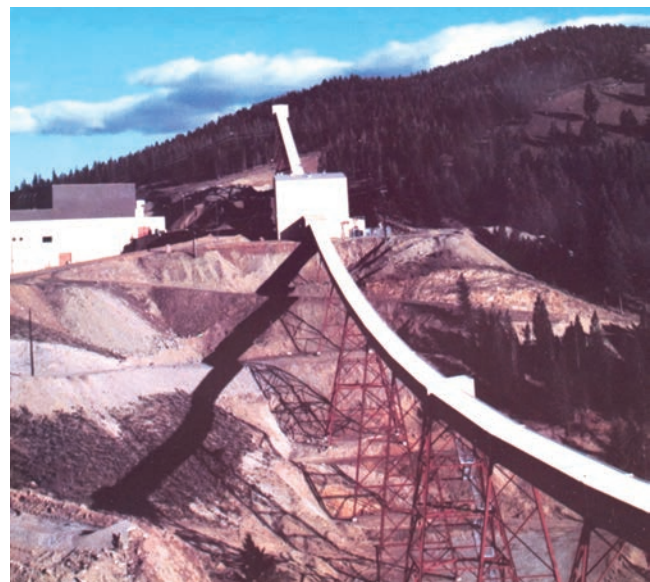
At the 1983 SME Annual Meeting in Atlanta, GA Louis Kuchinic, president of Controlled Resources and Wise Oil and Gas Exploration, became SME’s president. Kuchinic focused on communication issues and stated,

“We must work through our professional societies to educate the public that engineering is comparable to law and medicine.”

Even with the slow economic recovery in the United States, the domestic mining industry was beginning to face deeper problems, such as stronger foreign competition, radical changes in demand and obsolete facilities. It was becoming obvious that the U.S. mineral facilities would need to modernize and streamline to adapt.

In 1984, the demand for nonfuel minerals steadily improved each quarter. New housing starts rose and automakers were turning out 15 percent more cars and 30 percent more trucks than in 1983. Nevertheless, many mining companies were still experiencing difficulties, and there were indications in 1984 that a strong dollar and increased imports were slowing the U.S. mining industries’ recovery. In 1984, steel production rose 10 percent but remained well below production levels found in the late 1970s. Coal production rose 14 percent in 1984 and the precious metals industry continued on a roll. The industrial minerals sector also continued to improve year by year. The U.S. unemployment rate dropped to 7.5 percent in

Despite low molybdenum prices in 1984, Amoco developed the Thompson Creek mine in Idaho as a low-cost producer of molybdenum.



1984, but this did not seem to help the mining industries' employment picture.

Frederic Kadey, Jr., predicted an industry upturn when he took over the SME presidency at the 1984 Annual Meeting in Los Angeles, CA. Kadey said, "There is no doubt that this worldwide recession has reduced the need for just about all minerals." However, he said he was optimistic and noted, "with the economic upturn, we will see the minerals industry improve." Kadey noted, "The minerals industry typically lags behind the economy and the economy was improving."

However, a year later in 1985, as reported in *Mining Engineering*, most U.S. metal mining operations were still experiencing difficulties despite increased housing starts and increased auto production. This was attributed to newer engineered materials, emphasis on multi-unit housing and downsizing of motor vehicles. Recognizing the continued difficulties of the U.S. mining industry, many corporations made major efforts to retrench by selling, closing and spinning off operations and renegotiating labor contracts. The strong dollar encouraged imports and made exporting more difficult.

Over a five-year period, Codelco spent \$350 million annually on expansions in the late 1980s, including Chuquicamata, shown here.



The 1985 SME Annual Meeting was held in New York, where Thomas Falkie, president of Berwind Natural Resources, became the SME president. In light of the continued difficulties in the mining industry, Falkie urged "creative marketing of mineral commodities and more financial sophistication." He noted the cyclic nature of mining and said, "Mining people tend to be overly optimistic when times are good and overly pessimistic when times are bad."

Gold prices dropped to an average of 10.2/g (\$317/oz) in 1985. However, despite this, 1985 was another big year for gold exploration and development. In the United States, raw steel production fell 4 percent, and iron ore production fell 7 percent. Copper production remained unchanged in 1985. However, U.S. coal consumption reached new heights in that year.

In 1986, despite the fact that the U.S. economy passed

the \$4 trillion mark, the value of metals production in the U.S. remained unchanged. Copper production rose slightly in 1986, but steel production dropped another 7 percent with the quantity of imported steel rising 33 percent. U.S. gold production, on the other hand, was up a staggering 45 percent as the price of gold rose to \$11.8/g (\$368/oz) in 1986.

A. Tobey Yu, vice president of operations, Hewitt-Robins, became the 1986 president of SME at the Annual Meeting in New Orleans, LA. Yu challenged SME to "foster needed engineering innovation and creativity." Yu blamed much of the problems in the industry on over-supply caused by overexpansion in the past, particularly in Third World countries. "Billions were spent to build mammoth plants and facilities," he said. Yu noted, for example, "copper sold for \$1.50/lb in 1980 and dropped to 60 cents/lb in 1986, but during that time Chile's copper production increased by 80 percent."

Late 1980s (1987-1989) — "Mining industry optimism and signs of better times"

The largest stock-market drop in Wall Street history occurred on "Black Monday" — Oct. 19, 1987 — when the Dow Jones Industrial Average plunged 508.32 points, losing 22.6 percent of its total value. That fall far surpassed the one-day loss of 12.9 percent that began the great stock market crash of 1929 and foreshadowed the Great Depression. Also in 1987, President Reagan announced the United States' first trillion-dollar budget. In 1988, work was begun on the Chunnel, connecting Great Britain and France. It would become the world's longest undersea tunnel. Also in that year, the Iran-Iraqi war ended, the Soviets withdrew from Afghanistan and George H.W. Bush defeated Michael Dukakis in the presidential race. In 1989, the Berlin wall was torn down; the Exxon Valdez oil disaster occurred in Alaska; students protested in Tiananmen Square, Beijing, China; and the United States invaded Panama to oust Manuel Noriega. In 1989, president Bush authorized \$300 billion tax dollars to prop up the collapsing savings and loan industry. The U.S. unemployment rate was 6.2 percent in 1987.

Despite the stock market collapse, the U.S. economy grew steadily and the value of domestically processed minerals rose slightly, and metal prices rose sharply by the end of 1987. A number of mining and metal companies experienced increased profitability, fostering more optimism about the future. This occurred despite a 10 percent drop in new housing starts and a 9 percent drop in new car production. Raw steel production rose 7 percent and coal production was up 2 percent. Interest in precious metals surged and U.S. gold mining was up 30 percent to 150 t (4.9 million oz). The gold price in 1987 averaged \$14.3/g (\$446/oz), up from \$11.8/g (\$368/oz) in 1986.

This modest 1987 recovery in the U.S. mining industry permitted increases in exploration expenditures, and favorable market conditions allowed the gains to be sustained through 1988. *Mining Engineering's* 1988 An-

SME presidents 1985-1989 — from left to right: Thomas V. Falkie, A. Tobey Yu, Bruce A. Kennedy, Haydn H. Murray and Robert E. Murray.



nual Review pointed out that “despite the October 1987 worldwide stock market crash, by nearly all measures the performance of the U.S. minerals industry was strong. The weak U.S. dollar the strong growth in worldwide capital spending increased U.S. exports.”

At the 1987 SME Annual Meeting in Denver, CO, Bruce Kennedy, Asamera Minerals, assumed the duties of president of SME. Kennedy said, “There is no doubt the U.S. mining industry is shrinking in size, and I believe it will shrink further still. SME must push forward with its goal to increase international involvement from the Society.”

Because the U.S. mining industry was shrinking, SME’s membership in 1987 sunk to about 23,765, and by 1989, membership was about 20,054, a loss of 20 percent throughout the decade.

In 1988, the U.S. economy resumed its steady growth. The value of metals produced from U.S. ores rose 40 percent to \$10 billion, and the value of industrial metals rose 6 percent to \$20 billion. Increasing economic activity finally stimulated prices of most metals. U.S. coal production rose 5 percent to 870 Mt (960 million st). In 1988, gold production was up 33 percent to 205 t (6.6 million oz).

At the 1988 SME Annual Meeting in Phoenix, AZ, SME President Haydn Murray echoed the optimism that was building in the mining industry. Murray said, “With gold leading the way, the metals are in a growth mode. Copper and lead prices are on the rise and one can feel again an optimism in the metals sector of the mining industry.” In addition, he pointed out that coal production

continues to increase. Murray warned, however, that the minerals industry faces some big challenges in the next few years. “Among other things, we need to overcome high labor and environmental costs,” he said. We can do this by “developing innovative and improved mining and processing techniques,” he said.

Robert Murray became the 1989 SME president at the 1989 SME Annual Meeting in Las Vegas. Murray noted that, in the world marketplace, the “U.S. is less competitive with foreign commodities and goods.” Murray blamed “overregulation and overtaxation, federal deficit spending and lack of corporate loyalty by many businesses for their employees” for much of the problems facing the mining industry.

Worldwide economic growth and capital spending led to tight metal markets in 1989. The U.S. economy grew steadily, and the value of metals produced from U.S. ores rose 14 percent to \$11.6 billion in 1989. In 1989, gold production was up 19 percent to 233 t (7.5 million oz). Because of the economic growth, the U.S. unemployment rate dropped to 5.3 percent.

The SME Annual Review for 1989 (*Mining Engineering*, May 1990) summed up the decade for the mining industry by stating the following: “The U.S. mining industry finished the traumatic 1980s with strong economic performance. The U.S. mining companies that survived the decade had weathered economic changes that, at one point, reduced industry employment by 40 percent, drove oil companies to divest or liquidate mineral companies and led to substantial write-offs of reserves.” ■

The 1990s — politics and the environment

At the beginning of the 1990s, Communism fell and signaled the end of the Cold War. The world rejoiced but also watched and waited to see how those countries would restructure themselves.

The 1990 SME Annual Meeting was held at the Salt Palace Center in Salt Lake City, UT. The keynote session featured Alistair Frame, chairman of RTZ; Paul Queneau, professor of metallurgy at the University of Utah; and TS Ary, director of the U.S. Bureau of Mines. The SME Board of Directors voted to hire a Manager of Public Information and Education to be the GEM Program coordinator. This person was to collect and disseminate information that could be used by individual members and Local

Sections to interface with government personnel and the general public.

Roshan Bhappu, president of Mountain States R&D International, became 1990 SME President. He was optimistic in his March interview with *Mining Engineering* managing editor, Tim O’Neil. “The world mining industry is in a relatively healthy state, with higher than expected metal prices and production often at full capacity,” Bhappu said. “There is considerable optimism that this favorable state of affairs will continue at least for the next two or three years.”

Georgene Renner,
Senior Editor

On SME he observed, “Financially, SME is healthy thanks to judicious cost cutting programs initiated by the SME board and SME staff ... However, we dare not lose sight that we belong to a cyclic industry.”

An industry salary survey observed that after several years of a depressed market, the base-metals industry began hiring due to strength in the prices of copper, lead, zinc and molybdenum. The expanding precious-metals industry, which for the most part escaped the depressed markets of the mid-1980s, preceded the base metal companies in the hiring of engineers and operations personnel. The coal industry, however, did not rebound much from the cutbacks of the early 1980s. And the uranium industry remained nearly nonexistent in the United States.

There was a scarcity of mining and metallurgical engineers with two to six or seven years of experience, since few were hired out of the mining schools during those years. And many companies had difficulty meeting their staffing needs. Senior level engineering and management employees were also scarce, since many had found new career paths.

The annual mining industry compensation survey by the Denver-based Mountain States Employers Council (MSEC) showed that the typical employee in the mining industry was projected to receive an increase of 3.9 percent to base pay in 1990. According to MSEC, the percentage increase to base pay has continued to decline since 1980.

The buildup of U.S. military forces in the Persian Gulf area focused greater attention not only on petroleum but also on other strategic materials. Exploration for nonfuel minerals had declined since 1988, but 1990 expenditures were significantly greater. The United States became only the second country (after China) to produce more than 900 Mt (1 billion st) of coal in a single year. U.S. production of bituminous and subbituminous coal, lignite and anthracite totaled 933.5 Mt (1.029 billion st) in 1990, 5 percent more than in 1989.

As 1990 unfolded, U.S. savings and loan problems spread to the commercial banking system, leading to the failure of several major U.S. commercial banks. Gold was at the center of the action in 1990. So SME held GOLDtech 4 in Reno, NV, the fourth in a series of gold technology meetings. Feature articles in *ME* in 1990 highlighted the health hazards of crystalline silica, the growing importance of mining software, Indonesian coal and the need for due diligence. The popular article by H. Lyn Bourne on mining royalties, “What It’s Worth” was published in the July issue.

SME held its annual meeting in Denver, CO in conjunction with the Colorado Mining Association and AIME. Small gains in student membership were posted for the first time in 10 years, but corporate membership continued to decline.

Mining Engineering celebrated its 50th anniversary as SME’s official publication in 1999.



The incoming SME President was Ted H. Eyde, president of GSA Resources in Tucson, AZ. He talked about the prevalence of “bad science” and how it affects the minerals industry. “Few of the politicians and government administrators responsible for health, environmental and land-use policies recognize the strategic importance of a healthy and productive minerals industry. And, worse still, their decision have been profoundly influenced by a relatively small core of environmental zealots.” His first priority “is for SME to take an active role within the guidelines of its policy on public issues, to take positions on government policies that will affect the orderly development and production of the earth’s mineral resources.”

M. Thompson Hendricks became executive director of SME on July 1 when Claude Crowley retired after 22 years of service. Marianne Snedeker, manager of Book Publishing and former manager of Publications, retired after 31 years of service. Carl Haywood became manager of Public Information and Education.

Major changes to the Mining Law of 1872 were proposed by Rep. Nick Joe Rahall (D-WV) in the House and by Sen. Dale Bumpers (D-AR) in the Senate. The Colorado Mining Association and the American Mining Congress, among others, mounted a challenge to the proposed new regulations.

Environmental regulations were becoming a decisive factor for many minerals industry operations. An abundance of federal, state and local environmental laws and regulations and complex new legislation and rule-making confronted ongoing mineral operations. Acronyms and initials like RCRA, CERCLA, SARA and EIS became as familiar as reserves, tons, grades and recoveries. This created a new category of professional employees — environmental scientists and engineers. An environmental consulting industry of substantial proportions developed. Mining schools introduced environmental course work, but these programs had yet to supply a significant number of graduates. A National Energy Strategy was announced. It was designed to encourage domestic production of fossil fuels and nuclear and renewable energy and to stimulate efficiencies in use. The U.S. Senate defeated a one-year moratorium on mining claim patents but approved a nine-month moratorium on the patenting of 27 oil-shale claims.

Douglas Yearley, chairman of the board and chief executive officer of Phelps Dodge, gave the Welcoming Luncheon address at SME’s 1992 Annual Meeting in Phoenix, AZ. Meeting symposia focused on health and safety and sulfur exploration. Mark Anderson, president of Columbia Resources, took over the helm as president of SME in 1992 and expressed his optimism about the future of mining in the United States. He also predicted that, “The large, diversified companies will be as dominant in the year 2015 as they are now. However, I believe we

SME presidents 1990-1994 — from left to right: Roshan B. Bhappu, Ted H. Eyde, Mark A. Anderson, Donald W. Gentry and Robert C. Freas.



will see the continuing emergence of smaller companies that are niche players. These smaller companies will be risk takers. Larger companies have always relied on contributions of smaller companies.”

Roshan Bhappu, 1990 SME President, became president of AIME.

A federal judge stopped the U.S. Department of Energy (DOE) from shipping nuclear waste to the Waste Isolation Pilot Plant near Carlsbad, NM, leaving it up to Congress to complete the land transfer from the Department of the Interior to the DOE.

The second edition of *SME Mining Engineering Handbook*, edited by Howard Hartman, was published in August. The two-volume book was not a revision, but virtually an entirely new book. Two-hundred and fifty authors contributed time and effort to SME’s flagship publication.

Having been effectively closed to foreign investors for decades, former Soviet republics began trying to attract overseas investment. The objective was to create mineral joint ventures. But despite the many efforts to improve the investment environment, international mining companies were slow to respond. Most companies adopted a cautious approach. Unresolved issues of property rights in Eastern Europe and the former Soviet Union proved to be a deterrent to grassroots exploration by foreign companies. Projects by Newmont Mining at Muruntau, Uzbekistan and by Goldbelt Resources in Kazakhstan, applied new technology to established mining projects in return for a share of production.

According to the Metals Economics Group, planned 1992 exploration expenditures were down by about 5 percent. Geographically, the leading exploration target was the United States with 21 percent of the expenditures, followed by Australia, Canada, Latin America, South Africa and the western Pacific.

SME meetings in 1993 included the Annual Meeting in Reno, NV, and the Milton E. Wadsworth Symposium on hydrometallurgy in Salt Lake City, UT. The Milton E. Wadsworth Extractive Metallurgy Award was approved by the SME Board of Directors.

The SME Long-Range Strategic Planning Committee, led by 1993 SME President Donald Gentry, met for the first time in Atlanta, GA. Gentry, professor and head of the Mining Engineering Department at the Colorado School of Mines, observed that SME “...must decide where to concentrate (its) attention. Plans that attempt to make everyone happy result in decisions that please no one. We must concentrate our limited resources and time on

achieving a few vitally important goals.” He viewed the committee as “the most important activity under way within SME.” The committee’s task was to assess SME’s strengths and weaknesses and produce a strategic plan for the future. The plan was published in its final form in the November issue of *Mining Engineering*.

For the third time, Sen. Dale Bumpers (D-AR) and Rep. Nick Rahall (D-WV) introduced legislation to scrap the Mining Law of 1872.

RTZ, through its Kennecott subsidiary, moved into the U.S. coal business by purchasing Nerco, with its three Powder River Basin in Wyoming mines. RTZ also purchased Sun Company’s Cordero Mining, also in the Powder River Basin.

In early April, copper prices sank to a four-and-a-half year low. The unofficial London Metal Exchange spot price dropped to 94.35 cents/lb. Despite the weak demand for copper, the U.S. market continued to be strong. And Magma Copper’s board gave the go-ahead to develop the Kalamazoo copper orebody near San Manuel, AZ.

Federal agencies began investigating Galactic Resources, the Canadian owners of the Summitville Mine in the San Juan Mountains of Colorado. Cyanide leakage from the mine contaminated the Alamosa and Rio Grande rivers.

Latin America opened its doors to foreign investors and sparked major activity by junior and mid-sized companies. However, a Gold Institute report indicated that the exploration efforts came at the expense of exploration in the United States and Canada.

Mining giants Cyprus Minerals and Amax merged into a \$5-billion company called Cyprus-Amax. Milton Ward became co-chairman, president and chief executive officer of the new company. Alan Born, became co-chairman and chairman of the executive committee.

Tom Hendricks resigned his position as Executive Director of SME. He was temporarily replaced by interim director, William Shepard.

Gold and silver production in Nevada set records even though no mines opened during the year.

A survey of SME members revealed some interesting statistics about the organization. Nearly 70 percent of the 18,835 members were owners or managers of their company or organization.

- 34.8 percent were management
- 23.8 percent were mining engineers
- 22.7 percent were geologists
- 19.2 percent were consultants

- 36.6 percent were in ferrous metals
- 28.3 percent were in precious metals
- The average member was 40-49 years old.
- 95.9 percent had a four-year college degree or higher.
- Nearly 70 percent had belonged to SME for more than 10 years;
- 32 percent had been members for more than 20 years.

Philip Hocker of the Mineral Policy Center and Russell Babcock of Kennecott Corp. were speakers at the Welcoming Luncheon at the SME Annual Meeting in Albuquerque, NM. They spoke to more than 500 attendees. Hocker joined Sen. Larry Craig (R-ID), Robert Armstrong, assistant secretary to the Department of the Interior and Milton Ward, chairman of Cyprus-Amax at the meeting's Keynote session.

Gary Howell, formerly with the American Association of Petroleum Geologists, was chosen as SME's new executive director and Robert C. Freas became SME's president. Freas, who was senior vice president, sales and marketing, for Franklin Industrial Minerals, mentioned that his first priority as president was to enhance the value of membership in SME. He said, "It is incumbent upon us to define our members' needs and requirements."

Interior Secretary Bruce Babbitt established the National Biological Survey to determine endangered species and compile ecology-related information. Vice President Al Gore put the U.S. Bureau of Mines (USBM) under scrutiny aimed at reducing the size of the federal government. The USBM budget was cut by \$19.7 million. Reha Graham was chosen to head the U.S. Bureau of Mines. And mining-law reform legislation died in the 103rd Congress, each side blaming the other for its demise.

Several Indonesian coal projects moved into production stage. They included Kideco Jay Agung, Berau coal mine, PT Utah Indonesia, PT Chung Hua and Indominco and the Indonesian coal briquet program. Newmont Mining and Newmont Gold combined assets and operations and finalized the plans for the Zarafshan-Newmont joint venture gold-project in Uzbekistan. The board of directors of Santa Fe Pacific Corp. approved the spinoff its subsidiary, Santa Fe Pacific Gold.

SME published the sixth edition of *Industrial Minerals and Rocks* with Donald Carr as senior editor. ISO 9000, a system of quality standards that originated in Europe, gained ground in the industrial minerals industry. And the SME Industrial Minerals Division held a symposium on this topic in Nashville, TN.

The Channel Tunnel between Folkestone, England and Calais, France, was opened on May 8.

A recording-setting cold January in the eastern United

States made coal transportation impossible, resulting in massive rolling brownouts. Coal producers in Colorado and Wyoming broke production records as eastern utilities moved ahead with plans to meet the Clean Air Act standards. And Powder River Basin coal was the subject a special report in the August issue of ME.

Raja Ramani, head of the Department of Mineral Engineering at Penn State, was inaugurated as 1995 SME President at the Annual Meeting in Denver, CO. In a visionary statement, Ramani noted that "It is important for the mining industry to join the current debate on sustainable development. And the mining industry must be a major player in developing the minerals policies and programs that will emanate from the debate." He also observed that "there is no future for SME without financial stability. SME must enhance its international presence and

involvement." For the first time, two candidates for SME President (1997), Michael Karmis and Richard Klimpel, were presented to the membership for a direct vote. With the departure of Carl Haywood, SME's GEM program was restructured and moved back into the membership department.

The American Mining Congress and the National Coal Association (NCA) merged to form the National Mining Association (NMA). Richard Lawson, NCA president, headed the new organization.

Caterpillar donated 10,000 copies of its educational video, *Common Ground*, to SME for distribution at the National Science Teachers Association conventions. *Common Ground* is about responsible stewardship of the environment and the importance of the minerals in it.

Another attempt was made in the U.S. Senate to reform the Mining Law of 1872, this time supported by the NMA. The U.S. Bureau of Mines closed facilities in Anchorage, AK; Denver, CO, Reno, NV and Spokane, WA.

Rising molybdenum prices spurred Cyprus-Amax to reopen the Climax Mine in Colorado. The mine had been closed since 1987.

SME hosted the International Mineral Processing Congress in San Francisco. It was the first time since 1964 that the congress was held in the United States.

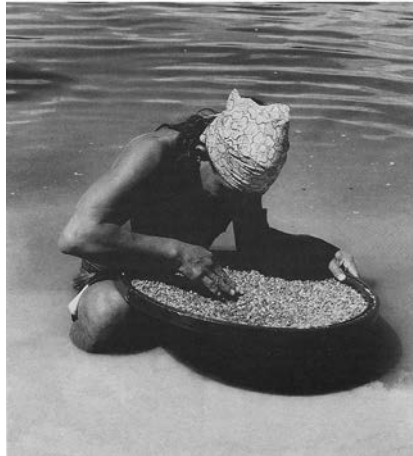
Drilling results at Voisey's Bay significantly expanded the scale of the nickel-copper deposit. Inco signed an agreement with Diamond Fields Resources, owner of the deposit, to acquire an additional 25 percent interest in the property.

In September, SME unveiled its home page on the World Wide Web.

Amax Coal sent layoff notices to all 169 workers at its Delta Mine near Marion, IL. Low coal prices, environmental laws and the deregulation of utilities were blamed. Cyprus Amax also closed its Empire Mine near Craig, CO.

The value of processed materials of nonfuel mineral

John Baz-Dresch won second place in the black-and-white division of the 1998 SME photo contest. The contest was favored among SME members during most of the 1990s.



SME presidents 1995-1999 — from left to right: Raja V. Ramani, John F. Burst, Richard R. Klimpel, Ihor A. Kunasz and James W. Boyd.



origin produced in the United States in 1995 was approximately \$395 billion, an increase over 1994 of almost 10 percent. And the coal industry produced a near-record output.

John F. Burst, a principal in IMMI Consulting Group, became SME president at the 1996 annual meeting in Phoenix, AZ. As president, he was determined to focus on membership development programs and the funding of the SME Foundation, especially for GEM activities. Environmental management practices were the highlight of the meeting. Ihor Kunasz and Ponisseril Somasundaran were the candidates nominated to run for SME President in 1998.

The January issue of *Mining Engineering* unveiled the magazine's updated design. And two new columns appeared as a result of the survey of members done in 1995: a bimonthly column on minerals economics and financing by Douglas Silver and a quarterly column on risk assessment as it pertains to mining by the Control Risks Group.

S. Komar Kawatra, professor at Michigan Technological University, became the third person to serve as editor-in-chief of the *Minerals and Metallurgical Processing* journal. He was faced with declining subscriptions and escalating costs.

The U.S. Bureau of Mines was closed. Many of its functions and 600 of its employees were absorbed by other federal agencies, such as the Department of Energy, the U.S. Geological Survey and the BLM.

The Sumitomo \$1.8-billion copper-trading scandal on the London Metal Exchange put traders, copper producers and commodities exchanges in an uproar.

Bre-X Minerals sought a heavyweight mining partner to help develop its Busang gold deposit in Indonesia. David Walsh, president and chief executive officer of Bre-X, believed the discovery to be one of the richest gold deposits in the world. Freeport-McMoRan was eventually chosen to develop the site.

President Bill Clinton used the 1906 Antiquities Act to create the Grand Staircase-Escalante National Monument. The area became off-limits to a major coal mine planned by Andalex Resources and spurred a flurry of lawsuits for the rest of the decade.

SME held its 1997 Annual Meeting in Denver, CO and unveiled its new Environmental Division. Attendance was the highest since the Salt Lake City meeting in 1990. Richard Klimpel, president of RK Associates, became SME president. He noted that "Some very positive trends are occurring with SME. One of these was the name change

several years ago. There is now an increased awareness that SME is a society for all professionals involved with the minerals industry." He also emphasized that the primary role of SME is "technology transfer in its broadest sense. All other society activities pale in comparison to this role."

At the welcoming luncheon, Giovanni Toniatti, National Secretary of Mines and Metallurgy in Brazil, told attendees how the Brazilian mining code was changed to encourage outside investment. Jack Thompson of Homestake Mining spoke at the Environmental Division breakfast. James W. Boyd and Brij M. Moudgil were chosen to be candidates for SME President in 1999. Donald E. Ranta and Nikhil C. Trivedi were chosen as candidates for 2000. And George W. Luxbacher and Arthur A. Schweizer were the nominees for the 1998-2001 vice president-finance.

The six-month bidding war over who would own Santa Fe Pacific Gold ended when the company's board of directors accepted Newmont Mining's \$2.5-billion stock swap bid. The merger created North America's largest gold company and the world's second largest. Newmont's bid beat out Homestake Mining's offer.

On March 17, Bre-X's chief geologist, Michael de Guzman, died in fall from a helicopter on route to a meeting with Freeport-McMoRan geologists. He was survived by \$30 million and four wives. On March 26, the Bre-X scandal broke when the Freeport geologists failed to find evidence of gold. "To date, analyses of these cores, which remain incomplete, indicate insignificant amounts of gold." This revelation halted trading of Bre-X shares on the Toronto Stock Exchange. Strathcona Minerals Services, the independent firm assessing Bre-X's gold claims in Busang, released its report May 5. It determined that there was virtually no gold in Busang — and that somebody committed fraud. The gold in the samples submitted by Bre-X had originated from a source other than the southeast zone of the Busang property.

Bre-X chief executive officer David Walsh headed for the Bahamas, where he died a year later. John Felderhof, head of exploration for Bre-X, took his own \$30 million and fled to the Cayman Islands. Forensic Investigative Associates (FIA), later hired by Bre-X, placed all blame for the gold-salting scam on de Guzman and his assistant, Cesar Puspos. FIA's report exonerated Bre-X senior executives. However, the Royal Canadian Mounted Police (RCMP) did mount a criminal investigation that spanned four jurisdictions: the Philippines, Indonesia, the Cayman Islands and the Bahamas. But witnesses — especially in Indonesia — were difficult to track down, and it was nearly

impossible to compel them to testify.

Workers completed the main tunnel at the Yucca Mountain site characterization project, a proposed high-level nuclear waste storage facility in Nevada. The 653-t (720-st) tunnel-boring machine set a world record for a machine its size by excavating 288 m (716 ft) in one week.

The Janet Annenberg Hooker Hall of Geology, Gems and Minerals at the Smithsonian Museum in Washington, DC, opened in September, nine years after initial fundraising began. It was mostly funded by private groups including \$1.7 million from 43 National Mining Association member companies.

Robert Druva retired from his position as staff liaison for the Professional Registration Committee (now the Professional Engineers Exam Committee). Raymond Lowrie stepped into the position in just in time to shepherd the committee through the many major changes to the exam mandated by the National Council of Examiners for Engineering and Surveying.

In 1998, the SME Annual Meeting moved east — to Orlando, FL. Ihor Kunasz, geologist and Soviet Union specialist for Cyprus Minerals, was elected president of SME. He was optimistic that the decline in metals prices would not continue for long. But he noted that the industry will undergo a major readjustment as a result. “Strategic mergers and alliances will continue to reduce costs, increase productivity and fine tune the product mix. The downturn in metal prices will result in even greater pressure to make short-term decisions. However, companies must adhere to long-term strategies.” The SME Nominating Committee chose J. Brent Hiskey and Ta M. Li as candidates for SME President in 2001.

The U.S. Senate indicated that it would reject the Kyoto global-warming treaty, citing its failure to mandate emissions restrictions for developing countries.

Gold prices hit their lowest point in 18 years falling

to \$9.09/g (\$282.75/oz). Gold producers planned to cut staff and slow production. Newmont Mining announced that it would lay off 500 employees. Homestake followed suit. Amax Gold was merged into Kinross Gold. Cominco closed its Glenbrook nickel smelter in Riddle, OR and left the nickel business.

The U.S. Mine Safety and Health Administration (MSHA) introduced a new strategy to combat black lung disease. The new rules required coal-mine operators to take more prompt corrective action once an overexposure was identified. Noncompliance would be based on a single, full-shift dust sample taken by MSHA inspectors. MSHA also proposed new health standards for diesel equipment used in underground mines.

Production at Ekati, Canada’s first diamond mine, began in October. The mine was a joint venture between manager and operator BHP Diamonds, Dia Met Minerals, Charles Fipke and Stuart Blusson. BHP Diamond was a part of BHP Minerals.

Billionaire Warren Buffet sparked a silver price rally when his investment company revealed that it had bought 4 kt (129.7 million oz) of silver. The price of silver rose more than 60 percent.

The Waste Isolation Pilot Plant in Carlsbad, NM received certification from the U.S. Environmental Protection Agency. The government was immediately sued by the Southwest Research and Information Center to halt any shipments of nuclear waste.

The U.S. Congress passed the “Iraq Liberation Act,” stating that the United States wants to remove Saddam Hussein from power and replace the government with a democratic institution.

The 1999 SME Annual Meeting returned to Denver, CO and James W. Boyd became the 1999 SME President. Boyd, president of the John T. Boyd Co., addressed the problem of SME’s still-shrinking membership. “Membership is my number one priority. We should identify the

companies having a low percentage of eligible members. It is possible that many of these leaders are not aware of SME. They may not understand the value of having employees belonging to the society.” Society membership was 14,880. SME presidential candidates chosen for 2002 were Bruce W. Cavender and Barbara A. Filas. However, at its Fall Meeting, the SME Board of Directors voted to return to a single-nominee election in 2004. The Robert M. Dreyer Award for outstanding achievement in economic geology was inaugurated by SME. Dreyer was a former chair of the Industrial Minerals Division and member of the board of directors.

SME’s Washington, D.C. local section celebrated its 80th anniversary. The section was founded in 1919 by Herbert Hoover, mining engineer and the section’s first chair.

Nevada was rated the top North

Because the U.S. mining industry was shrinking during the 1990s, SME made a commitment to grow its international membership.



American mine-investment region by Canada's Fraser Institute. Ontario was second. On May 3, the Dow Jones industrial average topped 11,000.

The first shipment of nuclear waste arrived safely at the Waste Isolation Pilot Plant near Carlsbad, NM. WIPP was originally scheduled to begin receiving waste in 1988.

Robert Friedland, the federal government and the state of Colorado began negotiating the \$150-million cost of cleaning up the Summitville Mine. Friedland was the former chief executive of Galactic Resources. The company operated the mine in 1990 when a toxic spill forced its closure. The Colorado attorney general eventually had to sue Friedland in civil court.

The 2000s — SME increases Internet presence

Hard times continued to plague the industry when the calendar rolled over to 2000. During 1999, the United States economy had grown vigorously, capping the longest economic expansion in United States history. However, the mining industry was not so fortunate. Commodity prices remained in a slump in the "new-economy" that was fueled by excitement and speculation about the power of the Internet during the infancy of the Information Age. Much of the investment money that once went to mining and exploration was now headed to the world of virtual gold mines.

SME President Donald E. Ranta implemented new technology into his plans for SME. His two major goals were new membership growth and to foster the establishment of the comprehensive Internet presence for the Society's technical information. His strategic priorities included enhancing the quality and quantity of publications, programs, meetings and short courses. "The Internet is the vehicle that will advance the priorities," he said.

SME suffered a loss in May of 2000 when then Executive Director Gary D. Howell died of a heart attack in his home. He had been the executive director of SME since 1994. He was 54 at the time of his death.

John Orologio served as interim executive director until February 2001. Paul Scheidig was named SME's executive director on Feb. 25, 2001.

In 2000, energy needs in the United States were being met with foreign oil and the mining industry continued its struggle with image problems.

The final year of President Bill Clinton's second term was tough on miners, big and small. Determined to leave a lasting environmental legacy, Clinton closed off large areas in Utah, Arizona and Montana to exploration. Using the 1906 Antiquities Act, he created numerous national monuments including the Grand Staircase-Escalante National Monument in Utah that halted plans for a large coal mine there.

All of these things, at times, seemed to be designed to curtail the industry. Add in the fact that environmental groups gained strength and passed along their thoughts on global warming, climate change and pollution via

The Mineral and Metallurgical Processing Division of SME inaugurated the Richard Klimpel scholarship. Klimpel, president of SME in 1997, died in November 1998.

Gold prices continued to slide hitting \$8.29/g (\$258.05/oz).

The budget bill for FY 2000 passed by the House included an amendment that would prohibit mountaintop-removal coal mining in West Virginia. Sen. Robert Byrd (D-WV) threatened to filibuster the bill.

The Y2K crisis worries began early in 1999 and escalated into major/minor hysteria by December. A peek into 2000 showed that all was well. And that the true millennium was still a year away. ■

the World Wide Web and there was little for the industry to cheer or smile about.

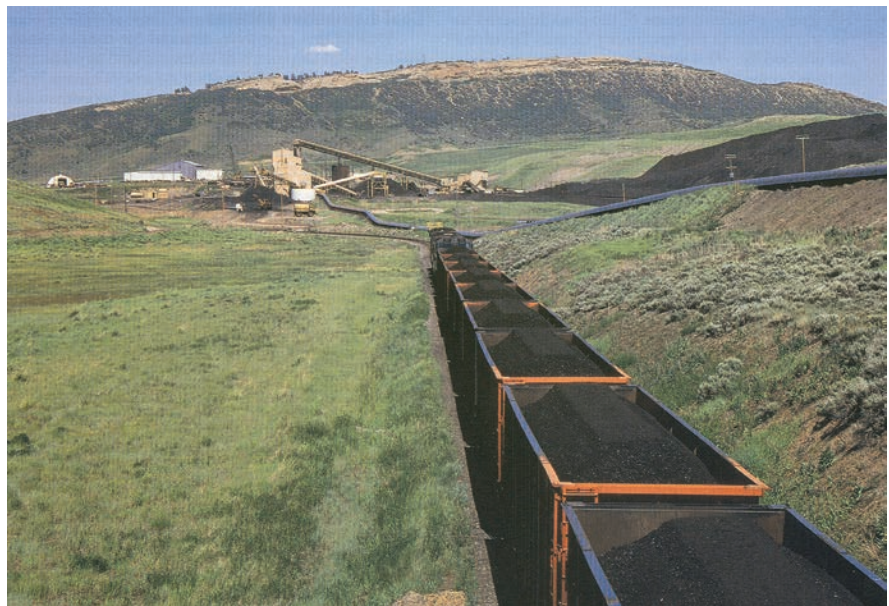
Outside of the industry, horrific accidents and damaging strip mining became the picture of mining for much of the general public. Because of the growing problems, many miners began to look to each other and to developing nations for new sources and new places to conduct business.

Mining companies continued to merge their resources to take on these challenges. These mergers began in the late 1990's and reached a peak in 2001. The mergers created mega mining companies in all areas. BHP and Billiton joined forces. Newmont Mining acquired Franco Nevada and Normandy Gold but could not catch up with Barrick, which acquired Homestake Mining. Teck and Cominco merged to form mining giant Teck-Cominco.

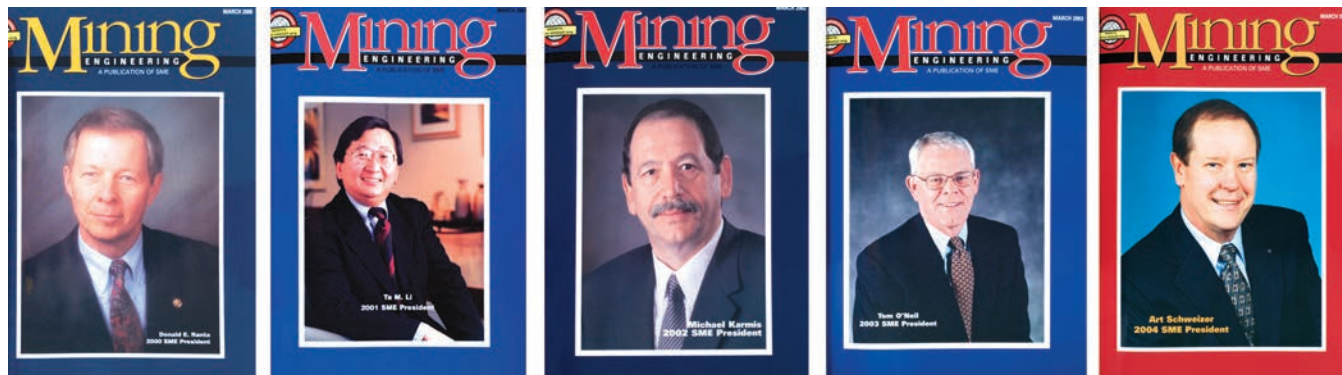
The trend has continued up to present day with friendly and hostile takeovers dominating headlines as the title of "world's largest producer" is traded among the merged entities. The combined resources allowed miners to expand. With global expansion came new opportunity and new obstacles.

William M. Gleason,
Associate Editor

The 2000s started out rough for the industry. But the industry began to pick up in 2004. And SME saw improvements, both financially and in membership. In 2006, the Society saw its first membership increase in many years.



SME presidents 2000-2004 — from left to right: Donald E. Ranta, Ta M. Li, Michael Karmis, Tom O'Neil and Art Schweizer.



Along with major projects in all corners of the world, the issue of sustainability grew to become one of the most important topics in the industry.

2001 SME President Ta M. Li said, "The industry is vibrant and resilient. But these days I wonder how much longer we can or will put up with those elements that strive to shut us down." His goals for SME included implementing the strategic plan that was completed in 1992. And his focus was on communications and the Internet, globalization efforts and membership development. A common denominator for these areas was to give people a better reason to join SME. In 2001, 13,089 people were members of SME.

An administration change in Washington D.C. that followed months long counting and recounting of votes in Florida ushered in new hopes for the industry. But shortly after George W. Bush took office, the entire world was changed by the terrorists attacks on New York City and Washington D.C. on Sept. 11, 2001.

In addition to the immeasurable loss of life, The New York Stock exchange suffered its biggest single day loss in history and the biggest three-day loss since the Depression of the 1920s. As is often the case in times of global crisis, gold was one of the precious metal stocks that went up in value.

By March 2001, shrinking global markets, reduced consumer spending, declines in domestic manufacturing and industrial output ended the longest economic expansion in United States' history and pushed the U.S. economy into its first recession in a decade. The recession led to large reductions in the domestic production of processed mineral materials. Some of most significant declines were suffered by aluminum, copper and steel producers. They faced strong foreign competition, higher energy costs and lower prices for their products.

The down cycle that stretched into the first part of the new century forced the industry to turn to technology for its own livelihood. From those times of struggle came advances that made the industry more efficient in all areas of operations. The biggest leaps forward came in the form of communication systems and global positioning systems. Advances in safety and heavy equipment also allowed for companies to go to places that had been unreachable before.

"The global, economic, technological, social and politi-

cal change in the past two decades of the 20th Century resulted in the emergence of a restructured minerals industry," said 2002 SME President Michael Karmis. He focused his presidential energies on making SME the leading source for public information and sound, technical and credible information to those involved in public policy. "The industry is now based on new cost-cutting philosophy; utilization of modern technology; productivity gains rather than production tonnages; diversification of mineral markets and globalization of exploration, mining and processing. Quantity of tons used to be the focus, now the focus is on remaining competitive by lowering per-unit production costs as much as possible," he said.

Domestic mining remained in the doldrums in the first part of 2002, but things were starting to turn slowly. The events of Sept. 11, 2001 helped some see the need for more energy independence. Because of that, coal would once again become a major energy resource.

By 2003, the coal rush was on. In America, the thirst for energy was rising as the Information Age came to include computers, cell phones, digital cameras and numerous other electronic devices. Globally, an incredible boom in China and India helped not only the coal industry but would eventually lead to a surge in the metals market as well.

In December of 2003, gold broke the US\$12.86/g (\$400/oz.) mark. And it wasn't just gold that was doing well. Silver hit a six-year high in 2003. Copper reached its highest level since 1997 and nickel reached its highest point in 14 years.

Tom O'Neil took over as SME president and said, "Although there is no shortage of problems or challenges facing mining — there never has been — mining remains an essential business with great opportunity." As the incoming president, O'Neil made it his responsibility to address, among other things, the long, slow decline in membership that SME had been struggling with in previous years. SME membership dropped to 11,090.

Industrywide, globalization began to pay off for the industry as a weak U.S. dollar, strong Euro, political tension in the Middle East and the war in Iraq all played a part in the rise of the commodity prices. But none of those factors affected the industry quite like the growth in China. With more than 1.6 billion people, China boasts the fourth largest economy in the world. China's energy

consumption is expected to grow in the future, and it could possibly double by 2020. Its thirst for materials is also expected to grow.

By 2004, the industry was out of its doldrums and moving into an upswing. SME felt the effects of the upswing. 2004 President Art Schweizer said, "The state of the industry is stronger in 2004 than it has been in the past few years. The industry is ahead of the curve when it comes to globalization. With rising prices the industry should flourish." To help things move along, his goals included creating a solid business plan to continue initiatives started by previous presidents and to develop relationships with other prominent international mining organizations with the hope of forming a global mining society.

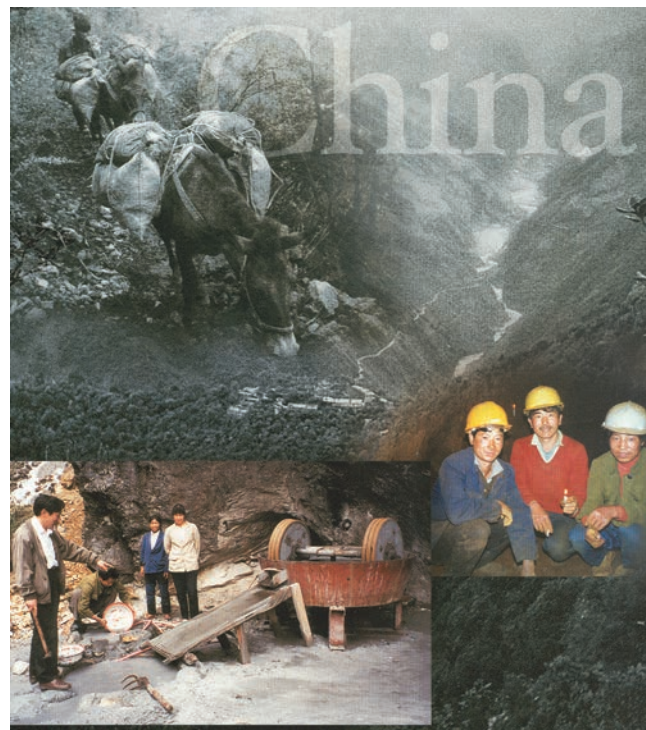
Schweizer's business plan was designed to streamline the organization by providing the services sought by membership and by eliminating unnecessary services. He wanted to make sure SME would business in the same manner as other successful businesses. Schweizer also kept electronic publishing and the use of the Internet high on his priority list. It was move that has helped SME provide more services with less overhead costs.

However, with the return of strong prices came new challenges. Among those challenges was accountability required of the industry. Terms like "social license to operate" and "sustainable development," worked their way into the industry's lexicon.

SME found some stabilization in 2004 as well when David A. Kanagy was hired at the Society's new executive director. Kanagy joined SME after six years the executive director of the Iron and Steel Society, which is also a member society of AIME.

In 2005, the industry continued to flourish in almost all areas. Improved prices led companies to open new mines and reevaluate development opportunities at po-

China's incredible appetite for minerals is one of the driving forces behind the mining industry's turnaround that began around 2004.



SME presidents 2005-2006 — Barbara A. Filas and Brij M. Moudgil.



tential mines while increasing production at existing mines around the world. However, government restrictions in the United States continued to make things difficult for miners.

SME elected its first female president, Barbara A. Filas. Membership declines and a new face of the industry were pressing topics for her to deal with. "If SME intends to maintain or grow its position in this marketplace we must learn from what our industry is doing. SME must become as agile and efficient as our industry is to serve the mining professionals of the future," she said.

In 2006, the image of mining in America took a hit when the Sago Mine accident that claimed the lives of a dozen coal miners earned national headlines.

As the war in Iraq stretched into a fourth year, the search for alternative energy sources was heated. From the oil sands in Canada to oil shale deposits in Colorado, Wyoming and Utah, America explored its options.

Globally, interest in uranium rose sharply as nuclear power again became a viable option.

2006 SME President Brij M. Moudgil said, "We are at a threshold where a few well thought out, bold initiatives, implementation of strategic plan elements and a bit of luck could have a significantly positive impact on SME. "My challenge is to ensure successful and timely implementation of the strategic plan and to build relationships with like-minded international societies."

Also in 2006, SME instituted its Registered Member category. The Society is able to offer this significant program to members because it has become a Recognized Overseas Professional Organization. Now, those who qualify can obtain this membership upgrade through SME. Applicants must first meet strict educational and professional standards and must undergo a vetting process by the Admissions Committee.

In 2006, SME purchased the assets of the American Underground Construction Association. It became the Underground Construction Association of SME. For the first time in many years, SME saw positive membership growth, swelling to 11,250 members.

Entering the second half of the first decade of the new century, SME's 50th, the industry is flourishing, but not without concerns for the future. An aging workforce is nearing retirement and there are not enough qualified young people ready to step into the void.

Political unrest in many parts of the world continues to challenge those who mine in those countries and the ever-present reality that things can change in the hurry will always be a fact of life for the industry and those who live with it. Just as has been the case for the past 50 years. ■

From *Diamond Sutra* to *Mining Engineering* — a history of *Mining Engineering*

The earliest dated printed book known is the *Diamond Sutra*, printed in China in 868 A.D. However, it is suspected that book printing may have occurred long before this date. In 1041, movable clay type was first invented in China. Johann Gutenberg invented the printing press with replaceable wooden or metal letters in 1436. It was completed by 1440.

Fast forward to 1700 when the first magazines began appearing as soapboxes for essays, satire or political/religious viewpoints. Featuring tiny print and no illustrations, these early black and white magazines reached a limited literate population - mostly the elite and upper class. With a postal delivery service in its infancy and a limited educated audience, these early magazines were not widely distributed or well known. But they were highly influential tools for those with the means and a message.

The first English language magazine was *Review*, published in London in 1704. It started a flurry of new British publications. Beginning in 1741, Colonial Americans soon established their own magazines in the same style. By 1825, there were fewer than 100 magazines in the United States, but by 1850, the number exceeded 600 and magazines were soon solidly established as a mass medium.

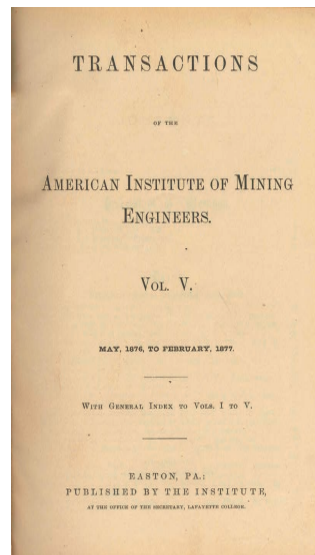
Mining industry begins publishing

In the spring of 1871, the seeds of what would give birth to *Mining Engineering* were already being planted in Wilkes-Barre, PA. Three coal mining engineers declared their intentions to form a mining and metallurgy society and begin the periodical publication of essays or papers for the interchange of ideas and information within the mining business community.

They successfully organized the American Institute of Mining Engineers (AIME) - the parent organization of today's SME. The new organization proceeded to publish its first volume of *AIME Transactions* within the next two years.

Papers appeared in the new *AIME Bulletin*, the organization's first monthly periodical magazine, in 1905.

And, as is the case today, the magazine was delivered monthly to each member as a member benefit. The organization was still small, with relatively few members,



and the new magazine had limited distribution. But all that was about to change.

Magazine and printing technology moves forward

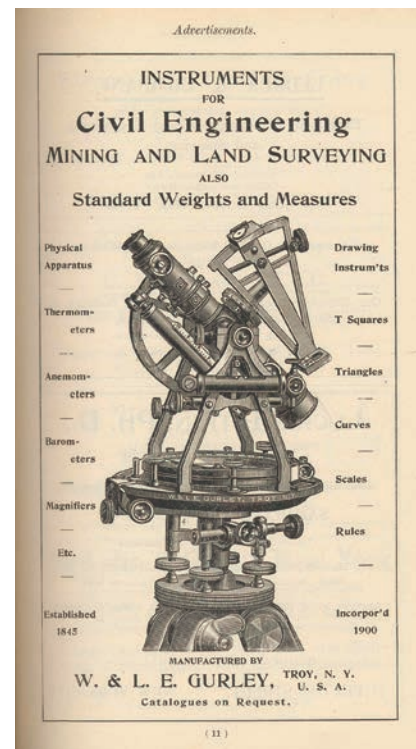
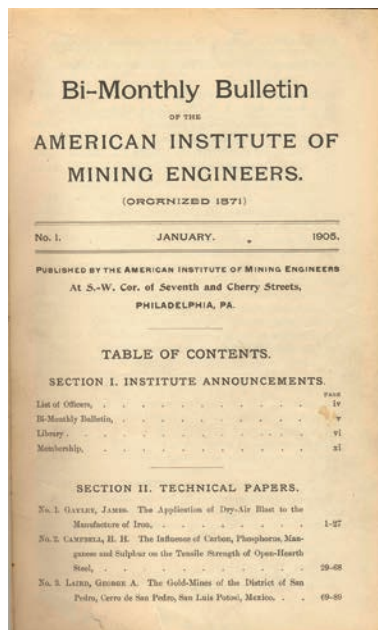
Worldwide technological advancements in typology, printing and distribution changed everything during the turn of the 20th century. Presses could now push through three times the volume of paper to publish to a public that was eager to read and eager to learn. The sharing of ideas and knowledge was

now available to anyone, anywhere.

As AIME's membership grew, the organization's publication printing increased to meet the needs of mining professionals everywhere. They increasingly relied on the knowledge and technical skills these publications provided. As magazines passed hands and new members joined, the industry came to know AIME and the AIME Bulletin as the leading information source for the many mining disciplines and applications worldwide.

Print advertising moves products and services

At the same time, large-scale distribution of goods was made possible. New railroads and new roads were quickly developing



Johanna McGinnis,
Media Manager

across the continents worldwide. The invention of plate glass windows gave birth to storefront displays. People began enjoying the role of consumer – both at home and in the workplace - and began comparing products and services in everyday life, to make educated, informed buying decisions.

With great improvements in printing quality and distribution to the farthest corners of the world, advertising in magazines gave suppliers of products and services, for the first time in history, a way to reach masses of buyers with little effort and at a greatly reduced cost.

It was the department stores that first turned their attention to the magazine to bring their advertising to the masses with glossy, colorful magazine ads. Advertising agencies began turning up everywhere, looking for magazine incentives and information to document back to their clients. Graphics began using editorial content and advertising-type graphics to gain readership. Slogans and color reshaped the look and feel of ads, bringing the message closer to the reader and buyer. Not until advertising did stories continue at the back of the magazine.

Advertising builds companies and AIME

Soon there was a growing interest in all things magazine. This interest not only involved consumer publications, but business magazines also found their audiences and successes, supplying information and products and services to industries everywhere.

This timing was good for AIME. Advertising pages in the AIME Bulletin made it possible to offset the cost of producing the society's magazines. This allowed for more investment back into the membership services to fund the growing organization. It was a winning combination and a formula still in play today.

In the January 1911 issue of the Bulletin, there were 27 pages of advertising. A variety of mining products and services were suddenly available and within reach of mining professionals everywhere. Publishing became a huge success for the organization. And members were enthusiastic about the new product and service information provided to them

on a regular basis to help them run their businesses.

Evolution to Mining Engineering Magazine

In October 1919, the *AIME Bulletin* was succeeded by



Mining and Metallurgy. This was an upgraded periodical magazine and, like its predecessor, sent to every member as a member benefit.

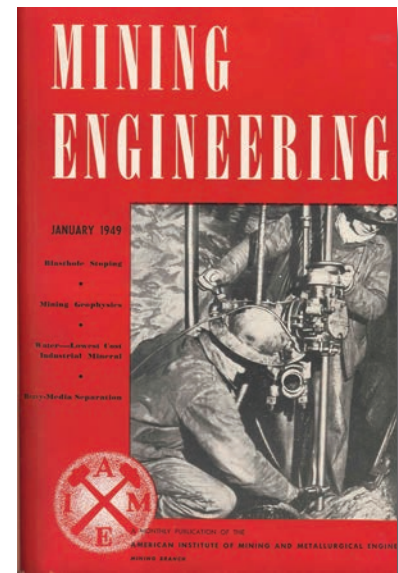
The size of the publication was changed to accommodate standard advertising plates. The general design was also improved to give more appeal to advertisers. The editorial content was to consist largely of specially written articles that would not be published in *Transactions*. The new publication would give members information, at short intervals, about the organization's activity and news that would be of interest to all AIME members, regardless of their specific professional field.

In 1937, AIME published several periodicals, each based on an industry segment of the society. A selection of papers appeared in the monthly *Mining Technology*, the official publication of AIME.

As the Society and the industry grew, major changes were coming about at AIME. A major reorganization resulted and in 1949, *Mining and Metallurgy* evolved into three separate journals, one of which was named *Mining Engineering*.

In 1957, the organization created three separate semiautonomous "societies" within itself, allowing greater focus within each group on their particular sector of the industry. SME – Society of Mining Engineers – was one of the groups. *Mining Engineering* was designated the official journal of SME.

In this February 2007 edition of *Mining Engineering*, special recognition is given to SME for reaching the 50-year milestone of being the premier society to mining professionals everywhere. *Mining Engineering* is proud to have traveled along with SME over the years and we are proud to be SME. ■



Mining Engineering's first edition, January 1949.



Mining Engineering's first ad in 1949 - inside front cover.



Celebrate

50 years

The Society for Mining, Metallurgy, and Exploration, Inc.

~ **Celebrates 50 years** ~

as a

Member Society of AIME

1957-2007

SME will mark its 50-year Anniversary with a Gala Dinner Celebration

Sunday, February 25, 2007

7:00 PM

Hyatt Regency Hotel – Denver, Colorado

This special event will be held in conjunction with the 2007 SME Annual Meeting & Exhibit.
The SME Foundation will host this historic event.

This formal dinner will include;

A Four-course Meal ~ Commemorative Champagne Glasses ~ Collectable Memento
Live Band ~ Recollection display from 50 years of serving the minerals industry.

SPONSORSHIP OPPORTUNITIES are available for this unique event. For more information contact:
SME, Meetings Dept., meetings@smenet.org, 800-763-3132, 303-973-9550.