A STORY OF THE CONVERSION OF COPPER ROCK

TO COPPER METAL

Almost ninety percent of Arizona's copper production comes from the large lowgrade mines of the state, namely the Morenci Mine of the Phelps Dodge Corporation, the New Cornelia Mine of the same corporation, the Ray Mine of Kennecott Corporation, the Inspiration, Miami, and Castle Dome Mines in Gila County and the Bagdad Mine in Yavapai County. The developed ore in none of these mines averages more than twenty pounds of copper to the ton; the average recovery in recent years was 18.2 pounds of copper per ton and about fourteen cents per ton in gold and silver. In all cases, the mining claims were on Federally owned land, and were duly patented according to United States Mining Laws.

Over two hundred millions of dollars had to be spent on the above properties before they began to produce copper and return a profit to the investor. It took vision and courage, as well as capital to convert these large copper deposits into profitable enterprises. If it had not been for the application. of brains and capital to the development of this copper, these properties would be so much worthless rock in mountains of scenic value only. And if it had not been for this copper, one wonders whether this Republic could have survived the last two WorldWars. It most certainly seems fair to expect Arizonans to pause and reflect on the matter of taxation of these big copper producers. They should be taxed of course, the same as any other industry, but they should not be treated like the proverbial goose that laid the golden eggs. Such proposals as the recent one to single out the mining industry by saddling it with a special tax to help pay retirement pensions to state employees, are grossly discriminatory to say the least. It so happens that the mining industry has already been discriminated against by a similar severance tax now on the books, and while the mining companies are not complaining too much about it, it is nevertheless discriminatory, and there is no justice in compounding it with additional taxes.

The Magma Copper Company is now engaged in the development of a stupendous orebody in the Mammoth District of Pinal County, and this is a prime example of the conversion of worthless rock to copper metal. Over one hundred million dollars will have to be spent and six years of work and planning before they will get a dollar's worth of copper out of the mine. It behooves every Arizonan to stop and think before doing anything that might discourage this investment. Our very life and liberty may depend on us having this new copper, when out present developed ore bodies are depleted.

The noted mining engineer, J. R. Finlay, was engaged in 1922 by the State of New Mexico to make an appraisal of the state's mining properties. His remarks on one of the State's resources, coal, are apropos of copper also. He said:

> "The fact is that the very abundance of the coal, while it is an inestimable resource to the nation, makes the greater part of it worthless to the individual. I find no warrant for putting a value upon the undeveloped coal of the State; one might as well put a value on limestone or granite. Is not limestone made into lime and cement, and granite into buildings and statues? Have not fortunes

been made out of cement factories and granite quarries? The Rocky Mountains are made up of granite and limestone, why not value them at so much an acre? The answer is that all these resources are worthless until a plant and an industry is started upon them."

It took six years and the investment of over one hundred millions of dollars to make the "Clay Ore-Body" at Morenci a profitable enterprise. It took six years and \$15,000,000 to make the Ray Mine a dividend-paying proposition. It took six years and \$15,000,000 to convert Inspiration into a dividendpaying mine. It took five years and \$15,000,000 to make the Miami Mine pay. It took five years and \$25,000,000 to make the Ajo Mine. It took four years and \$12,000,000 to make the Castle Dome Mine return a profit. And it took five years and \$10,000,000 to make the Bagdad Mine a profitable investment.

In addition to San Manuel's planned hundred-million dollar investment for the production of 140 million pounds of copper annually, there are other large expansion programs in other parts of the state. Copper Cities Mining Co., is planning a \$15,000,000 investment near Miami, Arizona, and hope to be producing at an annual rate of 45,000,000 pounds of copper by 1954. A \$25,000,000 expansion program by Phelps Dodge plans for an annual production of 75,000,000 pounds of copper by late 1954. American Smelting and Refining Co., is planning a \$17,000,000 investment to produce 36,000,000 pounds of copper annually at its Silver Bell properties in Arizona. Production should start in late 1953. Bagdad is planning on the expenditure of \$13,000,000 to double its present production of 20,000,000 pounds annually. These new programs combined will produce an additional 300 million pounds of copper annually by 1955 or 1956.

Before the big, copper producing properties were developed, they were operated as small mines for many years, during which time, the higher grade portions of the ore-bodies near the surface were mined out, leaving the lowgrade for science and capital to develop. Large-scale operations were necessary to make the ventures profitable. Churn drilling was essential to determine the extent and grade of the ore-body, after which shafts, drifts, crosscuts and raises had to be driven to block out the ore and prepare it for extraction. This drilling and development usually delimited the orebody by classifying as ore only that which could be mined, milled and smelted at a profit. Naturally, improvements in mining, milling and smelting as time went on, changed what had been originally classed as waste into profitable ore. In many cases the life of the mine was doubled by the discovery of new technical processes. Hence a mine which had originally a 20-year reserve of copper, remained in business long after the twenty years were gone. In some cases additional drilling on the fringes of developed ore-bodies, showed many years supply of what would have originally been classed as waste, but with new processes, became pay ore.

The result of all this alchemy, or the conversion of worthless rock to valuable copper metal, has been the creation of millions of dollars of taxable wealth in the State of Arizona. The big copper producers of Arizona have taken Federal lands on which no taxes were being paid, and have put them on the tax rolls, thus contributing to the State tax revenue. The mining industry is the chief primary industry of Arizona and its ramifications extend to all parts of the State. There are many industries and professions in the large cities of Phoenix and Tucson which derive their income from trade with and services for the miner, millman and smelterman, and their families. The foundries of Phoenix are almost one hundred percent dependent on the mining districts for their business. The copper miner is the highest paid wage earner in the State, and he spends practically all of his earnings within the State. The railroads get the major part of their revenue from the mines and smelters in the form of freight on ores, concentrate and blister copper. The power and telephone utilities derive much revenue from the mines. Many state and federal employees in Arizona are paid out of the taxes which the mining companies pay. The wholesale and retail stores in Phoenix and Tucson get considerable business from both the mining companies and their employees in the mining districts. The farmer and stockman raise food for the miners.

Thus it is demonstrated that the mining industry plays a vital and important part in Arizona's economy. It's ramifications extend in every direction. Contrary to the "popular" belief that the mining industry is exhausting the state's natural resources, history has shown that the industry actually has created resources where nonepreviously existed.

Mines are made, not found. It has been almost forty years since a "bonanza" has been discovered. All the big mines in Arizona nowadays are the product of the application of venture capital in large amounts, the use of engineering skill in the invention and construction of labor-saving machinery and processes, and finally the business acumen of seeing into the future. A great industry has been developed, and with proper understanding and equitable treatment, still has tremendous potentialities of remaining vital to the state's economy indefinitely into the future.

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