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MILLING AT FLINT, DECEMBER 1868

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Miners in many western silver camps spent many years searching for a recovery process appropriate for sulphide ores. An 1868 test of O'Hara's furnace at Flint was an interesting episode in that investigation. T. J. Butler reported very favorably upon that operation:

> Even the most sanguine friends of the enterprise are more than satisfied. They are perfectly delighted with the perfect manner in which every portion of the mill, from the rock breaker to the pans, performs all it was intended to do.
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> It is no extravagant assertion to say that, it is the most complete, perfect, and economical application of power, on a large scale, to the driving of Machinery that we have ever had the pleasure of examining. The experiences of all past quartz milling, have been consulted, the good adopted and the bad rejected, until it is not probably that there is today, in existence, a quartz mill that approaches so nearly to perfection. The foregoing remarks we make, not as an expert, but after having examined all the principal Mills in Washoe and this Territory, as well as many in California, Montana, and Oregon, and having a smattering knowledge of Machinery in general. Nor is it strange that this degree of perfection should be reached when it is remembered that the Owners, Superintendents and Mechanics engaged in the work are all old Nevada miners and workmen, who have brought to their assistance the experience of that model silver State. The feature, however, that has elicited greatest attention and admiration, among all classes of people, and that commends itself to those interested in the reduction and the successful treatment of Flint ores in particular, is the O'Hara Furnace. . . .
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> At the time of our visit, two weeks ago [on about December 10, 1868], the O'Hara furnace, on so large a scale, had never been put to a practical test, now it is a perfect success, as anyone having ordinary judgment and eyes to see, can satisfy themselves by witnessing the operations of the three now in full

> blast in the Rising Star, feeding themselves, roasting the ore thoroughly, stirring it perfectly and raking it to the receiving bins with as much regularity as the sands of an hour-glass.
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> That the whole establishment from beginning to end is a perfect success there can be no doubt, and now only remains to be proven by the cleanup that will take place between this [Christmas] and New Years, when we have every confidence that not less than $100,000 will find its way into the coffers of the company in San Francisco, as the product of the first week's run. Should the first treatment of the roasted ores, however, prove faulty for want of experience, it will be no matter of discouragement, as it is positively known by actual yield in the mills that the metal is in the ores and that roasting will bring it out if properly handled. It may take a few experiments to fix on the right condition. [Owyhee Semi-Weekly Tidal Wave (Silver City), December 25, 1868]

Butler went on to describe milling at Flint in detail. He was impressed by its design to operate with a very small force of miners--a great advantage in a remote camp where wages were high:

> In the first place, the whole thing is projected with reference to labor-saving. The ore is thrown down from the ore-house to the jawbreaker, where it is broken into small lumps by one of the most powerful as well as complete machines that it is possible to construct. This jaw-breaker, as it is popularly called, is very simple in its operation, being two heaving iron plates hinged at one end and standing at an acute angle to each other, one of which has a short but quick oscillating motion. Into this angle the ore is thrown and broken into particles so rapidly that it takes two stout active men very busy to keep it supplied with rock by shoveling in. It is a pleasure to drop the hard lumps of quartz into its ponderous jaws and to see it crunch them up with more apparent ease than a Western cow would masticate a frostbitten nubbin. From the jaw-breaker the broken ore descends by an incline in a kiln or an extension of the roasting furnace, where it is thoroughly dried before it is passed to the batteries. Here also it is salted and stirred in the handling until it reaches the front of the batteries, which are so nearly on a level with the platform that the labor of feeding is comparatively slight. The crushing is not materially different from other dry crushing. There are thirty stamps at work and ten more being adjusted that soon will be ready.

From the batteries the pulp, after passing through a screen, falls into conveyers that conduct it into hoppers, from which it is fed into roasting furnaces. These are three long brick furnaces, each over a hundred feet; the foundations are about six feet wide, one hundred and seven or eight feet in length and about two feet high. On these furnaces are built, each opening being nearly the whole length of the furnace, about four feet wide and three feet high. Through these flues the fire, which is introduced on the side, passes, and through this the pulp also is drawn by Mr. O'Hara's endless chain process. The center of the bed of the furnace is raised by one tier of brick, in which is put a channel for the chain to run. On this chain are two circular iron frames, with hinges in the middle that permit of their doubling over a circle at each end of the furnace. On each of these frames are six scrapers, set in angling form, three on each side of the chain. The scrapers on one frame scrape the pulp towards the chain, while those on the other turn it the other way, each moving it ahead about four inches. The pulp is introduced at the end away from the fire and is raked towards it, consequently by looking in small openings that occur at intervals along the sides of the furnaces the pulp can be seen in all stages from the time it enters cold, through the red to the white heat as it approaches the fire place, and it is finally raised through into bins where it is allowed to cool before being shoveled into a car and carried to the pans.

As to the management of the pulp after reaching the pans we have made no inquiry but presume like other ores it requires scientific knowledge and experience to treat it properly, and that what is best at one time may prove faulty at another. In fact we are informed by good amalgamators that in the simplest and most docile ores in the camp such a difference often occurs in a single day's run as to render quite a different process necessary in the afternoon to that that appeared best in the forenoon. So that it requires constant watching and experimenting and no description of the process can be correct except in particular cases. [Tidal Wave, December 29, 1868]