reached at the greatest depths. In general, the ore is concentrated to a greater degree where the decomposition of the rocks has proceeded to a great depth, as the ground waters that followed the most open passageways accomplished both the decomposition of the rocks and the segregation of the ore.

In shaft mining the veinlike ore bodies were followed in drifts run at different levels, and stopes were raised to the levels above. Most of these bodies of ore are approximately parallel to the strike of the inclosing rocks, especially in the Hardyston strata, where certain layers were more easily replaced than others. Where the ore that was being followed became lean or disappeared, crosscuts were made to either side, or the direction of the drift was changed in a haphazard manner. In the operation of some mines it was assumed that more ore would be found by drifting in a certain direction, and if this surmise proved incorrect efforts would be made to find ore in another direction. Pockets of good ore were thus likely to be located after several attempts, and at the same time a few lumps and small fragments of ore would be found while driving the exploratory drifts.

The loose clay through which the shafts and drifts were driven may be said, with little exaggeration, to have been in constant motion from the time mining started until all the openings were filled by caving after mining ceased. Shafts were abandoned on account of squeezing, which pushed them out of plumb, and drifts tended to close through the pressure, which at times became so great that large timbers were broken or shoved out of position. In most mines it was necessary to timber both shafts and drifts very carefully, and the close timbering prohibited any examination of the occurrence of the ore except at the working face.

In most mines there were no ore chutes or loading pockets, as the activity of the mines was of too short duration to warrant their construction and also the great amount of clay present would have prevented the ore from running through them. In some mines the ore was loaded in buckets that were placed in a small car, which was then pushed to the bottom of the shaft and hoisted. In other mines small cars were used without the buckets.

The quantity of water encountered was a serious obstacle to the mining in almost every mine that exceeded fifty to seventy-five feet in depth. Cornish pumps were used in almost all the mines, and the water was used in washing the ore.

The mining equipment was never elaborate, because of the character of occurrence of the ore, and the output of any particular mine was consequently small. It is doubtful whether the output of any of the mines averaged more than 35 tons a day, and in most of them the average output was less than half that quantity.

Preparation for Market

The large amount of clay invariably associated with the limonite ore necessitated washing most of the ore before it could be shipped to the furnaces. In some mines masses of fairly pure ore were obtained that were practically free from adhering clay, and these were ready for shipment as mined, but this material was exceptional.