

## THE CYANIDE PROCESS AT GUANAJUATO

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In 1899 a number of cyanide tests were made on Cubo ore by chemists in the employ of the Mexican Gold & Silver Recovery Co., the owners of the MacArthur Forrest patents in the Republic of Mexico. The results of these tests were far from satisfactory. The consumption of cyanide was low but the extraction also was low, averaging from 40 to 85% of the silver and gold in the ore. Most of the tests were made on samples weighing 100 grams, crushed to pass screens from 20 to 80-mesh. In addition to solutions of potassium cyanide there were added to the charges under treatment, different percentages of potassium ferri-cyanide, permanganate, and even ferro-cyanide, and to some of them were added various amounts of sodium dioxide. The time of treatment, in nearly every case, was 16 hours. In consequence of these experiments, the process was condemned at Guanajuato. Shortly afterward, on the recommendation of E. A. Wiltsee of the Venture Corporation, the Holmes brothers experimented for several months on Sirena and Cubo ores; the results of these further experiments led them to conclude that the ores of this district could be successfully cyanided by sliming everything. One point in their report was especially prominent, that even with 40 days' leaching the sand resulting from crushing to 40-mesh gave no extraction by treating with cyanide solution. This was on Sirena ore. About three and a half years ago the Butters company took up the question of cyaniding the Sirena ore, and E. M. Hamilton, of that company, ran a series of tests on a large scale at the *hacienda* Pastita, treating sand and slime after ore concentration on Wilfley tables; leaching the sand and agitating the slime. The ore was crushed in a stamp-battery to pass a 30-mesh screen. Fifteen days' leaching of the sand with 0.3% cyanide solution, and slime agitation with 0.05% solution gave excellent extraction. The metals in both cases were electrically precipitated on sheet-lead cathodes. The total extractions recovered by Mr. Hamilton from two series of tests showed 92.5 and 94.5% of the total value of the ore, the yield being in concen-