

THE MUIRKIRK IRON WORKS.

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INTRODUCTION.

This report on the Muirkirk Iron Works is of importance both because of its location in the State of Maryland and the fact that it is a typical example of an industry that has almost passed into history. Its location in the State of Maryland at once sets it apart in the iron-producing field as one of the first in the quality of its product. The furnace shut down in 1930, thereby closing the history of charcoal iron-making in the State of Maryland. It was the last of its kind in the State, but it was duplicated in every section of the United States at about the time of the Civil War.

These hillside furnaces rendered valuable aid to the Colonies during the Revolutionary War. The cannon, and the shot to fire in the cannon, were cast of charcoal iron. Later nails and plows were made. "Some of the veterans of the cupola will recall the time when a suggestion to use aught but cold-blast charcoal metal for car wheels was considered approached to criminal intent, as human life might be at stake." But due to cheaper transportation and manufacture of iron by the use of coke instead

of charcoal, these little centers of industry have shut down one by one until now only a few remain.

This furnace, then, is worthy of note, although not in operation at present. So in the following pages I have given a few facts concerning the history, location, process of converting ores to pig iron, and the product of the Muirkirk Iron Works.

HISTORY.

Passano's "History of Maryland" contains the following passage: "The iron industry in Prince George's (County) dates back over a century. The Snowdens, among the original settlers of the county, established furnaces at various points in southern Maryland. The Patuxent Furnace and Forge was long a notable industry. The only iron works now in operation in the county, or in rural Maryland, is the Muirkirk Furnace on the Baltimore and Ohio Railroad, at Muirkirk. It was erected in 1847 by Andrew and Elias Ellicott and modeled after a furnace at Muirkirk, Scotland." The above article was taken from the history copyrighted in 1901. Going back to a time before 1847 we find in the "Maryland Geological Survey", on The Physical Features of Prince George's County, that Richard Snowden and George Yates bought for 11,000 pounds

of tobacco a tract of land called the Iron Mine on January 11, 1669. In 1686 Richard Snowden patented from the Proprietary of Maryland a tract of land which he called "Robin Hood's Forest" and which contained about 10,500 acres. In 1688 Richard Snowden bought from William Parker a tract of land of 800 acres called "Good Will". In 1847 the Muirkirk Furnace was built near the old "Iron Mine". This furnace was bought from the Ellicotts in 1860 by W. E. Coffin of Massachusetts. On the death of W. E. Coffin his son Charles E. Coffin assumed charge of the furnace. The last blast of the old Muirkirk Furnace was superintended by Ellery F. Coffin, who lives at Beltsville, Maryland, and who survived his father Charles E. Coffin. The site of the furnace is now being used as a paint factory.

It is interesting here to note that in "The Iron and Steel Works of the United States," published in 1892, by the American Iron and Steel Association, appears the following article, under Charcoal Blast Furnaces:

"Muirkirk Furnace; Charles E. Coffin, Muirkirk, Prince George's County. One stack, 38 x 8.5, built in 1847, burnt and rebuilt in 1888. Open-top; ore, carbonate, mined in the neighborhood, roasted and crushed before using, pig iron used for car wheels, guns, flange iron, and shot

and shell, annual capacity 7,000 tons net. Brand, "Muirkirk". Selling agents, Robinson and Orr, Pittsburgh, Arthur W. Howe, Philadelphia, and C. L. Pierson & Co., Boston."

The Maryland Geological Survey of Prince George's County, published in 1911, contains the following:

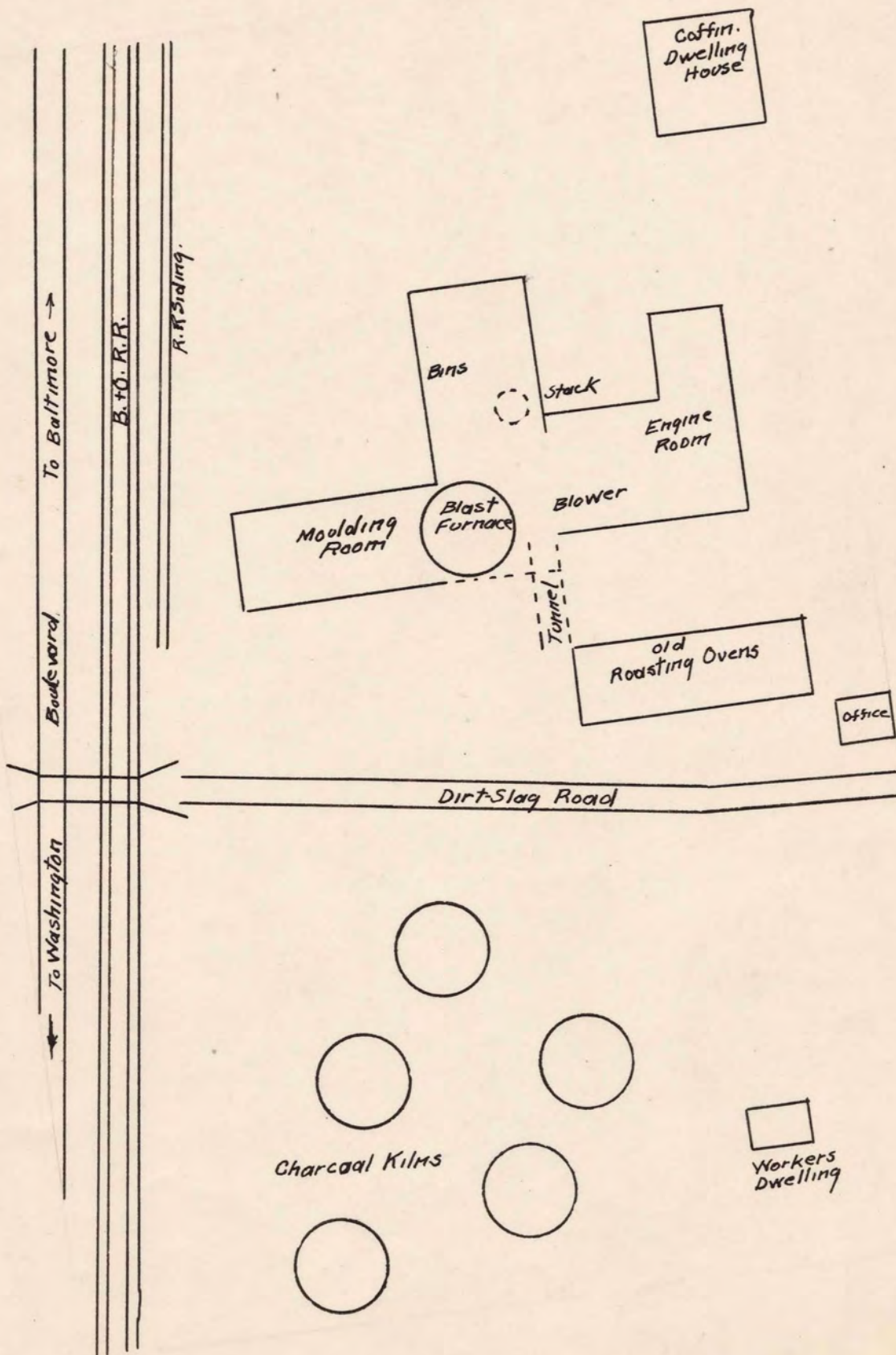
"The Muirkirk Furnace has been in almost continuous use since 1847, and during that period has produced a great quantity of high grade pig iron. After having been closed for three years it was opened again in May 1909 and is producing about 400 tons of pig iron per month from about 1200 tons of ore."

In the above accounts it will be noticed that the Muirkirk Iron Works has been designated as first the Iron Mine, second, Muirkirk Furnace, and now the Muirkirk Iron Works.

LOCATION.

The Muirkirk Iron Works, formerly known as the Muirkirk Furnace, is located in the northern part of Prince George's County, Maryland. It is between Washington and Baltimore, at a distance of about fifteen miles from the former, on the Baltimore & Ohio Railroad and the new Washington and Baltimore Boulevard, which run parallel to each other within a hundred yards to the west of the old furnace.

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About two miles to the east is the old Baltimore and Washington Turnpike. Numerous ponds and lakes within a radius of five miles of the furnace indicate the extensive mine operations of the industry.

The rough sketch on the opposite page shows the relative location of the component parts of the Muirkirk Furnace, which include the furnace, the charcoal kilns, moulding room, crusher, blower, roasting ovens and office. The picturesque kilns and part of the furnace can be seen from the road and the railroad. The houses of the workmen which were furnished by the operators can also be seen to the right of the works.

PROCESS.

Briefly, the process used at the Muirkirk Furnace consisted of mining the iron ore, cutting wood and making charcoal, roasting the ore, crushing the ore, smelting the ore, and moulding the pigs.

The iron ores in the vicinity of Muirkirk are very lean. They are primarily iron carbonates, though many of them have been altered to limonite or hematite near the surface. "The Anne Arundel formation in Maryland has long been known as the important iron-bearing member of the Potomac group, and many mines have been worked in this formation

in Prince George's, Anne Arundel and Baltimore Counties. In Colonial times these mines were of the greatest importance, and many of the cannon used in the Revolution were made from Potomac iron ores. In recent years, however, these mines have decreased in importance, as most of them have been unable to compete with the Lake Superior ores, and at the present time the only furnace using the ores is located at Muirkirk in the northern part of Prince George's County. The numerous immense pits now filled with water that can be seen in this region furnish evidence of the large quantity of ore that has been removed, though the present operations are rather small." (Md. Geo. Surv. Pr. Geo. Co. 1911.) As is the case with iron mining all over the United States, the mines were open surface. After stripping off the surface soil the ore was loaded on horse-drawn wagons by negro labor. It was then carted to the roasting ovens. Owners of the land were paid a royalty for each ton of ore removed.

CHARCOAL.

Since charcoal was one of the essential constituents in the making of the charcoal iron, it must be had in large quantities. Wood was cut in the nearby forests and piled in the brick kilns which held about 45 cords. A fire

was kindled under the pile and after burning a while the open top of the kiln was covered. Thus the volatile matter in the unburnt wood was driven off at the expense of the burning wood. The charcoal was then removed and was ready for use in the roasting ovens and the furnace. This method of obtaining the charcoal was very wasteful and expensive. Later it was found to be much cheaper to buy the charcoal than to make it near the furnace.

Some of the charcoal kilns or ovens still remain and are in a good state of preservation. They are of a good quality brick. The shape is that of a half sphere having a circumference at the base of 100 feet. The floors are of cobblestone. Two openings are provided, one in the top and one near the base. The accompanying photograph gives a good idea of the beehive appearance of these charcoal ovens.

ROASTING.

Originally the furnace had a number of roasting ovens, but they are in ruins now. There was a bank of four of them placed side by side. The ruins indicate that the walls were two feet thick and the dimensions of the base of each was about ten feet by ten feet.

The process of preparing the ore and making pig

iron at Muirkirk was similar to the method used in England in 1400. In a little book called "Charcoal Iron" by Dr. Richard Moldenke, is the following: "The early years of 1400 found pig iron made in England. Parsons (1680) describes the roasting of the ore (calcining) by mixing it with coal and filling up kilns similar to those for burning lime, thus getting the ore ready for the furnace. After lighting up at the bottom and burning away the coal mixed with the ore, the latter was removed and the kiln recharged. The very process can be observed today at Muirkirk, Maryland (1920), where the siderites (spathic ores) of that region are mixed with coke breeze and calcined. The roasted ore then goes to the blast furnace and makes an excellent charcoal iron." After leaving the roasting oven the ore was run through the crusher, coming from the crusher about the size of fine gravel. The ore was then ready to be mixed with the charcoal and put in the smelting furnace.

SMELTING.

The Muirkirk Furnace was 38 feet high and 8.5 at the base. It had a capacity of 7 tons. The main part of it is of fire-brick and is still standing.

Alternate layers of charcoal, roasted ore and

limestone were placed in the furnace until it was charged. The charge was lighted and a cold blast used. The furnace was kept running day and night until the materials at hand were exhausted. Every six hours the slag was drawn off. About ten inches of sand was placed on the moulding room floor. Channels were cut in the sand so that the melted metal would flow to the long rectangular molds in the sand. The channels are called sows and the rectangular bars of iron, after the metal has cooled, are called pigs. The pigs were about four feet long and were broken in half for shipment.

The slag and refuse from the furnace was used for road material, and improved the roads greatly in that section of the county.

PRODUCT.

The Muirkirk Furnace advertised its "Muirkirk Charcoal Pig Iron" as the strongest pig iron in the United States. It was used for many years by the United States Government Arsenals and Navy Yards for cannon, mortars, gun carriages, gun iron castings and other purposes. They claimed it was also in demand for car wheels, plowshares, cylinders, locomotive castings, chilled rolls, etc. Muirkirk iron was graded from 1 to 6. No. 1 had a tensile

strength (pig) of from 20,000 to 23,000 pounds per square inch. No. 6 was white iron. No.4-1/4 was the grade which they claimed to be the strongest iron in the United States. They say, "Muirkirk No.4-1/4: Close grey grain, chills against chill plate in pig bed from 1/8 to 1/4 inch, tensile strength of pig from 38,000 to 41,000 pounds per square inch, and specially selected iron has tested as high as 52,000 pounds per square inch." The last blast of Muirkirk pig iron was bought by the Cambria Steel Company.

John Thomas, superintendent of the Thomas Iron Company, Hokendauqua, Pennsylvania, November 16, 1883, submitted the following report:

"Charles E. Coffin, Esq., In the test we made we cut the piece of pig in four parts in a shaping machine; we turned two of them to exactly 9/16 inch at the breaking point, and got the following results:

" 1st: 50,720 pounds per square inch.

" 2nd: 52,160 pounds per square inch.

"I really don't know whether to believe it or not as the tensile strength is so extraordinary, but nevertheless, these are the results obtained by the machine."

In ledger No.40268.16 of the Muirkirk Furnace appears the following item: "Iron sold and delivered

July 31st to January 31st, 1887, 591 tons, average price \$26.92, net proceeds \$15,913.51."

CONCLUSION.

The Muirkirk Furnace has passed into history. No more will the moulding room floor be filled with live snarkling moving heat as the melted iron flowed from the furnace through the sows to the pigs. The furnace will probably never warm to the heat of another blast. It is empty and cold.

Soon only the name of a once thriving plant will remain. "The foundry world has progressed in the meanwhile and a relentless destiny has closed down most of the furnaces which followed the pioneers of our rapidly developing country and served their needs so faithfully."

It was a typical hillside furnace, dear to the heart of that rapidly passing group of miners who worked their own furnaces. Scattered about are charcoal kilns and negro shanties. The place had a generally run-down appearance. The four roasting ovens are in ruins. Much red clay dust blows about. This red clay is used in the manufacture of paint, for which the plant is now being used. (January 1935) The old family residence of the Coffins still stands proudly near the once busy furnace. But its

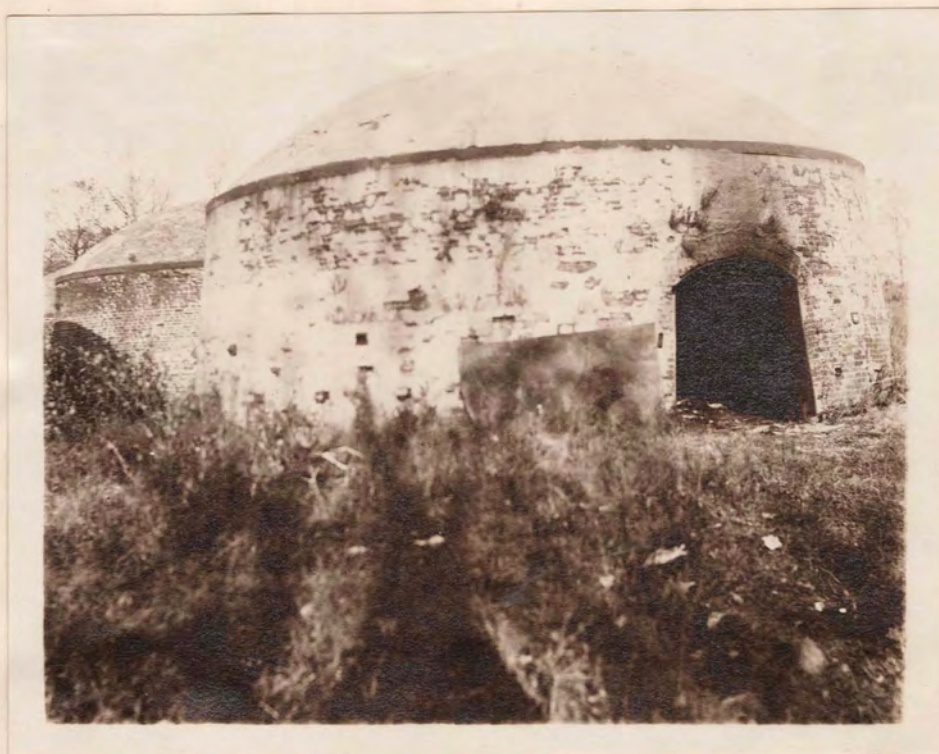
shame is partly hidden by the merciful trees, which sway mournfully in the breeze.

The mighty blast furnaces of today, using coal coke, a hot blast, and operating in multiple, near heavy veins of rich ores, have left the wasteful, forest-consuming, charcoal furnaces far behind as a profit-making industry. But the charcoal furnace was not to be beat in the quality of its product. It is therefore of more than sentimental value to the foundryman and the industry. Maryland may well be proud not of the quantity of its iron production but of the quality of the product of the blast furnaces of which Muirkirk Furnace was a fine example.

BIBLIOGRAPHY.

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- Ellery F. Coffin.....Present owner of furnace.
- John Brewer.....Former workman at furnace.
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- Charles E. Coffin.....Muirkirk Furnace.
- John Thomas.....Report on tensile strength.
- Muirkirk Furnace.....Ledger No. 40268.16.

PLATE I.



Old charcoal kilns.

PLATE II.



Recent photograph of Ironworks.

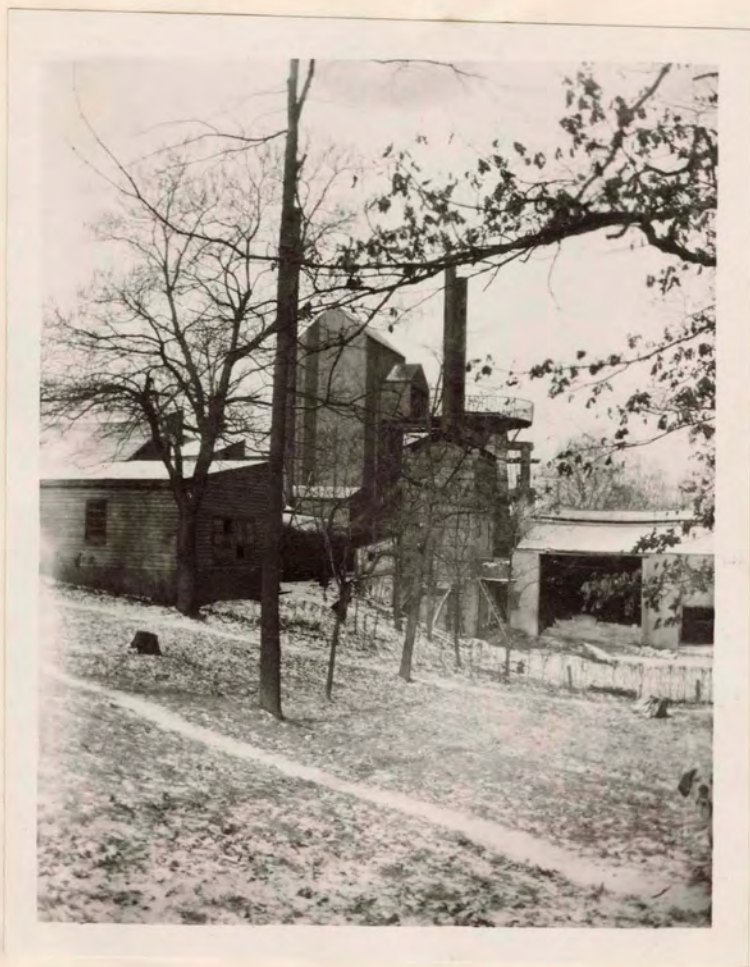
PLATE III.



Photograph of Ironworks taken in 1904

by Charles E. Coffin.

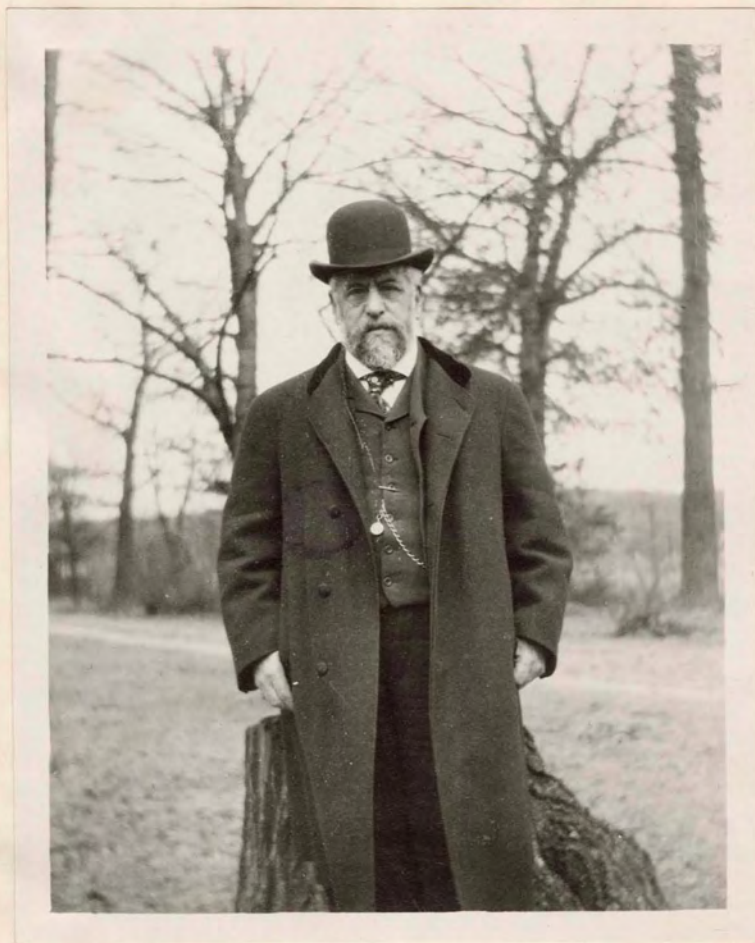
PLATE IV.



View of Ironworks from Charcoal Kilns.

(1904)

PLATE V.



W. E. Coffin.

PLATE VI.



Charles E. Coffin.

PLATE VII.



Old Furnace.

PLATE VIII.



Roasting Ovens.