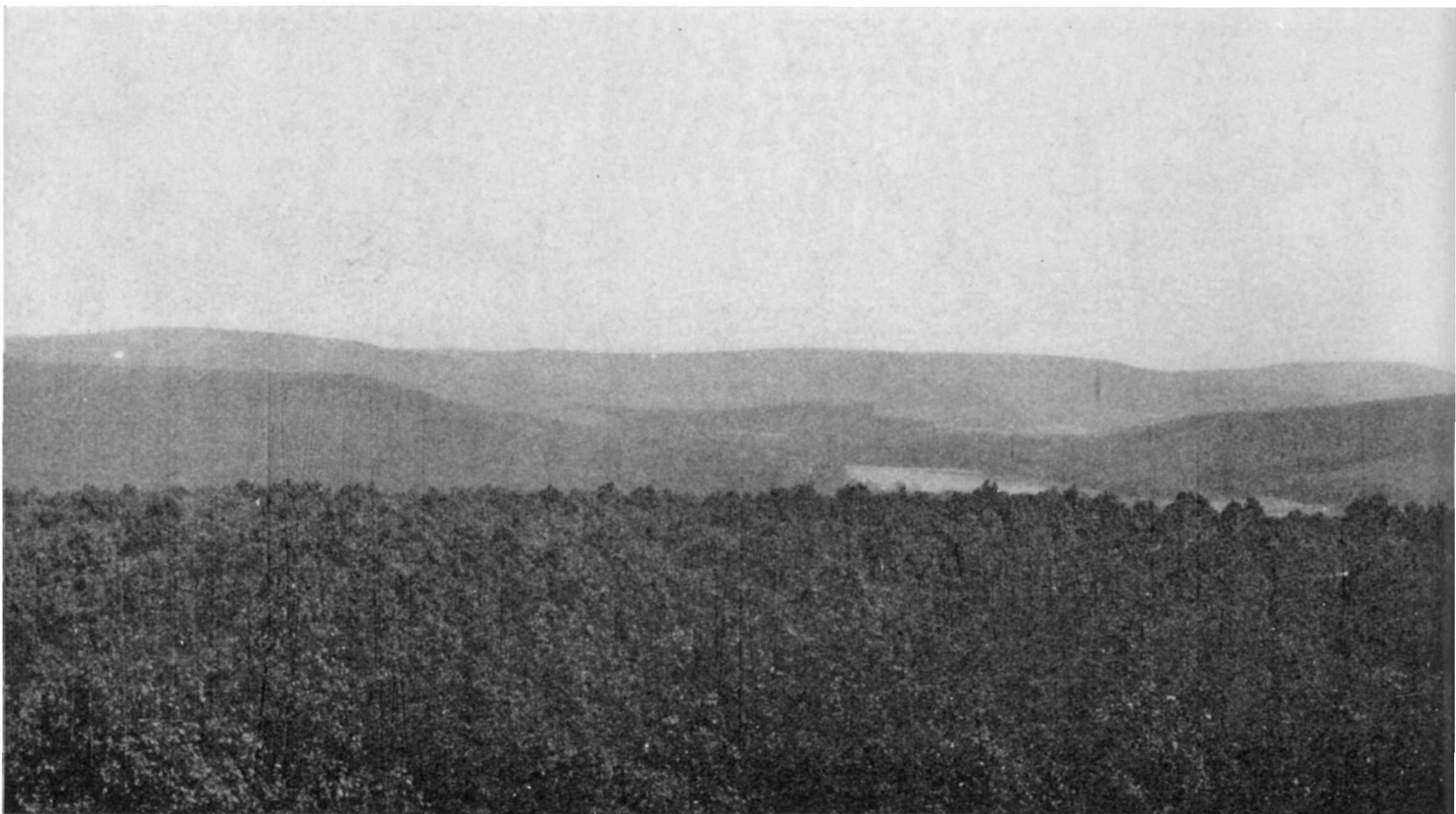


HOPEWELL VILLAGE

National Historic Site

Pennsylvania





Hopewell Village is situated in the little valley of French Creek at the lower right hand corner of the area shown, over and beyond the ridge seen in the immediate foreground. Nearly all the early iron-making establishments were located in the hills in order to obtain water power essential for their operation

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THE COVER

The pen and ink drawing used on the cover is based on careful historical research by the National Park Service and attempts to show part of Hopewell Village as it might have appeared before the ravages of time had destroyed some of its features.



1940

UNITED STATES DEPARTMENT OF THE INTERIOR

HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE · NEWTON B. DRURY, *Director*

Hopewell Village National Historic Site

HOPEWELL VILLAGE NATIONAL HISTORIC SITE, situated 6 miles southeast of Birdsboro, Pa., in the Reading district of Berks County, contains 214 acres embracing the remains of a typical early American ironmaking community. It was established in August 1938, as a unit of the National Park Service, United States Department of the Interior, to be preserved and administered by the Federal Government for the benefit and enjoyment of the people.

Surrounding the Historic Site, and also administered by the Service, is the French Creek Recreational Demonstration Area, nearly 6,000 acres in extent. Although this has been developed primarily for organized camp groups, limited picnic grounds, and other outdoor recreational facilities are also provided for day-use visitors.

Establishment of the Early American Iron Industry

LIKE MANY other now gigantic industries, the great iron and steel business of modern America had humble, pioneer beginnings. Columbus, seeking for wealth in precious metals, as well as for a route or passage to Asia, found none of the natives he met acquainted with the use of "iron, steel or firearms." There was a good reason for this. Gold, silver, copper, and lead often occurred in a "free" state, almost pure, and in sufficient quantity for satisfying the practical needs of even such highly developed Indian civilizations as those of the Aztecs and Incas. Iron ore, on the other hand, was hardly ever obtainable except in combination with oxygen, sulfur, phosphorous, or silica; and its isolation from these "impurities" for the purpose of making iron objects involved a comparatively difficult process. Hence, it remained for the white man to develop iron manufacturing in the Western Hemisphere.

During the first attempts of the English to establish American colonies, an expedition sent out by Sir Walter Raleigh, in 1585, found iron ore in the region of North Carolina. Not until the 1640's, however, were any successful iron works established. These were in the Massachusetts Bay settlements, where under the leadership of John Winthrop, Jr., son of the Governor, a "Company of

Undertakers for the Iron Works" was formed. This company, incorporated by the General Court in 1644, obtained a monopoly to make iron in the colony for 21 years. Capital was secured, skilled workmen were brought from England, and furnaces and forges were built at Lynn on the Saugus River, and at Braintree about 10 miles south of Boston. Quantities of excellent iron were smelted, cast, and forged from the bog ores of Massachusetts at both these works during the next half century.

Colonial Iron Industry in Pennsylvania

OTHER IRONWORKS were soon afterwards established in New Jersey and Maryland, but it was in Pennsylvania that colonial iron manufacture was destined for its most striking expansion. Scattered over the southeastern portion of that State—especially in the Schuylkill Valley, in the wide Susquehanna Valley, along the beautiful blue Juniata, and across the wooded Alleghenies—may still be found the ruins of old furnaces. Each ruin, a pile of stones intertwined with leaves and the wild growth of bramble, was once the scene of great activity, the center of a community where the ironmaster and his dependents lived and labored. Although most of such "iron plantations" had their origins in the eighteenth century, many remained until the nineteenth, and even later. With the development of large-scale capitalistic enterprise and consolidation after the Civil War they gradually disappeared and became mere memories.

Not a single ironworks was built in Pennsylvania until long after the English Quakers settled there. The first colonists, mostly Dutch and Swedes, were concerned primarily with fighting for a foothold in the New World, and won their livelihood by farming, shad fishing, and trade with the Indians. Other nationalities came in after 1681, however, bringing many families whose names were to become famous in the early American iron industry. There were Englishmen like Thomas Rutter, William Bird, and John Ross; men of Welsh origin like James Morgan, Thomas Potts, and James Old; and Germans like John Lesher and Henry William Stiegel, the latter perhaps better known for his great

work in the field of glass manufacture. Other pioneer ironmasters claimed Ireland, Scotland, and France as their place of birth. Many of the sons of these men also learned the iron business, so that by 1800 most of the important industrial leaders of Pennsylvania were native-born.

The first bloomery forge in Pennsylvania was built in 1716 by Thomas Rutter, near what is now Pottstown. Three or four years later, aided by his friend Thomas Potts, Rutter also built the colony's first furnace, Colebrookedale. After this, progress was rapid. By 1771 there were more than 50 iron forges and furnaces in the province, and at the close of the eighteenth century, iron plantations had been established as far as the western borders of Pennsylvania, and even beyond. Reading (Redding), Warwick, Coventry, Stowe, Hopewell, Spring Grove, Durham, and Elizabeth were but a few among these many early works, the ruins of which stand today as monuments to a race of fearless ironmasters who faced tremendous difficulties in obtaining capital, securing skilled workmen, and dealing with metallurgical problems in an age of experimentation.

The Iron Plantations

THE COLONIAL iron plantations of Pennsylvania in certain ways resembled small feudal manors of medieval Europe. Often they comprised several thousand acres of land. Besides the main works, each had its shops, its dwelling houses and gardens, its orchards and grain fields, and sometimes its gristmills and sawmills. The people literally lived at their jobs, in a compact community which was more or less self-sufficient.

The furnace itself was a truncated pyramid of stone, built into the side of a small hill or bank. Across the opening between was a covered bridge, over which the "fillers" brought iron ore, charcoal, and limestone to the furnace top, where this "charge" was dumped into the stack. At the other end of the bridge house stood one or more large buildings for storing charcoal. Blast to operate the furnace was furnished by a simple system of machinery geared to a large waterwheel. Long ditches, called "races," brought water to the wheel from the surrounding hills or the furnace pond and then conveyed it off again when its power had been spent. Within the main casting house, adjoining the furnace on one side, the molten iron

was run out into waiting molds of scorched and blackened sand. From the furnace structure the impure "slag" was drawn off through a "cinder hole" above the hearth, later to be dumped outside. Both the ore and slag piles were close to the stack.

Some of these early works consisted only of a furnace or forge, while others had both. The forge, where iron ore and cast "pig iron" were refined and hammered into blooms, or bars of wrought iron, was generally not far from the village center. This, too, was operated by water power. Within the forge half-naked men of strong physique swung the white-hot, pasty metal from the hearths to great hammers by means of wide-jawed tongs. Under the steady strokes of these hammers, and amid a shower of sparks, they drew the bars to given sizes. Bar iron from the forges was used by blacksmiths to make tools, implements, and iron ware of different kinds.

On a low hill, overlooking the furnace or forge, stood the Big House, or ironmaster's residence, surrounded by a garden in which bloomed pinks, lilies, hollyhocks, and other old-fashioned flowers. This building had large rooms, with wide, open fireplaces, and fine furnishings often imported from Europe. Together with the immediately adjacent grounds and outbuildings, it represented all there was of elegance in such a community.

Far less commodious were the workmen's homes, sometimes called tenant houses. They were usually small stone structures, or were built of logs and plaster with stone chimneys. All were poorly furnished, without rugs or carpets. Cooking was done at the kitchen fireplace, which also provided heat in winter. Pewter dishes and spoons, iron knives and forks, and wooden bowls and trenchers were the utensils found in these homes at mealtime. The bedrooms were bare and rarely contained mirrors, tables, drawers, wardrobes, or even chairs.

There were also subsidiary work buildings. Among these were the blacksmith shop, where draft animals were shod, and where necessary tools and other hardware were produced; the wheelwright shop, where the several types of wagons used for hauling were constructed or repaired; and the barns and sheds, where mules, horses, and other domestic animals were housed from the elements. In the midst of the community was the ironmaster's office and store. Here the



A scene in Hopewell Village showing the Big House, or iron-master's residence, in the extreme right background and the office and store in foreground



This large house in Hopewell Village is known as the Boarding House, presumably so named because many of the workers obtained their meals there. The domestic architecture of the period is well illustrated by this structure

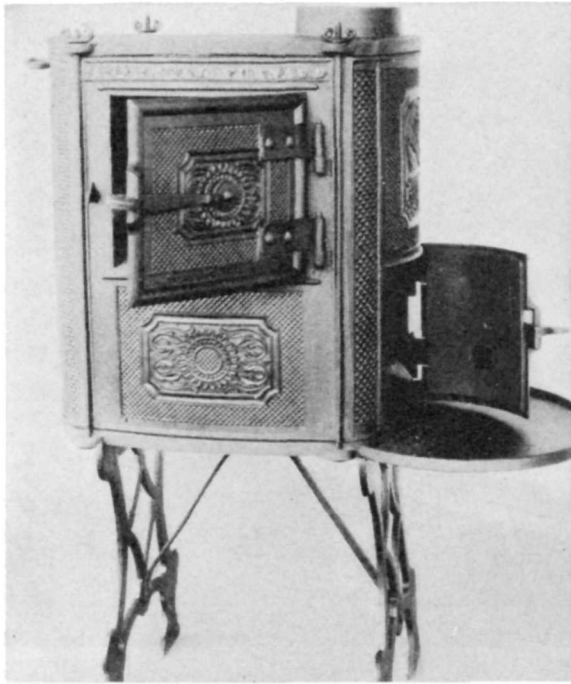


Old Tenant House at Hopewell. Many of the workmen at an eighteenth century ironworks lived in small houses built at the ironmaster's expense. This view shows one of several tenant houses which are still standing in Hopewell Village

Springhouse and lard kitchen, one of several outbuildings on the Big House grounds at Hopewell



The blacksmith shop at Hopewell Village. Here horses and mules were shod and metal parts and fixtures for carriages, equipment, and the general utility of the community were made.



A ten-plate stove made at Hopewell Furnace at an early date. A similar Hopewell stove bearing the date 1772 is still in existence. Hopewell, like nearly all early Pennsylvania furnaces, cast stoves and hollow-ware, such as pots and kettles, in addition to producing pig iron, which was its chief product

business records were kept, and food, clothing, and other supplies sold to the workers. Such stores were necessities because of the long distance from settled boroughs, and also by reason of money scarcity. The ironmaster credited his workers with their daily earnings on one side of his ledger, and on the other he entered the merchandise they purchased. The latter often included rum, shoes, and other manufactured articles which he received in exchange for iron sent to Philadelphia.

Nearly all the Pennsylvania furnaces, Hopewell included, cast stoves and hollow-ware, such as pots and kettles, in addition to manufacturing pig iron which was their chief product. The first stove castings were flat plates of iron with tulips, hearts, Biblical figures, and mottoes for decoration. One old stove marked "Hopewell Furnace" can still be seen at Hopewell Village National Historic Site, while other representative castings are in the collections of the Historical Society of Berks County, in Reading, and of the Bucks County Historical Society, at Doylestown, Pa.

Ironmaking was only a part of the work on these plantations. All the cereals were grown, and even

flax and hemp were produced. Sometimes a flock of sheep provided wool for the making of warm winter garments. In haytime and harvest the village women and children turned out to work long hours in the fields, gathering most of the crop; and during the winter months they also spun thread and wove cloth in their homes. Thus, everyone contributed something to the general economic sustenance.

Social life was a closely knit affair. While the workers generally led an existence of hard labor, they found some amusement in occasional barn dances, corn huskings, and country parties. Once or twice a year the more fortunate among them traveled to the nearest borough fair. Strong drink dulled the steady grind of toil, for there was much use of rum, whisky, gin, cider, and beer. Many ironmasters found drunkenness a real problem.

Picturesque highways led from the ironworks to the world outside, with quaint signboards here and there adding to the attractiveness of nature. Along these roads, long before the middle of the eighteenth century, heavy freight wagons, or Conestogas as they later became known, transported merchandise, goods, and produce to and from Philadelphia, and between the boroughs and towns. Pig iron, castings, and bar iron were hauled in open carts over tortuous roads to the main highways. The cost of carriage under these conditions was exceedingly high. One ton of pig iron which sold for £5 at Colebrookdale Furnace cost from £1 to £2 to carry to Philadelphia, only 40 miles away.

The Technique of Colonial Iron Manufacture

IT WAS NATURAL that men were attracted early to the manufacture of iron in Colonial America, for ores were plentiful. Acrelius, the Swedish pastor at Christina during the middle of the eighteenth century, wrote that there was more in Pennsylvania than the people could ever use. Iron deposits were even found among the loose stones on farm lands. The first ores used were those on the surface or just below. Trenches were dug, rarely more than 40 feet deep, in process of extracting them; and when this depth was reached, new "mine holes" were started. Most of the Hopewell Furnace ores came from the Jones', St. Mary's, and Hopewell Mines, not far from the Village. Only a very few attempts

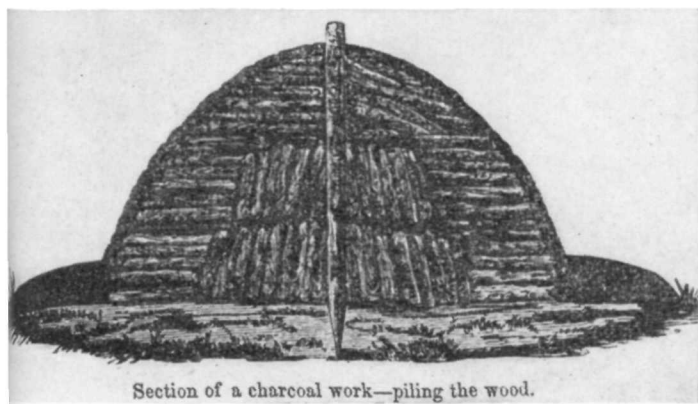


These three photographs show various phases of the process of making charcoal. Charcoal was the fuel used in eighteenth century furnaces and forges. This fuel gave the high heat required for melting iron ore, the impurities in which were fused in the furnace with limestone flux, forming slag. Vast timber resources were needed for charcoal production, one furnace alone using about 240 acres of woodland of 20- to 25-year growth every season. The pictures at the left show a pile of wood nearly ready to be "coaled." Part of the covering of earth and leaves, the purpose of which was to prevent fire from breaking through, is already in place. Note the tools used by the two old colliers. At the bottom is part of the pile after the wood had been completely charred. In the background is a colliers' hut. Charring was done mostly during the winter months, deep in the forests which surrounded a furnace or forge. The colliers had to live with their jobs day and night to prevent the accident of complete combustion, and hence the ruin of the charcoal. It required from 10 days to 2 weeks to char one of these piles of wood.



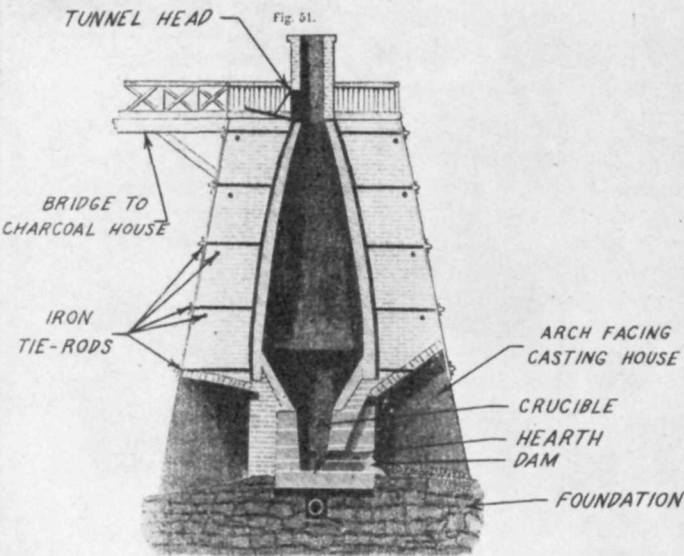
This cross section of a pile of cord wood illustrates the manner of stacking the wood preparatory to starting the "coaling" process. The fire is started in the pocket made by the withdrawal of the center pole. Illustration from Frederick Overman, *The Manufacture of Iron in All Its Branches*. (Henry C. Baird, Philadelphia: 1850)

Reproduction of an old photograph showing a laborer at work cleaning ore at the Hopewell mines. Practically all the iron ores mined in the eighteenth century were bog or surface deposits. Washing the ore freed it of clay or earth

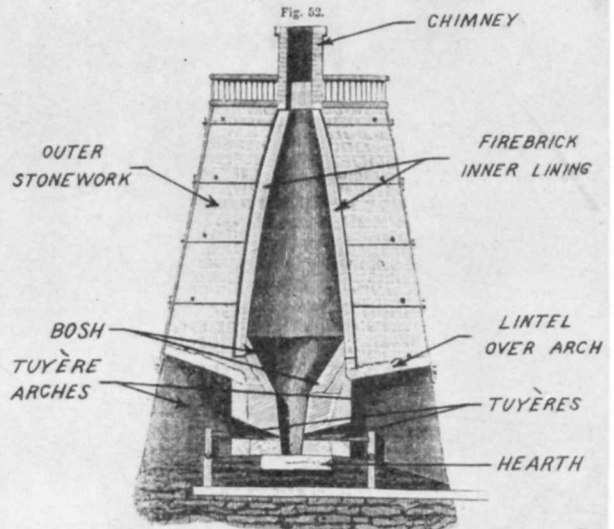


Section of a charcoal work—piling the wood.





Vertical section of a blast furnace designed for charcoal.



Section of a charcoal furnace through the tuyere arches.

Cross-section plans of a typical eighteenth century iron furnace. The section at the left is through the casting arch, that at the right through the tuyere arches. In the Hopewell Furnace the outer stonework is built up in steps or tiers; there is only one tuyere, and there are two instead of four arches in all. This illustration is adapted from one which appears in Frederick Overman, *The Manufacture of Iron in All Its Branches* (Henry C. Baird, Philadelphia: 1850)

were made at shaft mining before the Revolutionary War. Three or four good miners could generally supply all the ore needed for a single furnace.

Charcoal was the fuel used to smelt iron ore in America throughout the eighteenth century. It made an ideal furnace fuel, being almost free of sulfur, and its ash, consisting largely of lime and alkalis, supplied part of the necessary flux. The charring was done in open piles, mostly during the winter months, and generally in the woods adjacent to a furnace or forge, but sometimes even within the limits of settled boroughs. Workers, known as colliers, were required to "coal" the wood, which was cut into given lengths for this purpose by the woodchoppers. One authority estimated that as many as 12 colliers might be needed to keep a furnace going. When the piles were in process of charring, they had to be watched day and night. Thus the bleak and lonely colliers' huts were built in the silent forests, far from the plantation center where the other ironworkers lived. Hickory was the best wood for making charcoal, but black oak and chestnut, being more abundant, were generally used. The wood was not charred immediately after being cut, but only a short time before it was needed, for large as most of the strong-walled charcoal houses were, they

could not hold enough fuel to feed the furnace for any great length of time, and to have left the charcoal outside would have made it unfit for use. An average furnace would consume perhaps 800 bushels of charcoal every 24 hours, and this required about 50 cords of wood of 20-year to 25-year growth. Perhaps the one disadvantage of charcoal as a fuel was its lightness, which made it easy to crush. This was the factor which limited the height of Colonial furnaces to a maximum of about 35 feet.

The outside portion of an eighteenth century furnace stack was usually built of large blocks of limestone or other local stone. Between this and the firebrick in-walls came a few heat-insulating layers of clay, coarse mortar, brickbats, and sand. The widest part of the inner chamber, the bosh, was usually 9 feet in diameter, or slightly less. Hopewell Furnace had a bosh of 6½ feet. This bosh, flaring inward and downward, supported the weight of the charge, relieved the central portion from pressure, and thus permitted the free passage of the blast. The crucible, a cylindrical reservoir at the bottom of the furnace, into which the molten metal ran down and out over the hearth, was relatively small, being only a few feet in diameter, owing to the necessity of concentrating the molten iron to prevent it from solidifying.

Blast for the furnace or forge was supplied by machinery geared to a large water wheel. Sometimes the wheel operated a single or double bellows, which provided an intermittent blast. At Hopewell Furnace, however, a system of blowing tubes

and receiving box was used, which gave a constant blast pressure. On one side of the furnace was an arched recess in which a small opening allowed for the insertion of the "tue-iron" (tuyere), and also the iron pipe connected with the receiving box through which the blast was fed.

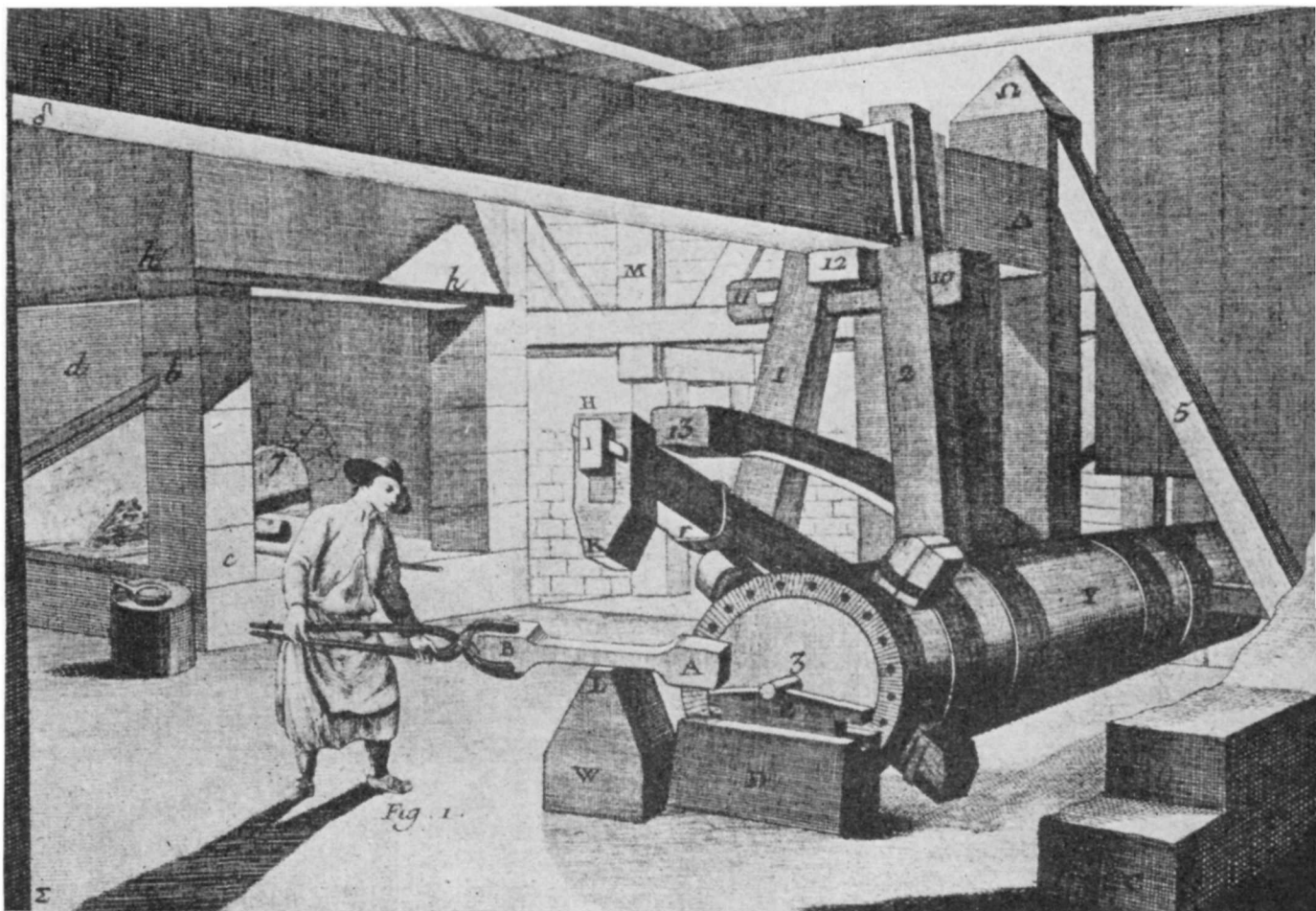
The operation of a cold-blast, charcoal furnace was simple, though it required careful management. Iron ore, charcoal, and limestone were carried across the wooden bridge which led from the bank to the tunnelhead, or opening, of the stack, into which they were dumped in alternate layers. At the tuyere the blast was turned in, burning the charcoal at white heat and melting the iron, which then dropped down to the hearth below. The cinder or slag formed by the chemical fusion of the limestone with impurities in the ore floated on top and was drawn off from time to time. About twice a day, sometimes oftener, the molten iron was run into the casting bed of sand, which was prepared for its reception by molds made from wood patterns. Some imaginative early ironmaster compared this casting bed to a sow and her litter of sucking pigs. Thus the main stream, or feeder, from the furnace was called the sow, while the side gutters were called pigs. Before the iron became cold, the pigs were separ-

ated from the sow and the latter broken up into smaller pieces. It required about 2 tons of ore to make 1 ton of pig iron, and the average furnace produced some 1,200 tons of such iron a year.

Only a few workmen were needed to operate the furnace. Two founders, two keepers, two guttermen, an ore-roaster, a potter, and a few laborers included them all. As the task of ironmaking went on night and day, they labored in 12-hour shifts. The furnace was generally in blast about 9 months of each year; during the remaining 3 it was relined and occasionally rebuilt.

This was the main process. From the furnaces the pig iron went to refinery and ancony forges, or perhaps to another type of furnace for transformation into blister steel. Rolling, plate, and slitting mills produced wrought iron in bars or rods for use of the blacksmiths. Thus, iron products were manufactured for every need.

Forging an ancony at a refinery forge. There were two main types of iron forges used in Pennsylvania during colonial times, the bloomery forge and the refinery forge, the former being the simpler and smaller. The refinery forge, illustrated above, used pig iron from the furnaces and was patterned after those of England. The finished product, an ancony, was a flat, thick bar of wrought iron, with a knob on each end. The picture here shown is taken from D. Diderot and J. B. Alembert, Recueil de Planches sur les Sciences, les Art Liberaux, et les Arts Mechaniques, Vol. III (Paris: 1765)



William and Mark Bird and The Founding of Hopewell Furnace

AMONG THOSE far-seeing men whose imaginations became fired with the dream of building an American iron industry was William Bird, an English youth born in 1706, who came to Pennsylvania early in the eighteenth century. He went to work for Thomas Rutter, the pioneer ironmaster, at Pine Forge, where in 1733 he earned a wood-chopper's wages of 2 shillings and 9 pence per cord. This was a modest beginning, and working from the bottom up.

Before very long, however, young Bird went into business for himself. He acquired extensive lands west of the Schuylkill in the vicinity of Hay Creek, where he built the New Pine Forges in 1744. At this time also he began the construction of Hopewell Forge, believed to have been located at or near the present Hopewell Furnace site. Later still, in 1755, he built Roxborough Furnace (subsequently called Berkshire) in Heidelberg Township. By 1756 he had taken up 12 tracts of land containing about 3,000 acres. The estate upon which his forges stood was alone valued at £13,000 in 1764; and long before his death in 1761 he had become an important figure in the social, political, and economic life of eastern Pennsylvania. His residence, built in 1751, still can be seen in Birdsboro, where it is used as a Y. M. C. A., and preserves a good example of the domestic architecture of the time and place.

Mark Bird, the enterprising son of William Bird, upon his father's death in 1761 took charge of the family business, which he was not long in expanding. The next year, 1762, he went into partnership with George Ross, a prominent Lancaster lawyer, and together they built Mary Ann Furnace. This was the first blast furnace west of the Susquehanna River. Eight or nine years later, apparently abandoning or dismantling his father's earlier Hopewell Forge, Mark Bird erected Hopewell Furnace on French Creek, some four or five miles from Birdsboro. The date 1770-1771 is cut into one of the huge blocks of stone at one of the corners near the base of the Hopewell Furnace stack. At the same time he built Gibraltar (Seyfert) Forge, also in Berks County. All the Birdsboro forges, too, eventually came under his control, and to these works he added a slitting mill and

steel furnace before 1779. He also seems to have built a nailery about this time. Even after the Revolutionary War, when mounting debts fastened themselves on his investments, he continued to expand, building a forge and slitting mill in 1783 at the Falls of the Delaware River, opposite Trenton, in partnership with his brother-in-law, James Wilson.

Mark Bird's Services in the Revolutionary War

MANY OF THESE iron works figured prominently in the Revolutionary War, for Mark Bird, like many other Pennsylvania ironmasters, was an ardent patriot. In 1775, when the war finally came, he served as Lieutenant-Colonel of the Second Battalion, Berks County Militia. Later, in August 1776, as Colonel Bird, he fitted out 300 men of the battalion with uniforms, tents, and provisions, all at his own expense. This force marched under his command to Washington's relief after the Battle of Brandywine in late 1777. He was a member of the Provincial Conference of 1776, and was elected to the Provincial Assembly.

Mark Bird's chief services to the American cause, however, were those of a patriotic philanthropist and munitions-maker, rather than of a soldier. Many of his ironworks, gristmills, and sawmills supplied the Continental Congress with the sinews of war. A report to the executive council of the Continental Congress, dated February 19, 1778, shows that he sent 1,000 barrels of flour to Philadelphia. The minutes of the Continental Congress for June 24, 1777, March 11, 1778, April 8, 1780, and September 10, 1783, refer to large quantities of iron supplies received from him. An interesting order of 1777 discharged 11 men from the militia so that they might be continued in employment "by Colonel Mark Bird, in the cannon foundry and nail works in Berks County in Pennsylvania, carried on by him for the use of the United States." Orders of \$50,000 and \$125,691 were issued, or recommended to be issued, in 1778 and 1780, respectively, in Bird's favor by the Continental Congress. It seems very doubtful, however, that the ironmaster ever collected on the large amounts owed to him by the United States. On September 15, 1783, he addressed a memorial to the Continental Congress, requesting that the Great Chain which had been

BIRDSBOROUGH ESTATE.

On TUESDAY, the 22d day of April next, and the following days, until the whole is sold,

Will be exposed to SALE, by public Vendue,

At the Court-house in the borough of READING,

THE following real ESTATES, late of MARK BIRD, Esq; situate for the most part in the townships of Union, Amity and Robinson, in the county of Berks, and partly in Nantmill, in Chester county, viz.

1st. Hopewell Furnace (and the lands therewith allotted) distant by the present road about five miles from Birdsborough Forges, containing 4338 acres, and allowance of 6 per cent. for roads and highways; 800 or 900 acres the timber on which has never been cut, 200 or 300 acres of second growth timber, now fit for cutting, having more in it than ever. The remainder is chiefly second growth chestnut timber, in a very thriving state. It is thought there is timber enough on the whole tract to serve the furnace for six blasts, 800 or 900 tons each blast, and by the time these are out, it will afford a considerable quantity of timber from the young growth now coming forward, sufficient to supply the furnace for a number of years; there are between 50 and 60 acres of good watered meadow made, which may be increased to 90 acres at a small expence. Also, an excellent young bearing orchard of about 250 apple trees of the best fruit, with a sufficient number of houses to accommodate the workmen. The mines appertinent to this furnace, one whereof is situated in East-Nantmill township, Chester county, two and an half miles from the furnace, which has supplied the furnace 17 years past, having now as good an appearance as ever, the vein or body of ore being 50 or 60 feet wide, contains 160 acres of land, being a valuable farm. The other is near Jones's, in Carnarvon township, Berks county, adjoining to Warwick minehole, of excellent quality, and to all appearances a large quantity of ore, distant from the furnace about four miles and an half, containing 40 acres of choice woodland.

2d. A meadow plantation and tract of land, fronting the river Schuylkill, containing near 200 acres, bounding on Birdsborough farm and Moses Robinson's place; being an exceeding good farm, with valuable improvements.

3d. A tract of land whereon Michael Baird dwells, on the rear of the last tract, containing about 150 acres, on which are erected a log dwelling-house and stone barn; there are about six acres of watered meadow, and an orchard of about 100 apple trees; about 90 acres of the land are cleared, and a sufficient quantity of timber on it.

4th. A tract called George Keppart's place, containing 127 acres, chiefly woodland, having only about 20 acres cleared, of which about three acres are watered meadow, and four acres more may be easily made; two thirds of this tract is arable land; there are also a log dwelling-house and barn on it, and a good spring convenient to the improvements.

5th. Calhoun's place, containing about 150 acres and allowance; there is a log dwelling-house, five acres of watered meadow, about thirty cleared, and a good spring on it.

6th. Bateman's place (beginning 167 and a quarter acres of land and allowance, about four acres of watered meadow are made, and about twenty cleared, with a good spring and log house on it.

7th. John White's place, containing 216 acres and allowance, about seven acres watered meadow made, 40 acres are cleared, has a small orchard, and a log dwelling-house and barn thereon, and a good spring.

8th. Benjamin William's place, has 200 acres and allowance, 10 acres of watered meadow made, 40 acres are cleared, has a good orchard, with log dwelling-house, barn and spring.

9th. A tract of unimproved well timbered land, at the head of Israel Robinson's place, containing about 100 acres; very little of the timber having been cut.

Also, several other tracts of land, near or adjoining to the foregoing lands.

About 3000 cords of wood are cut ready for coaling, and will be sold at the same time.

Thomas Lightfoot, of Uwchland, is now employed in making a correct draft of the premises, with their subdivisions. And William Hays, of Birdsborough, will attend to shew the lines to any person desirous of viewing them; the draft will be produced at the time and place of sale.

One fifth part of the purchase money will be expected within three months after the sale, and the remainder in yearly payments with interest, in proportions to be fixed at the time of sale.

Philad, March 20, 1788.

JOHN NIXON,

stretched across the Hudson River at West Point to obstruct British navigation be delivered to him in part payment on his account. This plea was denied "on the ground that he was a creditor of the United States along with the others, and no particular order should be given in his behalf."

The fortunes of Mark Bird slid rapidly downhill after that. There was a flood on Hay Creek which ruined much of his property, and then came those post-war depression days when two or three Continental dollars would hardly buy a crust of bread. In 1784, making one last desperate effort to avoid the shoals of complete financial shipwreck, he borrowed 200,000 Spanish milled silver dollars from John Nixon, a wealthy Philadelphia merchant. But his fate was sealed. Two years later, obliged to satisfy this debt, he assigned all his vast interests to Nixon. The Hopewell and Birdsboro properties were advertised for sheriff's sale in April 1788, and Bird moved to North Carolina, where he died in comparative poverty. Thus he joined the long list of other once powerful Pennsylvania ironmasters who went bankrupt, a list which besides his own included such names as Matthias Slouth, Frederick Delaplank, John Truckenmiller, and Henry William Stiegel.

Later History of Hopewell Village

FOLLOWING the failure of Mark Bird, Hopewell Furnace passed into other hands. The estate was acquired in 1800 by Daniel Buckley, Thomas Brooke, and Matthew Brooke; and from that time forth it was owned and operated by the Brooke Family, in whole or in part, until its transfer to the Federal Government was completed.

Castings probably continued to be made at Hopewell for many years, although the stock patterns were sold in 1840. After this date nearly all Hopewell pig iron went to various forges in Pennsylvania, bringing prices ranging from \$28 to \$45 a ton, except during the Civil War, when as a result of unusual demand the price at one time boomed to \$99 a ton. A. Whitney & Sons, the big car wheel manufacturers of Philadelphia, contracted for the entire furnace output from 1870 to 1883; and it is therefore not improbable that

Photographic reproduction of a newspaper advertisement of the sale of Mark Bird's estate in 1788 listing Hopewell Furnace as item



Hopewell Furnace and its blast machinery about 1925. The machinery is no longer in place, but its reconstruction is contemplated by the National Park Service as part of a general plan to rehabilitate Hopewell Village



Hopewell Furnace before stabilization. This picture shows one of several large fissures in the furnace stack resulting from frost, vegetative growth, and other elemental forces operating since 1883, when the old stack closed down for good after more than a century of activity

Hopewell iron has rolled over several of America's transcontinental railroads. The furnace remained in operation, except for a few short intermittent periods, until 1883, when it was blown out for the last time. Hopewell was one of the last of the old cold-blast, charcoal-burning furnaces, and, due to many favorable circumstances, it continued in operation long after most of its kind had been outmoded and supplanted by newer and more modern methods and plants of the iron and steel industry.

After 1883 the woodland adjoining Hopewell Village continued to make good returns for several years, but the active days of cold-blast, charcoal-iron manufacture were over. Important technological changes in the industry had already begun to take place about 30 years before. The small, stone furnaces of Pennsylvania have now given way to huge smelters towering 100 feet or more, with giant heating stoves, blowing engines delivering thousands of cubic feet of hot blast per minute, and a vast array of dust arresters, gas washers,



Stabilization of Hopewell Furnace is being accomplished by working from the top down, inside the stack, on small sections at a time. This involves removing all stonework except the outermost layer, which is not touched except to repair breaks; and then replacing the inside stonework with concrete and steel reinforcing in place of the old lime mortar

and automatic ore- and coke-handling machinery. Water power has been superseded by steam and electric power; while coke as a fuel has taken the place of charcoal, and also of anthracite, which was used to some extent after 1830. Hopewell Village today is thus but a memory of a long and picturesque era in the iron industry.

The Rehabilitation Plan

GRADUAL STABILIZATION of Hopewell Village is contemplated by the National Park Service, although much historical, architectural, and archeological research remains to be done before all details are determined. It is hoped, however, that water will eventually run through the races again, turn the furnace wheel, and thus operate the reproduced blast machinery. Reconstruction of other present and once existing buildings is planned to follow. Old-fashioned flowers and vegetables may be cultivated once more in the village gardens; and the blacksmith shop, where much of the original equipment is still in place, will ring anew with the activities of hearth and anvil.

How to Reach the Historic Site

HOPEWELL VILLAGE is accessible by U. S. Route 422, State Route 82, and County Route 06097 from the north; and by State Route 23 and County Route 15133 from the south. The Reading Railroad has a station at Birdsboro, with connections to the Pennsylvania Railroad. There is also bus service to the site, twice daily, during the summer months, from both Birdsboro and Pottstown.

Facilities for Visitors

GUIDE SERVICE for visitors is furnished, covering the most important points of interest in the historic site. Picnic grounds and other like facilities are available in the adjoining French Creek Recreational Demonstration Area.

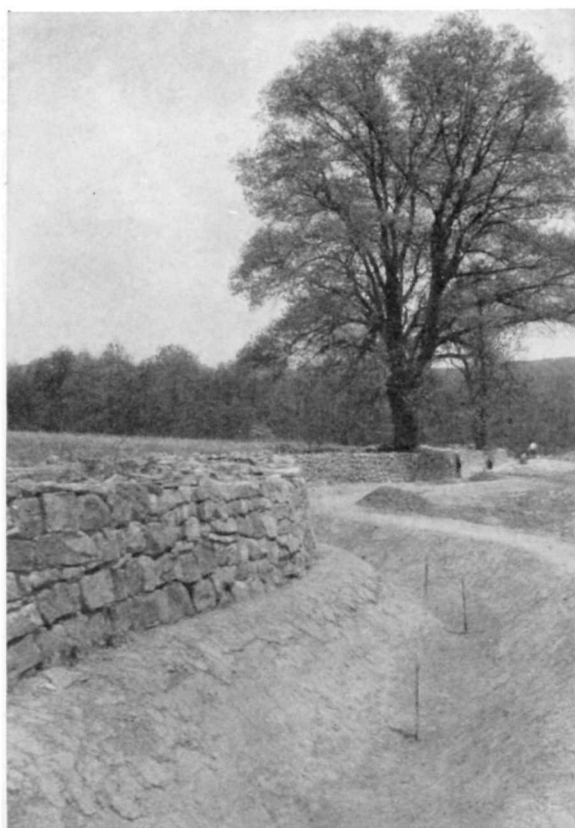
Administration

COMMUNICATIONS and inquiries relative to the area should be addressed to the Superintendent, Hopewell Village National Historic Site, Birdsboro, Pa.



This view, taken about 1935, shows the old pond from which water, carried by the west head race to the water wheel, supplied power to operate the blast machinery. A recreational lake now occupies the pond site

These three views show sections of the Hopewell Furnace east head race. One is of the old race where it runs through the woods about a half mile from the furnace; the other two are of sections of the race and its retaining wall in process of reconstruction by the National Park Service



HOPEWELL VILLAGE NATIONAL HISTORIC SITE

