

New Industry, Falling Prices

La Caridad Mine is an ambitious venture in uncertain times.

Fantasy sometimes comes true, and this seems to be the case for a mine sheltered by a mountain range at 5,400 feet above sea level. La Caridad mining and metallurgy complex is located in the Mexican state of Sonora, which borders with Arizona, some 165 miles northeast of Hermosillo, the state capital. It is currently the second most important mine of its type in the world and possesses the most advanced copper-mining and processing technology currently available.

Together with the mineral-rich areas of El Alacrán, La Púrica, Bella Esperanza and La Florida, La Caridad mine was discovered thanks to a joint program developed with the United Nations which allowed a significant breakthrough in the country's mining prospects. Mexicana de Cobre (Mexican Copper) began building the project in 1974 as a completely integrated industry that started out as a mining venture and has been developing other aspects of the process according to a previously designed program.

The existence of at least 1,350 million tons of mineral reserve containing an average 0.6% of copper and 0.02% of molybdenum was confirmed in 1979, which was when work actually began at the mine and at the grinding and concentrator plants. The lime and molybdenum plants became operational in 1980 and 1982, and the smelting plant began

test runs in January of 1986. The program eventually includes production of electrolytic copper, molybdenum derivatives, sulphuric acid and phosphate fertilizers.

AT THE VANGUARD

Xavier García de Quevedo, administrative director of Mexicana de Cobre, explained the project's dimensions as a means of illustrating La Caridad's importance in our mining industry. He recalled that, "the project was conceived in 1968, and exploratory work and economic feasibility studies began that same year. At the time the prospects for copper on the world market were attractive. When the first phase of the project was completed, basically the mine itself and processing plants, the price of copper still stood at \$1.20 per pound, which made the project entirely feasible."

Mexicana de Cobre was set up in 1968 with 10 million pesos (when the exchange rate stood at 12.50 to the dollar), and by May, 1986, despite difficult market conditions, the firm's capital had increased to 101.457 billion pesos (at an exchange rate of 550 pesos to the dollar), most of it dedicated to new investment. Mr. García said that when the second phase of the project, the smelting plant got underway, the price of copper still made the investment viable. Trouble started in 1982 when the price of the ore on the world market collapsed.

By this time, said Mr. García de Quevedo, it was impossible to turn back, and the decision was made to carry on with

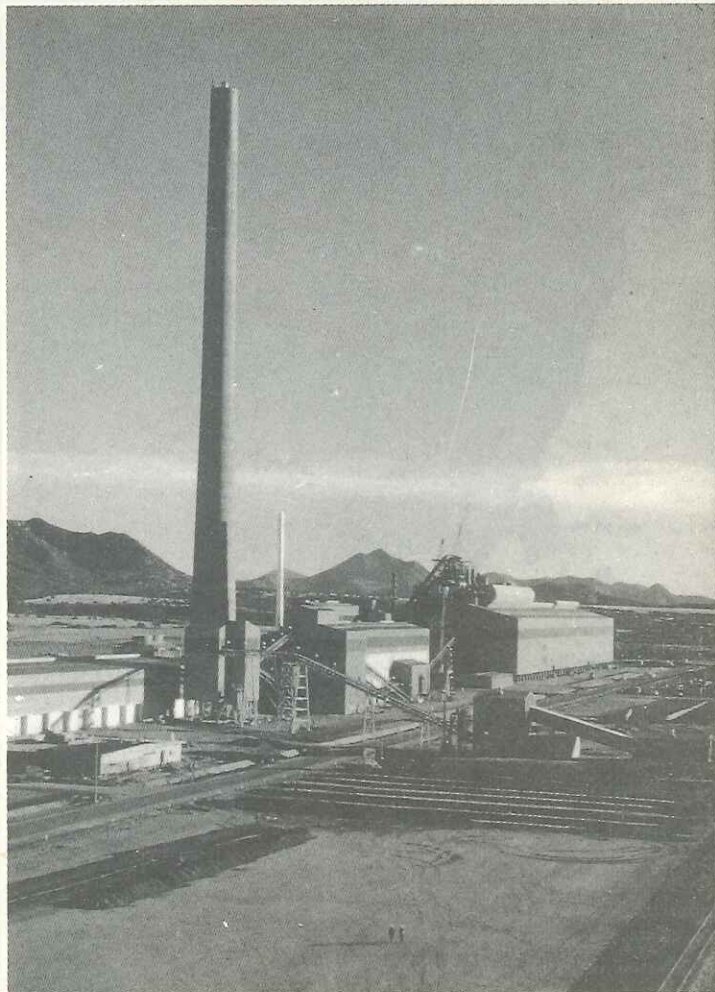
the project. The country benefited as it ceased to import large amounts of copper metal and moved to the head of copper mining the world over.

Despite disappointing prices, two open-sky copper mines are currently operational in Mexico, La Caridad and Cananea, both located in the same region at a distance of some 62 miles one from the other. 1984 was an especially important year because over 50% of the ore mined was sold abroad, confirming the sector as one of the country's main exporters.

"The fact that prices are depressed doesn't mean a lack of demand," says Mr. García. "We've been exporting copper concentrates from the very beginning; over 90% of our production goes to Japan, Korea, China, Germany, Italy and the United States. And now that we have the smelter our outlook is even

brighter, particularly because of the purity of our copper, one of the deposit's characteristics." La Caridad has certain important geological features that reduce costs and make it profitable, among them the high copper content of the ore that is mined.

The only possible means of competing on the world market is to reduce extraction and processing costs as much as possible, but at the same time, the availability of new technology completely closes the gap between a developed country and our own. Mexicana de Cobre's Xavier García explained that in the United States many mines have lower copper-content levels and don't have the latest technology, something which has led to the shutdown of 14 of the 25 most important plants. Many smelting plants are also in the process of closing down because they are unable to meet pollution control standards.



La Caridad, the third largest mining-metallurgical plant of its type in the world.

Photo by Jorge Belancourt

the nation

As a by-product of these difficulties, for the first time in its history the United States will become a provider of raw materials to a developing country: it will send ore to Mexico for the smelting process.

PROBLEMS DON'T SCARE US

Overall, the mining sector was hit by constantly lower prices for minerals on the world market during 1985, as was indicated in a report on the Mexican government's National Development Plan for that year. The report added that the mining and metallurgy sector showed a 17.5% growth rate during 1985. The sector's trade surplus was \$545 million, a 28.8% fall compared to 1983 and 33.4% slide when compared with figures for 1984. Yet mining activity continues.

We were also told that thanks to the project underway, smelting, which was previously carried out abroad, will now be

done in Mexico. Copper metal with a high component of aggregate value will be exported from now on, and the new smelting process will allow for the recovery of most of the gold and silver also contained in the ore. Most important of all, this will generate new foreign exchange income and allow for the substitution of costly imports.

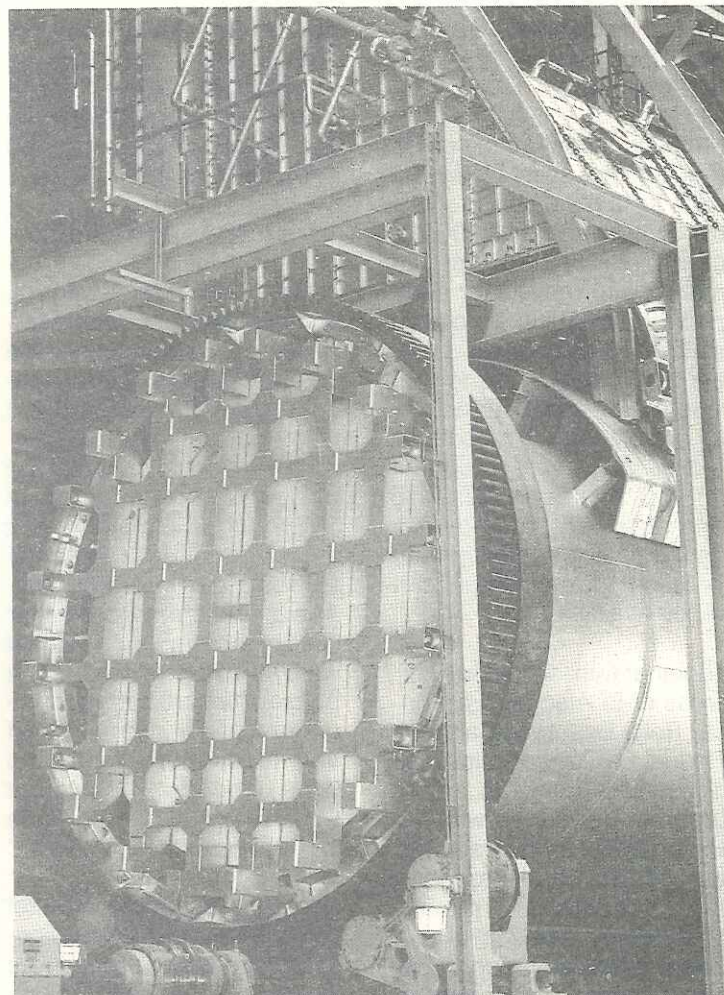
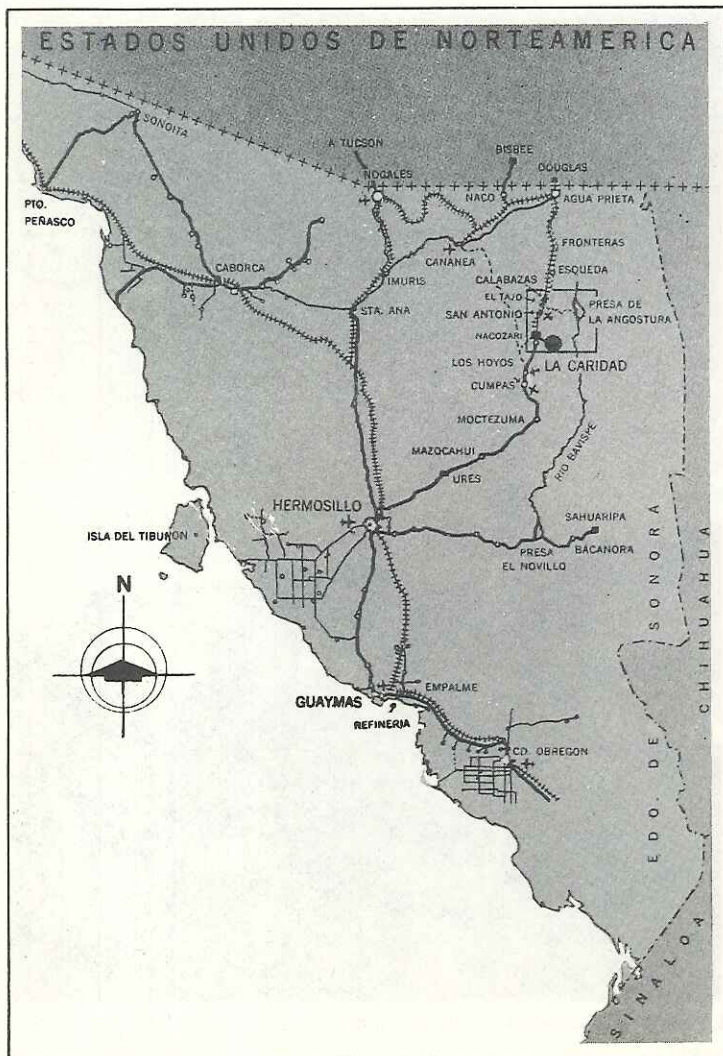
Yet the future for copper is not a particularly bright one. Synthetic materials with many of copper's characteristic are beginning to appear, and this metal is probably going to be displaced from many of its current uses. Yet none of this seems to frighten the businessmen behind the La Caridad industrial complex.

In its Oct. 1985 issue the magazine *Minero* (Miner) published an article called: "Copper, Industrial Restructuring and New Technology," which describes how the greatest danger for copper comes from

the optic fibers used in telecommunications. "These are siliceous threads used to transmit the rays of light issued by laser rays. These threads are capable of transmitting up to 10 times as much information as copper wire can, and of doing so much more neatly. The cost of these new materials tends to be lower than copper's, and will probably continue to shrink in the future," states the author, ad-

ceased to be profitable, all of which means there is stability in the copper market." He adds that although optic fibers may well replace copper there are other technologies currently under development that use this metal, such as different means of harnessing solar energy.

Yet as a recovery in the price of copper is still expected, lower prices have not affected



Advanced technology in Mexico: inside the smelter complex.

ding that further market contractions are to be expected for primary and refined copper, as well as for wire and cable, estimating that as much as 35% of the market could be affected over the next ten years.

But Mr. García believes Mexico's copper industry probably won't come up against too many problems because, "on the one hand, world demand for copper is on the rise, and on the other, many mines have closed down because they

production at La Caridad. Many phases are still incomplete, including the sulphuric acid plant which will avoid causing ecological damage by using a chimney that expels toxic gas into the air at a height of 850 feet.

La Caridad is a good example of industrial integration and of the workings of joint economic ventures (private business and the state) in our country's traditional mining activities.★

Enrique Vargas Anaya