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# MINING ENGINEERING

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*1978 SME-AIME President Robert S. Shoemaker*

# An Interview With 1978 SME President Robert S. Shoemaker



"The real mineral shortage in the US is going to be caused by a shortage of places to mine the minerals," says the new SME-AIME president. Mr. Shoemaker is manager of metallurgy, Mining and Metals Division, Bechtel Corp.

**Briefly, can you relate how you got into the minerals industry and some of your experiences as an executive, engineer, and administrator? Also would you tell ME about your affiliation with the Society of Mining Engineers of AIME?**

Roseburg, Ore., was where I was born and raised. It was, and still is a lumbering town; it couldn't have been any farther from mining. Upon graduation from high school, I turned 18 and, having already signed up with the Army Corps of Engineers, I was in the service eight days after my birthday. Four months later I was in New Guinea. As an amphibious engineer, I saw many of the Pacific and Philippine Islands, and ended up in Japan just a few days after the war was over. In later years, my work took me back to several of the places I had been during the war.

In 1946, I went to Oregon State, majoring in chemistry. My summers were spent as an underground miner in a baling-wire gold and copper mine mistakenly called the Champion (where my evenings were spent either shooting rats in the bunkhouse kitchen or helping run iron nail assays with a track spike) and with the USBM at Albany, Ore. In Albany, I was firmly hooked on the chemical end of metallurgy or the metallurgical end of chemistry. One bachelors' and two masters' degrees (the second M.S. from the University of Wisconsin in metallurgical engineering), a wife and three children later, Rush Spedden hired me to work at Union Carbide's new minerals research lab in Niagara Falls, N.Y.

That job was an education in itself, and I wish every young engineer could have shared in it. We researched and pilot-planted most of the ores and minerals in the book and many which weren't but which were made in Carbide's furnaces. The latter work led to assignments in Carbide's various ferroalloy plants, mostly to

operate plants to recover ferroalloys from slag. Next, I was transferred to Union Carbide Ore Co. in New York City. During the next five years I didn't spend much time at home. Mostly, I was in Norway having a great time with such things as manganese nodulizing kilns, a sinter plant, and all kinds of materials-handling problems at two ferroalloy plants and four quarries there. There was also a five-month stint in Western Australia, looking for manganese in the heart of what is now iron ore country, and other work in South America, Africa, England, Florida, and Virginia.

At the end of 1961, I had decided it was time to return to the western US. Bechtel sent a man to see me. They were interested in expanding the work of their Power and Industrial Division and were looking for metallurgists. The engineering business sounded intriguing and I decided to try it. Today, you often hear the old-timers accuse the new graduates of demanding a fancy office the first day they're out of school. I don't believe that. At that time, Bechtel gave me a stool and I shared a corner of a drafting table for the first week. The next week, I got a desk in the bull pen. That was the start of the most interesting 16 years of my life so far.

After two years, the Mining and Metals Division was formed; and with it I have been engaged in metallurgical plant design in almost every part of the world, serving as project engineer, chief metallurgical engineer, consulting metallurgist, and finally manager of metallurgy. Our major businesses have been the processing of copper, nickel, aluminum, and iron ores; but we have designed plants for the concentration of everything from bastnasite to vermiculite. My favorites, though, have always been precious metals plants.

You asked about my affiliation with SME-AIME. I joined AIME as a student member in 1952 and have been involved in some way every year since then. Both Car-

bide and Bechtel have supported me in all my AIME activities, including the monographs I have written with Frank McQuiston. They are both fine companies and have my sincere thanks.

**It's been said that the energy shortage is just a preview to the more pressing problem of a pending "minerals shortage." What are your recommendations for averting the latter?**

So far we have seen only temporary and localized energy shortages, and in my opinion they have no effect on the average American. Unfortunately, the average citizen realizes the impact only when a shortage has a marked and long-term effect on his pocketbook. So far, the government has been able to delay the effects of the energy shortage by artificially holding down the prices of our domestic fuels. I don't believe this practice can be continued much longer. In regard to the "minerals shortage," I believe a true scarcity of almost any mineral will be too far in the future for an ordinary mortal to predict. For example, 50 years ago the idea of transmitting voices through glass fibers or fishing with carbon fiber rods would have been thought impossible. I believe we will find substitutes for most minerals when we need them.

The real mineral shortage in the US is going to be caused by a shortage of places to mine the minerals. Presently, wilderness areas are far more popular than metal mines. Our legislators must somehow stop this steady withdrawal of public lands from multiple use and entry. We in the minerals industry must somehow get the idea of multiple land use across to the people of the US. If we don't, the US will soon be importing minerals at the same rate it imports petroleum. This may be only an academic question, however, because it appears that by the time we need to import our minerals, we will have spent all our money for importing fuels and will have nothing left to buy in the nonpetroleum minerals.

**How can SME-AIME members play a more vital role in bringing the mining industry's story to the general public and to the government?**

Our GEM committees and GEM activities are the best things that have happened to SME in the last several years. They enable the individual member to explain the impact of mining to the general public so that rational policy decisions can be made. Surprisingly, though, a number of Local Sections have not yet formed GEM committees or become involved in GEM activities. I cannot help contrasting this somewhat apathetic record with that of the outspoken Sierra Club members, each of whom, it seems, is highly vocal in defending things he believes in and attacking things he doesn't believe in. If each AIME member could generate only a small amount of the enthusiasm each environmentalist generates, I am sure the general public and our lawmakers would be far better informed than they are now as to the impact of the mineral industry on our country.

**An extended short course program has been developed for the SME-AIME Fall**

### **Meeting later this year. What do you view as the future continuing education needs of SME members?**

Short courses established and given by SME are one of the important ways SME can serve its members, and I would expect this service would be continued and expanded. I have hopes that in the future, SME will employ its own staff of educators who will work part-time for SME and part-time for an accredited university. With such a program, SME short courses may eventually be accredited and applied toward degrees or professional engineering registration requirements. I can further see these short courses being taken to the engineers themselves rather than being given in conjunction with the annual and fall meetings. After all, only a relatively small percentage of our members can attend these meetings. This is the reason we try to take our fall meeting to areas not usually served by the annual meeting.

The Society of Petroleum Engineers has an interesting audio-visual presentation, which SME could develop in the future. Unfortunately, we don't have the financial resources SPE has. We do, however, have a source of income which could be utilized for these purposes in the monies obtained from the Offshore Technology Conference. In 1977, this amounted to over \$80,000; and the total over the years has been over \$300,000. This money has, in effect, been used to subsidize SME expenses and thus hold down SME dues. Actually, it is past time we raised dues, since the purchasing power of 1978 dues is now less than the purchasing power before we raised dues in 1973. Holding down dues has done nothing but limit member services—and this is a trend which I believe must be reversed.

### **An SME Working Party is engaged in getting minerals engineering on the National Professional Engineering Registration Examinations. Would you give us your view on the importance of registration to SME-AIME members?**

Professional registration by engineers has been primarily emphasized in the past by civil engineers and land surveyors. The reason behind registration in these areas has been safety of public buildings and legal problems in subdivision of lands. As our laws have become more strict and as the number of statutes has proliferated, our government has attempted to control more and more facets of our lives. Registration of more and more engineers has become commonplace and necessary.

Another factor contributing to registration is our court system, which is continually broadening its definition of legal responsibility. Lawsuits increasingly involve everyone who could possibly have any connection with the design of equipment or of a process which is in some manner involved in an accident. One of these days, I am sure professional registration will be required by law for every engineer, no matter who he works for or what he does, just as barbers and saloonkeepers are required to be licensed.

While I'm not a proponent of more government regulation, I do believe licensing of engineers will tend to keep engineers up-to-date in their fields and thus promote better engineering. Some states are already discussing a "point system" for at-

tending short courses and technical conventions, writing papers, and so forth, which will count toward the maintenance of an engineer's registration. You can be sure that once government starts discussing something, it will take place whether we like it or not; and I would therefore suggest that all engineers had better be prepared to obtain professional registration. Fortunately, our educators are promoting this registration by urging graduating students to take the EIT examinations as soon as they get out of college.

### **Are there any new problems that you see within SME-AIME today?**

Our most important problem is growth. First, SME needs more members. It is amazing to me how many engineers and scientists in our profession are not yet members of AIME. It is obvious we haven't made our organization either sufficiently known or valuable enough to attract their interest. I think many of these nonmembers are saying, "What's in it for me?" and that's the wrong attitude. This organization doesn't exist just to be of benefit to its members, it exists to benefit our society as a whole. How else are we going to develop the knowledge to recover our mineral resources in a responsible and profitable manner if we don't have a technical society to serve as a link between industry and universities, to act as a forum to interchange technical information with other countries, and to aid in developing new mineral and metals technologies which will be needed in the future.

Unfortunately, it's kind of a chicken-and-egg thing. If we don't have the members, we can't support new member services, and if we don't have the member services, we can't attract new members. But member services through meetings, local sections, papers published, short courses given, and books published have expanded tremendously in the last few years without a parallel membership growth rate. Shall we continue to expand these services? I believe we should, particularly in those areas which will benefit those members who cannot attend either our annual or fall meetings.

### **In what ways can the Society of Mining Engineers be strengthened to be more effective as a professional organization?**

The key word is professional. A professional organization can only result from its members being professional in the strictest sense of the word. I have just spoken of two ways to maintain this professionalism: through professional registration and continuing education of our members. We must realize that as professional engineers we have a responsibility to our country, not just to our employers and ourselves. To fulfill this charge, each of us must contribute more of ourselves to our society. Our efforts in GEM committees in each of our sections can be an area where each member can contribute effectively. By speaking from our technical experience, SME members can "translate technology to the lay public so that they will be informed legislators and voters." If we don't respond, pressures by many organizations will result in mineral shortages in the US. These shortages will, in turn, result in a continuing balance of payments de-

ficit which has only been started by our continuing purchase of foreign energy.

### **As SME-AIME president, what will you emphasize in 1978?**

I have already discussed two of the areas I believe should be emphasized: an increase in member services and the GEM program. Finally, I would like to see an increase in membership; and I believe the areas where this is possible are the coal and industrial minerals divisions. Both these areas pose a challenge because they are served by other organizations and journals. In neither case, however, do these organizations and journals furnish the professional association and opportunity for technical publication that SME does. The addition of a substantial number of people from these two disciplines, particularly to our active membership, will be a considerable advantage during the next few years, when we face particularly difficult times.

We all know there is strength in unity; certainly that has already been conclusively demonstrated within SME ranks. A larger and more cohesive SME through the addition of large number of coal and industrial minerals engineers will also increase our impact on the problems facing us.

### **The Society's student membership has exploded to about 20% of the total membership. What can these future engineers do to contribute and become more fully involved in Society affairs?**

I am very much concerned about the rapid increase in our SME student membership. As of December 31, 1977, there were 8800 AIME student members; of this figure over 4400 of them belonged to SME. We are trying to determine which of the SME divisions these students are interested in, but I suspect most of them are geology students. Of the remaining students, almost 2000 belong to TMS, 2370 to SPE and only 9 in ISS. We have recognized that supporting these SME student members is a serious drain upon our finances. This has resulted in a raising of student dues for 1978 from \$4.50 to \$9.00. Even so, student dues income does not cover the costs of student programs.

I am worried that all these students cannot get jobs in the minerals industries or in any discipline related to the minerals industry. I think somehow our colleges and universities should have a responsibility to limit the number of students in any one discipline. A year ago I was talking to a dean of engineering at a northwestern university. He said they were turning out one forestry student for every tree in his state. I realize I may be criticizing one of the basic rights which people in our democracy expect—that is, an education in the field of their choice—but at the same time I am worried about this approaching surplus of graduates in certain fields.

Two years ago in this column, Jack Havard advocated a return to the concept of the professional degree, as an option to the M.S. and Ph. D. programs. I completely agree with this thinking; and as a member of the Dean's Advisory Council at Mackay School of Mines I have tried to emphasize quality of graduates, not quantity. □