HISTORY OF VINTON IRON FURNACE

by

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Vinton Iron Furnace was built in 1853 by Clark, Culberson & Company. The site was located on Elk Fork in Section 31 of Madison Township, Vinton County. The furnace went into blast in 1854 using charcoal as fuel. The original stack was 32 1/2 feet high and 11 feet across the boshes. It produced around 3100 ton of foundry iron in 47 weeks of operation in 1857. After Mr. Culberson retired, the firm went under the name of Means, Clark & Company.

Around 1868, the firm sank a shaft about 130 feet deep west of the furnace to obtain the Quakertown or No. 2 coal which they planned to us as fuel. In 1872, Thomas Bancroft and Charles I. Rader leased the property from the Philadelphia owners and started smelting the local ores with the shaft coal. Due to a high sulfur content and rapidity of burning, the coal proved to be unsuitable for use as fuel. The firm was then known as The Vinton Coal & Iron Company.

In 1873, Bancroft and Rader decided to modernize the furnace. The top of the stone stack was taken off down to the bosh level and was replaced with a steel jacketed, water cooled stack that was 50 feet in height and 11 feet across the boshes. The steel stack was equipped with a bell system to prevent the loss of furnace gas during charging. Charging was accomplished by means of a special skip car that ran on a track from the charging house to the top of the stack. The inside of the steel stack was lined with firebrick.

A downcomer from the top of the stack directed the volatile furnace gases down underneath three boilers where they were burned to produce steam for operation of the steam engine and compressor. The boilers were approximately 30 feet in length. From the boiler area, the burning gases were directed through a series of flues into two hot blast structures where the heat was exchanged to the compressed air from the blowing tubs which was directed into the tuyeres of the furnace. Each hot blast building was approximately 15 feet in length by 10 feet in depth. After circulating through a series of ceramic pipes in the hot blast buildings, the gases then passed out through a tall stack located at the east end of the boiler area. The charging house was situated on top of the hot blast buildings.

In May, 1875, after it was determined that the shaft coal was unsuitable for iron smelting, Rader started to experiment, using a small oven, in converting the hill coal on the site into coke. The process seemed to produce an excellent quality of coke and it was decided, at that time, to manufacture coke on a large scale. A site was selected south of the furnace stack on which to build a battery of twenty-four coke ovens. The ovens,

known as J. King McClanahan's Improved Coke Ovens, an improvement over the Ordinary Belgian Ovens, were built of the Webster Firebrick. Each oven was 22 1/2 feet in length, 2 1/2 feet wide, and 6 feet in height. On the west side of the oven battery, a brick floor 40 feet wide and 100 feet long was laid onto which the finished coke was discharged and quenched. On the east side of the ovens, a steam powered engine with a huge plunger ran on transfer tracks and was used to push the coke from the ovens. The ovens were sealed by cast iron doors which were luted with fireclay. A special apparatus ran on a set of monorails next to the ovens and was used to remove and replace the doors during and after pushing. The ovens were first placed in operation in October, 1875.

The process of converting coal to coke takes place in the oven when the coal is heated during the absence of oxygen. This process in known as destructive distillation. During the coking process, a number of volatile gases are given off from the coal including methane, benzene, and toluene. Those gases were directed into a series of 16 down flues located in the north dividing walls of the ovens. Air for combustion was introduced into the flues through a series of small holes in the brick. From the down flues, the burning gases were circulated through two chambers underneath the floor and were sent to an 8 foot exhaust chimney on top of the oven battery through 4 up flues. Each oven had its own exhaust chimney that contained a damper to control the heat within the oven. It was necessary for all ovens in the battery to be in operation in order to keep both walls and the floor of each oven hot.

The coal used for coking was of the hill vein, commonly known as the limestone vein and was mined by drifting around 200 yards west of the oven battery. Upon leaving the mine, the coal was dumped over screened bars where it was broken up into pieces around four inches square and collected in a hopper. From the hopper, the coal was taken to a large processing building located at the southeast end of the oven battery. The building was 62 feet long, 32 feet wide, and 50 feet high. It contained an engine to operate one of H. Bradford's Coal and Ore Separators. The machinery was used to crush and wash the coal which removed slate and sulfur. The waste products from the Separator were transferred to a gob pile on the east side of the oven battery. After the coal was crushed to a required fineness and washed in a jigger, that had an up and down motion in water, it was elevated to two large bins located at the south end of the oven battery. From the bins, the coal was loaded onto iron buggies that ran on rails out over the top of the ovens. It was placed into the ovens through two charging holes, one on each side of an oven. A typical charge amounted to around 180 bushels of coal. The coal was leveled and the oven doors were closed and sealed. After being heated for 36 to 48 hours, the finished coke was then pushed onto the brick floor where it was quenched by a stream of water. It was reported that an oven could be pushed, recharged, and sealed in about three minutes thus maintaining enough heat within the oven to restart the coking of the new charge. The charging holes, which are about 18 inches in diameter, were covered with a cast iron lid.

The coke oven project proved to be a failure after it was discovered that the sulfur content in the finished coke made it unsuitable to be used for metallurgical purposes. The ovens appear to have been used to roast ore after the coke project was abandoned. The Company operated the furnace for several years thereafter using coal shipped in from near Athens in Hocking County.

Several events that occurred in the 1870's probably affected the Vinton Company and eventually led to the demise of the furnace around 1880. First, there was a financial crises called The Crash of Jay Cooke that happened around 1873-1874. The scarcity of money during that period greatly weakened the Company. Secondly, it was found that the coke produced from the local coal was high in sulfur causing the iron to be brittle in nature. Thirdly, richer ore fields were being discovered in other parts of the country, and more modern and efficient furnaces were being built that could make pig iron at a cheaper rate than could be produced at the Vinton site. A total of $46,000 had been expended for engines, machinery, and buildings for the modernization of the furnace and the coke oven project.

A part of the old stone stack, the engine house foundation, flues in the boiler area, and 17 of the original coke ovens still remain at the Vinton Furnace site. A researcher from West Virginia University believes the remaining ovens may be the only ones of their kind left in the entire world. The furnace ruins are presently on land owned and controlled by The Mead Timber Corporation. It is hoped that the site will be preserved for future posterity.

Note: Portions of this history were taken from an article by the late Wilbur Stout and from an article that appeared in *The McArthur Inquirer* on November 17, 1875.