

THE CALIFORNIA FURNACE AND THE IRON INDUSTRY

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MOST of the following account of the California Furnace was taken from letters and documents contained in a collection known as the Mathiot Papers, now in the possession of The Historical Society of Western Pennsylvania. Some of the material came from deeds, wills, and other records in the Westmoreland County Courthouse at Greensburg, Pennsylvania, and some from observations made during the excavation and reconstruction of the furnace.

The information about Westmoreland County furnaces was taken from various county histories by J. N. Boucher and others, and *Iron Making and Coal Mining in Pennsylvania* by James M. Swank, 1878.

The information about the operation of the furnace and the manufacture of charcoal came mostly from *Manufacture of Iron* by Frederick Overman, 1852.

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History is not new to the Ligonier Valley. Every Pennsylvania schoolchild knows about Fort Ligonier and the part it played in the French and Indian War; how General Forbes used it as a base to rest and refit his army for its successful attack on the French at Fort Duquesne; how Colonel Bouquet, during Pontiac's War in 1763, on a forced march from Fort Ligonier to lift the siege of Fort Pitt, met and defeated the Indians at Bushy Run. After this defeat Fort Ligonier, no longer needed to protect the settlers, was allowed to fall into disrepair. In 1766, the fort was decommissioned by Gen. Thomas Gage, and Arthur St. Clair, former lieutenant in the British army, was appointed civil commandant of the abandoned fort. Time had taken its toll of the eight-year-old fort. Its walls were falling down; its buildings were rotting away. By the end of the revolutionary war

Mr. Sharp, coauthor of *A Guide to the Old Stone Blast Furnaces in Western Pennsylvania* which was published in this magazine as well as various other articles, has continued in his research on the subject of blast furnaces and also on the Mathiot family.—Editor

there was very little remaining to show that there ever was a fort at that place. Soon all trace of it had disappeared.

A few years before the revolutionary war, Arthur St. Clair acquired land in the Ligonier Valley, built himself a house, and settled down to be a gentleman farmer. When the war started St. Clair, because of his military experience, was given a commission in the American army and fought throughout the war in various capacities. The war's end found St. Clair a major general. He returned to his farm in the valley, no longer a wealthy man, having spent his money to pay his soldiers.

This part of the history of the Ligonier Valley is well known and has been told and retold by many historians. The part played by the Ligonier Valley in the industrial history of the country is not as well known. Because there was no waving of flags or beating of drums this side of history tends to be forgotten, but actually it is just as important, if not more so, than the military history.

In 1792, less than ten years after the surrender of Cornwallis at Yorktown, the Westmoreland Furnace was built on Furnace Run, a branch of the Loyalhanna Creek, and not far from the site of the California Furnace built at a later date. The Westmoreland Furnace, the first in the county, was built by John Probst and at one time was managed by George Anshutz who had built the Shadyside Furnace near the site of the abandoned Shadyside Station on the Pennsylvania Railroad in Pittsburgh. Westmoreland County had sixteen iron furnaces over a period of about sixty years. In addition to the Westmoreland Furnace, some of these furnaces were: the Hermitage Furnace, built in 1803 by Gen. Arthur St. Clair near his home at Oak Grove north of Ligonier, with the hope that he could recoup his fortunes; the Washington Furnace, built in 1809 by Johnston, McClurg and Company and owned by many different people at various times over the next fifty years; the Mt. Pleasant Furnace, built in 1810 and now buried under the roadbed of the Pennsylvania Turnpike where it crosses Jacob's Creek just below Freeman's Falls; the Ross Furnace, built in 1815 on Tubmill Creek in Fairfield Township by Isaac Meason and James Paull, Jr., and managed for thirty-four years by Col. Jacob D. Mathiot (this furnace was in almost continuous blast for over thirty years); the Laurel Hill Furnace, built by Hezekiah Reed in 1846 which, because of the lack of fall in the creek, has a cut stone-lined tunnel tail race from the bottom of the wheelpit to a point about one-quarter of a mile downstream where it comes out at creek level; and

the California Furnace, the subject of this paper, built on a branch of the Loyalhanna Creek in Ligonier Township in 1850 by Col. Jacob Davies Mathiot and his son-in-law Dr. Samuel P. Cummins. It is not known for certain why the name California was chosen, but it can be assumed it was with the hope that the name might bring the same good luck and gold to its builders as the state of California brought to its miners and prospectors.

Dr. Cummins was a practicing physician who was more interested in business than in medicine. It was not until about 1862, when his business ventures were practically nonexistent because of the war and he had taken over his son's practice, that he really started to like the practice of medicine. Dr. Cummins lived for many years in a house on the northeast corner of Main and Fairfield streets in Ligonier.

Colonel Mathiot was an old blast furnace hand. At the age of sixty-two, when he built the California Furnace, he had spent over forty years in the iron business. The earliest record we have of him shows that in 1811, at the age of twenty-three, he was the clerk at Isaac Meason's Mt. Vernon Furnace in Fayette County. After a year he was promoted to manager of Union Forge, another Meason enterprise, and in another year, having proved his ability, was moved back to Mt. Vernon Furnace as manager.

Prior to this, in 1807, he received a commission as ensign in the militia of Fayette and Westmoreland counties. By 1816, he had attained the rank of colonel and was addressed as Colonel Mathiot for the remainder of his life. It was a title of which he was justifiably proud.

Over the next five years he had saved enough money and had gained the confidence of Isaac Meason to such an extent that he was invited to enter into partnership with Meason and James Paull, Jr., to form the firm of Meason, Mathiot and Paull, owning and operating the Ross Furnace, near West Fairfield, Westmoreland County. Mathiot was soon made manager, a position he held until the furnace was shut down for good in 1852.

During these years he was active in many other ways. In 1831, he was elected to the state legislature and served a three-year term, refusing to run for reelection. He served on the board of managers of the Johnstown and Ligonier Turnpike Road and on the board of the Pennsylvania Canal in the Westmoreland County district. In 1844, he was unanimously nominated as the Democratic-Whig candidate from the Nineteenth Congressional District for the next Congress, but he

preferred business to politics. In 1837, he and several other men organized Miller, Mathiot and Company which built and operated the Madison Furnace in Armstrong (now Clarion) County. Mathiot was manager of this furnace during most of the firm's life. In 1844, Madison Furnace was sold to Lyon, Shorb and Company. Over the years Mathiot was a partner in the firms of Mathiot and Allen; Mathiot and Mendell; Mathiot and Paull; J. D. Mathiot and Co.; Mathiot, Cummins and Co.; and many others. At one time he and Noah Mendell owned the Washington Furnace near Laughlinstown (in those days Laughlinton was spelled with an "s"). One of his last ventures was the erection and operation of the California Furnace. He was a very busy man.

California Furnace started operations in either May or June 1850. It was a cold blast charcoal furnace, powered by a waterwheel. Like all furnaces of that time, it used local ores. A hike through the woods surrounding the furnace will enable one to see many of the old ore pits and also several charcoal pits where the wood was burned to make charcoal. The ore, by modern standards, was very poor, being 25 to 35 percent iron, as compared with the Lake Superior ore in use today which will run 50 to 60 percent iron. Little or no limestone was used as the ore had enough limestone mixed with it to act as a flux. Charcoal, which served the dual purpose of fuel and of reducing agent to remove the oxygen from the ore, was made in pits not far from the furnace. Charcoal pits were made by first clearing an area about thirty-to-forty feet in diameter of brush, trees, weeds, etc. Surrounding trees were then cut and split into pieces eight-to-ten inches in diameter and four feet in length. The pile was started by driving a stake about eight feet long into the ground at the center of the cleared area. The cut wood was then set on end, leaning against the center post. This was continued around and around until the desired diameter of the pile was reached. A second tier was started on top of the first and built up at the same time. The openings between the logs were filled with small branches and twigs, and when the pile was finished dirt and sod were shoveled onto the pile, covering it completely. If available, ashes and dirt from a previous burning would be used. When all was covered, the center stake was removed and burning grass and wood were pushed into the hole, igniting the wood. The burning of the pile was controlled by opening or closing holes in the periphery of the pile and in the top. In this way all the wood became charred, and if the collier knew his business, when the fire was allowed to go out and the pile was un-

covered, there would be a supply of charcoal. If the collier didn't know his business or if a bad storm with strong winds came, the fire would sometimes get out of control, and much or all of the charcoal would be burned. Also, poor control would leave unburned wood, which was undesirable. A good collier was one of the highest paid men around a furnace. Some of them made more than the manager. They were charged for the wood used and credited with the charcoal produced. A high conversion rate insured good wages.

Ore and charcoal were charged into the top of the furnace in proportions which experience had shown would give the best yield of iron, or iron best suited for certain purposes. A blast of air would be blown in through a nozzle called a tuyere, which entered the furnace just above the hearth. As the ore and charcoal settled, the charcoal would ignite from the heat and air of the blast. This in turn would heat the ore. When the ore temperature became high enough the carbon (charcoal) would react with the oxygen in the ore, removing it and leaving metallic iron which would sink down through the mass and collect in the hearth or crucible at the bottom of the furnace. The impurities would also melt and go into solution in the flux or molten limestone. Thus, being lighter in weight than the molten limestone, iron would float on top. After several hours operation or blowing, as it was called, the plug would be removed from the taphole at the bottom of the crucible and molten iron would run out, down a clay or sand lined trough into molds. When all the iron was out the molten slag would follow it. A dam in the trough would divert the slag to a pit where it would solidify. When cool it would be broken up and carried to the dump. Slag was always a problem. Once cooled it had no use but was very necessary because of its ability to remove impurities. The California Furnace could produce twenty-five-to-thirty tons of iron per week under the best conditions and probably two or three times that amount of slag.

California Furnace made pig iron which was used by forges and foundries, for pots and kettles up to thirty-two gallons capacity, tea kettles, skillets, castings of various kinds used around the farm, stoves, grate bars, decorative railings, and many other items. Some furnaces cast pipe but it is not known if California did or did not.

Luck was against Mathiot and Cummins. About the time the furnace went into blast a depression had hit the iron industry. They had used all their available funds and had borrowed heavily. Early in the summer of 1851 it was decided to install hot blast. By the time

the furnace went back into operation the creditors had started to close in. Mathiot and Cummins resorted to an old practice; they sold the furnace and 2,800 acres of land to Joseph Moorhead, an attorney, for one dollar. The terms of the agreement were as follows:

This Indenture made the twenty ninth day of December A D 1851 . . . Whereas the said Mathiot, Cummins and Company owing to sundry losses and misfortunes are at present unable to discharge their just debts & are willing to assign all their property for the benefit of their creditors. Now this Indenture Witnesseth that the said Jacob D. Mathiot, Docter Samuel P. Cummins and John Mathiot trading under the firm of Mathiot, Cummins & Company as well in consideration of the premises and for the purpose of making a just distribution of their Estate and Effects among their creditors as also of the sum of one dollar to them in hand paid by the said Joseph Moorhead . . . all that certain messuage or tract of land situate on the Laurel Hill in said Township of Ligonier adjoining lands of Rev. David Kirkpatrick, Joseph Naugle, George Maginnis, Harry Brant and others containing twenty eight hundred acres to be the same more or less having a furnace and other buildings thereon erected — and also all their goods, chattels and Effects and property of every kind, real, personal, and mixed. . . . In trust however & to the intent and purpose that he the said Joseph Moorhead shall do as soon as convenient sell and dispose of all the lands and tenements goods & chattels of them the said Mathiot, Cummins and Company & collect & recover all the outstanding claims and debts to them due and with the moneys arising therefrom after deducting his reasonable costs and charges shall and will pay & discharge all the just debts of them the said Mathiot, Cummins & Company Equally and rateably without distinction or preference . . . in a reasonable time thereafter. . . .

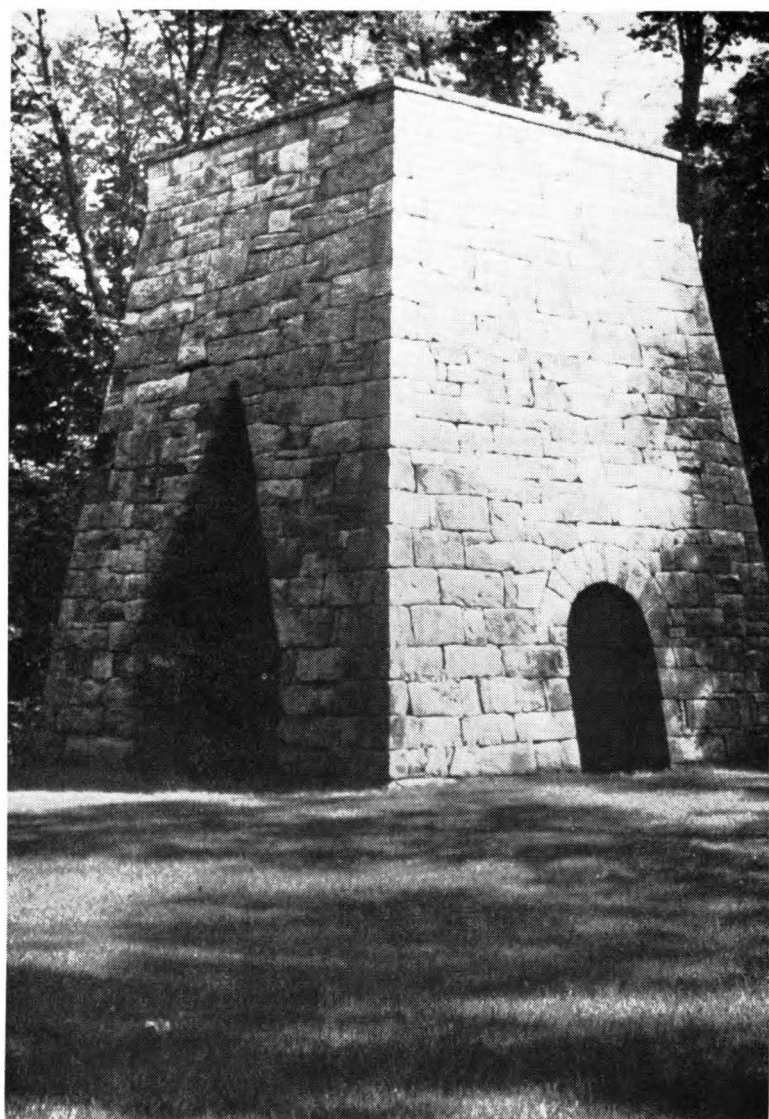
This agreement was in effect until the twentieth day of February 1856 when the following agreement was made:

Know all men by these presents, that I, Samuel P. Cummins, of Ligonier Township, in the County of Westmoreland, and the State of Pennsylvania, am held and firmly bound unto Jacob D. Mathiot, of the township county and state aforesaid, in the sum of Ten thousand dollars, good and lawful money of the United States, to be paid to the said Jacob D. Mathiot. . . .

Whereas the above named Jacob D. Mathiot has this day conveyed to the said Samuel P. Cummins, all his right, title, interest and claim, of in and to a certain tract of land known as the California Furnace lands, situate on the Laurel Hill in Ligonier Township aforesaid, containing twenty eight hundred acres more or less bounded by the lands of David Kirkpatrick, Joseph Naugle, . . . together with the books and accounts heretofore held and owned by the firm of Mathiot, Cummins and Company. Also his individual account in said books, together with all and singular the buildings and improvements erected on said land . . . for the purpose of enabling the said Samuel P. Cummins to pay and discharge the said Jacob D. Mathiot's part of the debts and liabilities due and owing . . . at said Furnace.

On the twenty-ninth of December 1856 Cummins bought from Joseph Moorhead

. . . for and in consideration of the sum of Fifteen Thousand Eight hundred and sixty six dollars and thirty eight cents good money to him in hand paid by the said Docter Samuel P. Cummins . . . that certain messuage or tract of land situate on Laurel Hill . . . containing twenty eight hundred acres to be the same more or less having a furnace and a number of other buildings thereon erected . . . it being the same tract of land . . . which Jacob D. Mathiot, Samuel P.



Rebuilt California Furnace, 1967

Cummins and John Mathiot by their deed dated the 29th day of December A. D. 1851 conveyed to Joseph Moorhead. . . .

Sometime before June 1858 Dr. Cummins sold the California Furnace and lands to Alexander Cavin, accepting a mortgage for the greater part of the amount involved. The deal evidently was not completed by June 7 of that year because Dr. Cummins had an order issued by the court in Greensburg to eject Alexander Cavin from the California Furnace lands.

. . . the right of possession or title to which the said Samuel P. Cummins saith is with him and not with the said Alexander Cavin and which he the said Samuel P. Cummins says he is prepared to prove before our said court.

The deal must have gone through because in May 1863 the property was sold by the sheriff as

the property of Alexander Cavin, deceased, in the hands of Joseph Moorhead, his Administrator, on a writ of . . . the said claim being in the favor of Dr. S. P. Cummins for the use of Charles H. Shriner, now for the use of Jacob Wagner and sold to Jacob Wagner as appears by Deed acknowledged in open court this 13th day of May, 1863.

During the time Alexander Cavin owned and operated the California Furnace, he spent a large sum of money installing steam-powered blowing equipment. In 1859, the store and office burned. Cavin collected insurance for this but in 1861, when the charcoal house burned, he could not collect insurance because he had hay stored in the building, and it was supposed to be used for the storage of charcoal only. There was talk of arson and stories about collusion between Cavin and the insurance adjuster. During the years Cavin owned the furnace, Isaac Lightner of the firm of Kingsland, Lightner and Company, of Pittsburgh, was writing to Jacob Mathiot suggesting that he take over as manager of the California Furnace and get it back into profitable operation again. Cavin owed Kingsland, Lightner and Company a considerable amount of money, and they did not want to lose it.

Alexander Cavin died in 1862 from overexertion while fighting a fire on some of his land on the mountain. Dr. Cummins still held the mortgage on the furnace property, and as told above it was sold to Jacob Wagner. The furnace never operated again, and so ended the turbulent if unprofitable career of the California Furnace. In a letter to Jacob Mathiot in 1865, Dr. Cummins said that he lost twenty thousand dollars through the California Furnace but his son, John Mathiot Cummins, grandson of Jacob D. Mathiot, made the statement to his cousin John Mathiot that his father made a fortune from it.

In 1966, one hundred and three years after the sheriff sold the California Furnace lands to Jacob Wagner, the banks of California Furnace Run, or Rolling Rock Run as it was now called, were again a scene of great activity. Gen. Richard K. Mellon, owner of Rolling Rock Farms on which the California Furnace is situated, had decided to rebuild the furnace. On the first of April 1966 California Furnace was only a tree-covered mound of dirt and stones about fifteen feet high and with a small curved wall, about three feet-by-six feet, visible near the top. From the appearance of the ruins it was thought that for some reason the stack had been deliberately destroyed. Growth rings on a tree growing out of the center of the bosh indicated that the furnace was torn down sometime between 1915 and 1918. Why was California Furnace deliberately destroyed, and who destroyed it? Nature has a habit of destroying stone blast furnaces by tree roots spreading the stones apart until the walls collapse, but California Furnace was too badly disintegrated to have been the work of nature. Rebecca Furnace, in Blair County, was pushed over a few years ago because its condition was such that, being close to houses and in a barnyard with animals around, it was the best way to get rid of a hazard. Pine Grove Furnace, in Fayette County, was pushed over by a man who had bought a bulldozer and wanted to practice with it. Neither of the above reasons would be true for the California Furnace. It is too far from houses or barns to be a hazard, and it was destroyed before the days of bulldozers. One account says it was torn down to get the stones for bridges or buildings. This might have been the reason for destroying the stack, but the stones were never hauled away.

On April 4, men and a bulldozer moved in on the California Furnace ruins. The trees were cut down, and the stones were carefully removed and stacked in a nearby field. As the men approached the center of the mound it was found that the bottom two-to-six rows of stone were intact. All loose stone and rubble were moved away. The inner stack, of which a small part was still standing, was removed as were the hearth and hearthstone (bottom of the hearth). While removing the old hearth, a large piece of iron about fourteen inches thick, six feet long, and two feet wide was uncovered in the bottom and to the front of it. Apparently a breakout or a freeze-up, it had been left there, and a new taphole had been cut in above it. This caused a very steep slope to the floor of the main opening.

On June 14, the work of rebuilding was started. A small amount of new stone was cut from the same nearby quarry that had furnished

the original stone. This was to replace the stone chipped off by the stonemasons in fitting the old stones into the new stack. When the stone stack was about fifteen feet high, work was started on the inner stack of firebrick. When the inner stack reached the level of the outer stack, the two were then built up at the same time. Around the firebrick lining a stone backing was built. Between the stone backing and the outer wall small pieces of stone, slag, and cinders were dumped to act as insulation to cut down on heat radiation. About 80 percent of the stone used in the reconstruction was the original stone from the old stack. A concrete top was poured. This was the only place where the new stack differed from the old. It was thought that this would keep the rain out better than stone slabs.

In excavating along the downstream side of the furnace, many foundations were uncovered. These were probably the foundations for the blowing engines installed by Alexander Cavin. The pit for the waterwheel was still in good condition. The bottom was found to be covered with timbers about ten inches square and ten feet long. These, because they were in damp earth, were still in good condition after all these years. Several pieces of charred wood were found in the pit and foundations, showing that at some time there was probably a fire in the wheelhouse. This could account for the large salamander (a mass of unfused material in the hearth of a blast furnace) found on the bottom of the hearth. Many artifacts were found in the wheelpit and near the furnace such as broken tools, pigs, nails, spikes, worn and broken tuyeres, and part of a waterwheel bearing. The foundation of the furnace was built of very large cut stone and extended at least to the level of the bottom of the wheelpit.

There is a picture in existence of California Furnace dated 1809 (actually 1909) showing the stack intact and several men standing in front of it. One of these men was Robert Graham, grandfather of Charles A. Graham, superintendent of Rolling Rock Farms who supervised the reconstruction of the furnace.

Across the creek and the road from the furnace was the building containing store and office. Its foundations are still there; it was never rebuilt after the fire of 1859. Not far from the furnace is a large frame house. The part closest to the road was the boardinghouse for the furnace workmen. About the same distance in the other direction is the log house where Moses Collins, superintendent under Mathiot and Cummins and also under Alexander Cavin, lived. On and above the charging bench are many foundations. The largest is the charcoal

house which burned in 1861. Other small stone foundations were probably those of log cabins of the workmen.

And so ends the story of the California Furnace, at least for the present. It is hoped that the reconstruction will not stop there but will continue until the flume to carry the water to the furnace, the water-wheel, and the blast equipment have been rebuilt. Also the charcoal house, the store, and a few of the workmen's houses should be rebuilt. Then the California Furnace will look as it did in the early 1850s and will be not only a monument to the early iron workers of the Ligonier Valley but also to those of this generation who care enough about the past to preserve and restore a small portion of it for the edification and enjoyment of future generations.