

Slavery and the Disciplining of Free Labor in the Colonial Mid-Atlantic Iron Industry

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Over the past three decades, historians such as Robert Starobin, Ronald L. Lewis, and Charles Dew have documented the crucial role that slaves played in southern industry from the colonial era through the Civil War. Industrial slavery first took root in British North America along the shores of Chesapeake Bay when entrepreneurs there began to produce iron in the early eighteenth century. By the Revolution, most ironmasters in Maryland and Virginia preferred enslaved labor to that of whites, having come to believe that slaves provided the cheapest, most reliable, and most pliable workforce possible. The success that colonial Chesapeake iron proprietors enjoyed helped to establish slavery as the dominant labor system within most antebellum southern industries.¹

Scholars, however, have devoted considerably less attention to the significance of slavery within northern industry. While many have acknowledged the participation of slaves in northern manufacturing, most have cast them as exotic accessories to the development of an industrial order founded upon white free labor.² This essay challenges that view by examining the role that enslaved labor played within the charcoal iron industries of Pennsylvania and New Jersey during the colonial era. It argues that those who owned furnaces and forges acquired and exploited slaves as an integral part of a strategy to discipline white waged workers and maximize proprietary control over the manufacture of charcoal iron.

During the sixteenth century, as knowledge of how to use blast furnaces to smelt iron ore spread from the Low Countries to Britain and Central Europe, entrepreneurs who invested in and operated ironworks soon learned that they needed both disciplined labor and careful control over production to turn a profit. The scale, scope, and techniques involved in making charcoal iron placed tremendous demands on ironmasters and their workers. The indirect process most often used to make iron in British North America required two lengthy and intricate steps. First, workers charged a water-powered blast furnace with iron ore, charcoal, and a fluxing agent (usually a source of calcium carbonate such as limestone or oyster shells). The blast yielded molten metal which either went directly into castings or cooled to form oblong bars of "pig iron" in trenches on the furnace floor. Since pig iron contained too many impurities and was thus too brittle to make wrought iron goods, it went to a forge for refining, the second step of the indirect process. There forgemmen melted down pigs and reshaped them within the refinery forge hearth into a

pasty mass of metal and slag known as a bloom. They alternately manipulated the bloom under a water-powered trip hammer and reheated it until they had fashioned an anchony, a dumbbell-shaped piece of metal. Within a chafery forge, hammermen flattened both ends of the anchony, squared the edges, and drew it to a specified thickness to yield bar iron. Bar iron could then be used to make horseshoes, tire iron, farm implements, tools, and other goods.

In short, making charcoal iron was both capital and labor-intensive. The operation of a furnace or forge required vast sums of capital, hundreds to thousands of acres of forested land (to provide wood for charcoal), and scores of laborers. To keep a furnace running, men and women executed a series of discrete but profoundly interdependent tasks around the clock for months at a time. The quantity and, more important, the quality of the iron that a furnace or forge turned out depended largely on the speed, skill, and attentiveness with which all hands, but especially artisans such as master colliers, founders, molders, and forgers, executed their duties. They made the crucial decisions that determined the value of what they produced. Not surprisingly, such a situation could easily empower workers, particularly those tradesmen who processed metal, for it enabled them to exert considerable control over the pace and nature of the work they performed. But their influence threatened to cost their employers dearly in an enterprise in which expenses frequently taxed the financial reserves of even the wealthiest investor.

The relative scarcity of labor, especially of skilled hands, in colonial British America magnified both the potential influence that ironworkers could wield and the need of ironmasters to manage costs. During the early eighteenth century, Pennsylvania and New Jersey ironmasters could observe two models to organize work that attempted to address the unique challenges that making iron in North America posed. To their north in New England, ironmasters and other capitalists during the seventeenth century had forged unruly white workers into a labor force that suited their needs by relying on a "culture of discipline." This combined Puritan values that celebrated hard work as capable of reforming those that did it with a legal system that punished "ungodly" behavior that was potentially antithetical to their interests.³ To their south in tidewater Maryland and Virginia, the center of the colonial iron industry from the 1720s until the Seven Years' War, proprietors quickly resorted to the coerced labor of slaves and, to a lesser extent, transported British felons, with considerable success.

Most Pennsylvania and New Jersey ironmasters would by the Revolution construct a labor regime that, in the prominent role it accorded slavery, matched the Chesapeake model more closely than that of New England. As in New England, they initially looked to indentured servants and waged workers to meet their labor needs and they would rely primarily on white free labor thereafter. But within a decade after iron production began in the Delaware

Valley ironmasters eagerly began to acquire slaves. By the Seven Years' War, nearly every operation owned at least one slave and several had already supplemented white skilled labor with enslaved tradesmen. Unlike Chesapeake iron entrepreneurs, however, northern proprietors never intended to supplant waged labor with that of slaves but instead looked to slavery to make free labor more manageable.

Several considerations likely prompted Pennsylvania and New Jersey ironmasters to favor the Chesapeake over the New England model. The ethnic and religious pluralism of the Middle Colonies effectively prevented the development of a hegemonic "culture of discipline" that enabled New England entrepreneurs to modify the behavior of their employees. Such a situation certainly would have made free labor seem more unattractive to mid-Atlantic ironmasters, but it need not have compelled them to embrace slavery. The seasonal rhythms of charcoal iron-making, not too different from those of a plantation, may have encouraged some ironmasters to exploit bound labor. Unlike most northern farmers, who could not find enough work to keep slaves or servants fully occupied year-round, owners of furnaces and forges could employ hands to cut wood that would be coaled the following spring and to make repairs to buildings and equipment when cold weather halted water wheels.⁴ Probably most important to those northern iron proprietors who compared the merits of free and enslaved labor was that slaves had demonstrated within the first decade of Chesapeake iron production that they could fill skilled positions as capably as white tradesmen, in part because some may have brought sophisticated West African metalworking expertise with them.⁵

Ironically, New Jersey hosted the first ironworks in British North America to exploit enslaved labor heavily. In 1675, Colonel Lewis Morris, a Quaker merchant who had immigrated from Barbados two years earlier, purchased a one-half interest in the Tinton Iron Works in Monmouth County. Between 1675 and 1683, Morris hired at least 25 white hands to erect a blast furnace and expand the bloomery into a two-hammer forge that contained a refinery and chafery. Slaves assisted with the construction, and once production began, they formed the largest contingent of workers at Tinton. In *The Model of the Government of the Province of East Jersey*, published in 1685, George Scot claimed that "60 or 70 Negroes" lived and worked there. In 1691, Morris willed Tinton and the slaves who worked there to his nephew Lewis Morris, who would subsequently become Governor of New Jersey. According to an inventory of the deceased Morris's estate taken later that year, he owned 66 slaves: 22 men, 11 women, 6 boys, 2 girls, and 25 children.⁶

Those who erected the first ironworks in the Schuylkill Valley in the early eighteenth century did not copy Morris's extensive exploitation of enslaved labor. They decided instead to depend on indentured servants and waged

hands. Between 1727 and 1730, Coventry Forge owned at least 24 indentured laborers, who served as forgemen, colliers, and woodcutters. Among them was Samuel Nutt, Jr., nephew of part-owner Samuel Nutt, who served as an apprentice forgerman. But Samuel Nutt and his wife Anna could not persuade many servants to remain after their terms expired. Of the 24 indentured servants at Coventry Forge between 1727 and 1730, 11 had departed before 1730 ended. Some, according to Coventry account books, received their freedom dues and left the forge grounds. Others simply disappeared and their names never resurfaced in the forge's financial records.⁷

The inability to retain the services of freed servants represented one obstacle that indentured servitude posed for the Nutts and other northern ironmasters. The proclivity of servants to shorten their terms by joining the army during wartime revealed another. In 1741, Anna Nutt and Company, proprietors of Coventry Forge and Warwick Furnace, petitioned the Pennsylvania Assembly to recover losses caused by the enlistment of ten servants. Nutt claimed that many of those who had entered the military were colliers, in whose training she and her partners had invested heavily. The departure of the colliers in particular, Nutt asserted, had cost the firm several hundred pounds, because the furnace soon ran short of charcoal and had to shut down prematurely. The provincial assembly accepted her petition and volunteered to make restitution for the losses Nutt and Company had incurred as a result of the enlistment of their servants.⁸

Servants who evaded their obligations by enlisting would again plague ironmasters during the Seven Years' War. During that conflict, several Pennsylvania ironmasters filed claims for servants who had joined the Royal Army. The prospect that servants would depart with the blessing of imperial authorities scared off ironmasters and other potential buyers, reducing demand for their services. William Allen and Joseph Turner, Philadelphia merchants and proprietors of the Union Iron Works in New Jersey, claimed that a law passed recently by Parliament encouraging servants to enlist had induced several hundred of them in Pennsylvania and New Jersey, "both Pallatines and English," to cut short their terms. Insecure about their ability to find a ready market for servants who might flee at any time with imperial sanction, Allen and Turner declined an invitation to reenter the Palatine servant trade.⁹

The havoc that the Seven Years' War wrought upon Atlantic commerce also disrupted the servant trade and encouraged ironmasters to try to lure reliable workers away from berths at other ironworks. Indeed, competition for hands influenced trans-Atlantic labor recruitment. Allen and Turner in 1761 demanded that their agent in the Palatinate require any forgemmen that he found to sign agreements to serve them for at least four years. Such contracts, they insisted, would remain unenforceable without "tyes to the Agreemts by bonds," without which "these people may leave our employ, by means of un-

der hand practices that may be made by some [of] the Iron masters."¹⁰

Suspicious that some ironmasters surreptitiously lured servants from others persisted years after the war ended. In 1771, Charles Read, Jr. found himself forced to deny rumors that he had knowingly sheltered the runaway servant of another ironmaster. To his critics Read emphatically replied that

[w]e have always made it an invariable rule at our Works never to be assistant in robing a Person of his Property by Secreating his Servant. [T]he Contrary Conduct is base and unjust as well as ruinus to the Interest of Iron Masters.

One suspects that Read's denial rang rather hollow in the ears of his audience. His statement suggests that most of his peers expected that the need to secure workers to continue iron production superseded any qualms about engaging in behavior deemed "ruinus" to their collective interests.¹¹

Competition for scarce hands did not help secure labor discipline. Nor did ironworkers' notorious fondness for drinking. During the colonial era ironmasters in Pennsylvania and New Jersey sought legislation that would empower them to regulate where their employees drank and how much they consumed. Noting that the sale of rum and "other strong liquors near the furnaces lately erected ... have already proved prejudicial and injurious to the undertakers," the 1725-26 "Act for the Better Regulating the Retailers of Liquors Near the Iron Works and Elsewhere" barred the sale of liquor within two miles of any standing or future furnace in Pennsylvania without a license granted by a majority of the owners of the furnace.¹² After that law expired, the Pennsylvania Assembly a decade later extended the minimum distance from ironworks that taverns could operate from two miles to three.¹³ In 1769, Charles Read won passage of a bill in New Jersey which established a four-mile zone around ironworks in Evesham and Northampton townships, Burlington County, within which no one other than ironmasters could sell hard liquor to their employees.¹⁴

But any problems that northern ironmasters experienced with their white hands, whether drunk or sober, paled beside those suffered by Peter Hasenclever and the American Iron Company. As he investigated to determine whether tracts in New Jersey's Ramapo Mountains would support the large-scale iron production that he envisioned there, Hasenclever learned that "for want of able workmen" the Ogden family had recently closed the Ringwood Iron Works. To avoid sharing his predecessors' fate, Hasenclever recruited and transported from Germany 535 ironworkers, along with their wives and children, to staff the four furnaces and eight forges constructed or renovated by the American Iron Company between May, 1765 and November, 1766.¹⁵

Unfortunately for Hasenclever, virtually nothing went according to plan. Years later, as he defended in print his conduct as the American Company's colonial agent, he would blame many of his problems on the ironworkers he had recruited. Of his former workers, whose "refractory disposition" he considered "a troublesome affair," Hasenclever complained that

they had been engaged in Germany to be found in provisions; they were not to be satisfied; the Country People put many chimeras in their heads, and made them believe that they were not obliged to stand to the contract and agreements made with them in Germany; they pretended to have their wages raised, which I refused. They made bad work; I complained, and reprimanded them; they told me, they could not make better work at such low wages; and, if they did not please me, I might dismiss them. I was, therefore, obliged to submit, for it had cost a prodigious expence to transport them from Germany; and, had I dismissed them, I must have lost these disbursements, and could get no good workmen in their stead.

Given Hasenclever's objectives in writing his account, one must judge many of his claims cautiously. Still, it would be fair to say that his employees' dissatisfaction with their situation cost Hasenclever's London partners plenty and cost Hasenclever his job and his reputation. After they had spent over £54,000 before they began to see any return on their investment, his London backers discharged him in 1767.¹⁶

Hasenclever had received in starker terms the same lesson that other colonial ironmasters before him had learned repeatedly. The scarcity of skilled hands, combined with the heavy labor demands of charcoal iron production, forced entrepreneurs like Hasenclever to rely upon an often cumbersome trans-Atlantic network to recruit the workers they needed. But, as Hasenclever discovered, simply enticing workers to sail across the North Atlantic did not suffice. Few who came voluntarily across the ocean wished to stay on to enrich their employers after their contracts expired. Nor could ironmasters guarantee that those who found their way to their enterprises would honor their contracts or accept the discipline that their employers believed they needed to remain in business. When white ironworkers in British North America refused to conform to the regimen demanded of them, they possessed, as Hasenclever could attest, the power to stop work and wring concessions from ironmasters whenever they wanted.

Scarce labor, high wages, competition between ironmasters to secure the services of hands, and an inability to make their employees work as they wished

prompted northern ironmasters to turn increasingly to enslaved labor to increase their control over the pace and costs of production. Although buying slaves required a substantial investment that might have dissuaded many proprietors already burdened by the high fixed costs of building and maintaining an ironworks, ownership of slaves offered several benefits. Enslaved labor enabled ironmasters to save on wages. Law and social convention empowered colonial entrepreneurs to supervise slaves more closely and punish them more harshly than their white counterparts, whether free or indentured. Finally, unlike an indentured servant or a waged laborer under contract who was free to depart after completing a specified term, a slave served at the master's discretion. That fact enabled ironmasters to limit labor turnover, thereby saving them the time and expense of recruiting workers regularly.¹⁷

Northern ironmasters soon recognized the potential benefits of exploiting enslaved labor. Some ten years after Thomas Rutter opened the first ironworks in the Schuylkill Valley, Pennsylvania ironmasters had determined that they could not secure enough white hands to operate profitably. In 1727, several unnamed ironmasters, claiming "that the Difficulty of getting Labourers, and their excessive Wages, are a great Discouragement and Hindrance to their Undertakings," petitioned the Assembly to admit a bill which would allow them to import slaves duty free. The Assembly permitted the ironmasters to present the bill and it passed on the first vote, although the measure would later be defeated. Two years later, the Assembly moved to accommodate those who wished to buy slaves by reducing the duty from £5 to £2. There it would remain until legislators raised the duty to £10 in 1761 and £20 in 1773.¹⁸

Neither import duties nor the expense of purchasing slaves outright necessarily had to discourage northern ironmasters from using slaves. Those who could not afford to own slaves themselves or those who could but simply wanted to decrease their outlays for wages could hire them. In 1766, Curtis Grubb of Cornwall Furnace spent £275 on the hire of eleven slaves for one year from Benjamin Welsh. Hiring might also appeal to ironmasters who needed the services of skilled slaves, whose purchase price might prove prohibitive. The shareholders of Pennsylvania's Carlisle Iron Works informed manager Robert Thornburgh that "Nat. Giles is Willing we shou'd have his Negroe Forgemmen when their Contracted time is out at Paradise Forge" and instructed Thornburgh that he could "contract for them if he thinks it necessary."¹⁹

The ability to hire did not deter most Pennsylvania and New Jersey iron proprietors from aggressively acquiring their own slaves. At his death in 1752, Thomas Potts, founder of the largest iron dynasty in Pennsylvania, owned eleven slaves. In 1768, the inventory of his son John included thirteen slaves. While no iron proprietor in Pennsylvania or New Jersey after Lewis Morris would ever become as dependent on enslaved labor as his southern peers, most by the Revolution owned more slaves than any of their neighbors. The

four largest slaveholders in Berks County in 1780 were ironmasters, who together owned nearly half (57) of the 119 slaves registered by November 1, 1780 under the "Act for the Gradual Abolition of Slavery." A similar pattern held elsewhere in southeastern Pennsylvania. According to Carl Oblinger, who has analyzed tax lists for York, Chester, and Lancaster counties for the years 1779, 1780, and 1783, ironmasters owned almost one-quarter of the 824 slaves who lived there.²⁰

Unlike Chesapeake ironmasters, who first deployed their slaves to extract and prepare raw materials and later introduced them into positions which demanded more skill, most northern ironmasters quickly placed slaves in jobs which required them to handle and process metal. Slaves seldom made castings. Instead, northern ironmasters increasingly charged slaves with the responsibility to refine and draw iron in their forges, to the point that slaves were often disproportionately represented among forgers. In 1763, William Mayburry advertised two "likely young Negroe Fellows, Forgers by Trade," whom he offered to sell because he had "more of that Calling" than he then needed. Seven years later, William Allen and Joseph Turner announced that they had at a forge on the Musconetcong River "six Negroe Slaves to hire out or sell, who are good Forgers, and understand the making and drawing of Iron well."²¹

The presence of so many slaves among the ranks of forgers may well have been the result of a combination of African metallurgical skill and proprietary need. On his journey into West Africa at the end of the eighteenth century, Scottish surgeon Mungo Park observed smiths who produced steel tools from smelted iron using techniques that were similar to those exploited within forges in British North America. Although no evidence indicates that ironmasters specifically directed agents in Africa to buy individuals or groups of Africans who had expertise working with iron, it seems plausible that they knew that African ironmaking techniques resembled many of those used in refinery forges in British North America. Possession of such knowledge could only have increased the attractiveness of skilled enslaved labor to an entrepreneur looking to control both the costs and quality of the bar iron he sold.²²

Ironmasters often supplemented or redirected whatever skills their slaves may have brought with them by arranging to have white forgers train them in the mysteries of fashioning wrought iron. At Coventry Forge in 1732, servants Samuel Nutt, Jr. and Joseph Tucker made anvil stones with the help of Caesar, a slave owned by William Branson and Rebecca Nutt. Forger John Goucher received in 1743 3s 9d for "an allowance for the Negroes working in his Fire." At New Pine Forge in 1760, hammerman Samuel Barford agreed with John Patton to train Tom for one year. Barford promised "to use his utmost Endavors" to teach Tom "to draw a good Bar & c." in return for 24 shillings for each ton of "good barr Iron" that he made with Tom's assistance.

Patton also guaranteed Barford “a Sufficient House to live in and also ye usual customs of other forgermen” while Barford would provide Tom with food. The desire to find white artisans willing to teach metalworking skills to slaves also influenced who ironmasters chose to recruit. Joseph Turner, investor in the Union Iron Works and Andover Furnace, advised Henry Keppely in 1761 that any forgermen whom he encountered in the Palatinate must agree to “take any Negroes under them to be Instructed while they Live with us” before signing a contract.²³

The fact that some artisans who worked at furnaces and forges were themselves slaveowners could only have facilitated the introduction of enslaved labor to the iron industry. In March, 1774, Thomas Mayberry was credited for making two and one-half tons of anchonies “with his Negro” at Hopewell Forge. Other evidence that white ironworkers held slaves comes from ads that they placed after their unwilling assistants had absconded. In 1751, William James, founder at Cornwall Furnace, announced that three men, Cross, James, and Dick, had run away. Seven years earlier, Isaac fled from Bryan Murry, a collier at Reading Furnace. In 1746, Mark escaped John Hinson, a refiner at Pine Forge, twice within six months.²⁴

Surviving accounts make it possible to assay the degree to which two Pennsylvania forges relied on enslaved labor. Slaves first worked in Coventry Forge in 1732. Table 1 indicates that between 1734 and 1759 slaves played an increasingly prominent role at the refinery forge at Coventry. From 1734 to 1739, enslaved refiners helped to produce just over 6% of the anchonies that the forge made. Between 1741 and 1747, the proportion of anchonies refined partially with enslaved labor rose to 29%. During the last three years of the 1750s, four enslaved refiners—Tom, Ben, Guinea, and Sampson—had a hand in the production of more than 41% of the anchonies made at Coventry. Extant records on chafery activity at Coventry, less complete than those for the refinery, indicate more uneven use of enslaved labor. During the 1730s records show that no slaves drew bar iron at Coventry. Between March, 1742, and February, 1744, alone, John Mills’s fire turned out over 125 tons of bar iron with the help of Lambeth and Sambo. But from 1757 to 1759, enslaved hammermen assisted in production of only 27 of 163 tons of bar iron drawn at Coventry.²⁵

TABLE 1
Tons of Anchonies Produced at Coventry Forge
(Figures in parentheses indicate percentages)

Years	White Finers Only	White/Enslaved Finers	Total
1734-39	377.3 (93.6)	25.7 (6.4)	403
1741-47	124 (71.0)	50.7 (29.0)	174.7
1757-59	103.6 (58.9)	73.3 (41.1)	176.9

Source: Coventry Forge Ledger E, 1734-1740; Coventry Forge Ledgers, 1742-1748, 1756-1759, FFC, HSP.

TABLE 2
Anchony Production at Hopewell Forge, 1768-1775

Produced by	Tons Produced	Percentage
White refiners only	844.6	69.5
White/enslaved refiners	336.1	27.6
Enslaved refiners/handled	18.5	1.5
White/enslaved refiners/handled ²⁶	10.3	0.8
Enslaved refiners only	6.5	0.5
TOTAL	1,216.0	

Source: Hopewell Forge Timebook, 1768-1775, FFC, HSP.

While enslaved refiners assumed a growing role in anchony production at Coventry Forge, the figures presented in Table 1 suggest that ironmasters elected to restrict their use of skilled enslaved labor. At no point between 1734 and 1759 did enslaved forgers help to make a majority of the anchonies that Coventry turned out. Nor did Coventry's owners or other northern ironmasters trust their slaves enough to let them work large amounts of metal on their own. Table 2 displays anchony production at Hopewell Forge between 1768 and 1775. White refiners who worked without any assistance

from slaves accounted for more than two-thirds of the anchonies made at Hopewell during those seven years. Enslaved refiners helped to produce the remaining 371 tons of anchonies, but they did almost none of that work without the direct supervision and participation of white forgemmen. Refining done exclusively by slaves accounted for less than 1% of the 1,216 tons of anchonies turned out by the Hopewell refinery. When more than one slave worked at a refinery hearth, ironmaster Peter Grubb generally required that a white forgemman handle the metal for them under the trip hammer.²⁷

The distinctive role that slaves played in the labor regime of northern ironworks begs some consideration of how their experience compared to that of enslaved ironworkers in Maryland and Virginia. In his observations on the Pennsylvania iron industry in the 1750s, Israel Acrelius asserted that “[t]he negroes are better treated in Pennsylvania than anywhere else in America.” Acrelius based his claim on his belief that Pennsylvania ironmasters fed and clothed their slaves better than owners elsewhere. Surviving accounts do not conclusively support Acrelius’ impressions. But even if evidence did bear out his contention, slaves at northern ironworks would have taken little comfort. More food and warmer clothing might well have appealed to any slave, but most probably would still have preferred to work at a Chesapeake facility.²⁸

First of all, it appears that northern ironmasters offered fewer incentives to their slaves than did their Chesapeake peers. Consequently, slaves at Pennsylvania and New Jersey ironworks had comparatively fewer opportunities to earn credit by doing extra work. Rather than institute overwork as a system, most northern ironmasters rewarded extra work only on rare occasions. At Coventry Forge, enslaved forgemmen might receive small amounts of cash, sometimes from the white forgemmen that they assisted, to spend as they wished. In 1745 Coventry repeatedly gave small amounts of cash, usually between 1s and 1s 6d, to Sambo, while Ben received similar sums less often. Forge accounts do not indicate that Coventry’s owners specifically tied those payments to performance. When Coventry’s investors did directly reward work, they generally did so for tasks completed on holidays. In 1736, Ben received 1s 6d cash for “working on good friday.” Three years later, Ben earned just over 4s for helping Caesar and Lambeth make almost a half-ton of anchonies “in The Crismas time.” A payment of 8s 6d to Cudgo and Sambo “for drawing Iron more than their Days Work” in 1750 marked the only occasion in which Coventry accounts record an overwork credit. The experience of Tob, who Ferguson McElwaine hired out to Peter Grubb at Hopewell Forge, was rather atypical. McElwaine informed Grubb, who did not offer overwork to his own slaves, that Tob “Desires to work close & constant, & if he makes any thing Over his weeks work for his Better Encouragement he’s to have it to himselfe.” McElwaine sent along with Tob a small account book in which he asked Grubb to record how much work his slave did each week.²⁹

The nature of slaveholding within the northern charcoal iron industry (and the North generally) served to impede the formation of families among slaves. As on Chesapeake ironworks, men usually outnumbered women, making it difficult for enslaved men to find companionship where they worked. But unlike in the Chesapeake, no large community of slaves where enslaved men could seek mates or raise families existed off the ironworks. Most masters who lived near ironworks had one or at most two slaves, making the establishment of friendships or conjugal relationships difficult. The dispersed slaveholding pattern found in rural Pennsylvania and in most of New Jersey also hampered the development of an autonomous African-American culture, leaving many of those who endured enslavement there to weather it without the support, comfort, and strength that such a system of shared experience and meaning provided for their brethren who lived to their south.³⁰

But the abstract quality of such a world means little until one considers how it might have affected the daily lives of individuals. Sambo arrived at Coventry Forge on January 1, 1753 lame and sick. Three weeks later, he began exhibiting symptoms of smallpox. His masters sent him off to Mary Richards to nurse him. Sambo soon died, leaving Richards to organize his funeral and dig his grave. For her services, Richards received just over £2. Sambo probably died alone, away from the company and consolation of family and friends.³¹

Where slaves did succeed in creating families, northern ironmasters could demonstrate that they cared little. In October 1768, Peter Grubb bound Amy's "yellow Child" out to Andrew Messersmith, who hauled wood for Hopewell Forge, for one year. Grubb agreed to credit Messersmith for £8 worth of store goods for keeping Amy's child the entire year, but expected that her child would die and so offered to prorate Messersmith's compensation "for what time it Lives."³²

Enough evidence has survived to piece together a plausible explanation for Grubb's action. Grubb bought Amy and one child from John Hart for 2½ tons of bar iron and one stove, together valued at £70, in 1766. It appears that the child that Grubb bound out to Messersmith in October, 1768, was less than one year old at the time and may have just been born. Amy missed two weeks of work the previous month, perhaps because she needed to recuperate from delivery and care for her new baby. Appalled by her absence, Grubb calculated that tending to the child, who Grubb did not think would survive, would cause Amy to neglect her duties. Since Messersmith worked for Grubb and lived near the forge, Grubb ensured that Amy would remain nearby should she decide to run away to join her child. To add insult to injury, Grubb passed on the cost of the child's care to Amy by debiting her account for the thirteen months of nursing that Messersmith's household provided. Two weeks after Grubb charged Amy for those expenses, Amy paid James Taylor 2s 6d for "a Coffin for Child."³³

Although enslaved ironworkers found it difficult to form families or communities, they could on occasion act in concert to make their wishes felt and preserve a degree of cultural autonomy. As he remembered the difficulty that Philadelphia merchants had encountered in disposing of corduroy before the Revolution, Thomas Cope recalled that ironmaster James Old agreed to take some of the material for his slaves. But Old so offended his slaves by attempting to attire them in corduroy "as to threaten an insurrection. Their discontent compelled him to relinquish the idea of clothing them with the rest of the obnoxious article." Cope's memories lend powerful support to Shane and Graham White's argument that African-Americans placed tremendous significance on how they dressed. In resisting together Old's effort to dictate what they would wear, his slaves proclaimed the importance that they attached to how they would present themselves to each other and to whites.³⁴

The behavior of Old's slaves notwithstanding, the plan of most northern ironmasters to introduce enslaved labor into key positions to augment their control over the workplace proved largely successful. Curiously, it seems that their scheme to use slaves to fill positions that required skill met with virtually no overt opposition from white tradesmen. The fact that many artisans who worked in ironworks themselves owned slaves should have served to limit white antipathy to the growing presence of slaves. Many of those who toiled alongside slaves were indentured servants who had little say in determining who worked with them. Others may have chosen to keep quiet for fear of antagonizing their employers. Arthur Bining observed that families of ironmasters in colonial Pennsylvania frequently intermarried, thereby concentrating ownership of ironworks there in the hands of a few kin groups. Such a situation potentially posed a threat to any worker who displeased his employer. A bad reputation acquired at one ironworks might well close doors at others owned by members of the same family.³⁵

Whatever white tradesmen thought of the presence of slaves in forges, their employers' scheme helped ironmasters get the upper hand in negotiations with them. Even though proprietors did not trust their slaves enough to let them work iron alone, the growing ranks of enslaved forgers served to reduce the number of berths available to white forgers. For such white artisans, fewer prospects meant less power to determine on what terms they would work.

Perhaps to no one was this more evident than Curtis and Peter Grubb, proprietors of Cornwall Furnace and Hopewell Forge. In April 1774, the Grubb brothers prepared to renegotiate with forgerman Samuel Jones, who had worked at Hopewell since 1765, during much of that time as a "Servant" under contract. To Peter Grubb's chagrin, Jones did not immediately agree to his offer. His brother, however, assured him that he should not have worried. "If he does not Comply with your Terms or is too high," Curtis instructed Peter

I am Sure I will not Perswade him to Try any more. Neither will I have any more to do with it, so I would desire you May Act According to your Own Judgement in Every thing that Yeald you Most Satisfaction. [I]f one workman should be too Stubborn, there is Plenty to be had, it is time a day Not to be Impos'd upon.

Within five days, Samuel Jones had backed down and acceded to Peter Grubb's wishes. He would remained at Hopewell until at least 1788, when he agreed to take on George as a servant for five years and teach him how to draw bar iron.³⁶

The weak bargaining position of Samuel Jones pointed to changes then overtaking the Pennsylvania and New Jersey iron industries. In an environment in which skilled labor was supposed to be scarce, someone who possessed the knowledge of Samuel Jones should have had other options available to him. That he perceived he did not testifies to the power that ironmasters found they could wield over their white tradesmen. This power was not merely an artifact of abstract laws of supply and demand in local labor markets. Rather, the Grubbs and their peers played a direct role in bringing such a situation to pass. Their strategic use of enslaved labor helped to create a surplus of waged labor and empowered them to deploy it largely as they saw fit. Northern iron entrepreneurs by the Revolution had in effect constructed a historical paradox. They had promoted the development of a waged labor regime while they simultaneously increased their reliance on enslaved labor.³⁷

The role that slavery played within the colonial northern iron industry should encourage labor and social historians to consider slavery and free labor as systems that developed and were defined historically in relationship to each other, rather than as mutually exclusive categories.³⁸ At furnaces and forges in southeastern Pennsylvania and New Jersey, which were the largest single employers of both waged and enslaved labor during the eighteenth century, the two systems met and coexisted side-by-side. Finally, the events that transpired in the decades before the Revolution at places such as Coventry Forge and Hopewell Forge demand that students of early industrialization pay closer attention to slavery's part in enabling entrepreneurs to harness white and black workers to the demands of capitalism. Black bondage permitted ironmasters to bring industrial discipline to the countryside of Pennsylvania and New Jersey.

Notes

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26. "Handled" means that a master finer

assisted by manipulating the metal under the trip hammer.

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37. Mary Schweitzer discusses the role of the iron industry in promoting the development of a waged labor regime in Pennsylvania in *Custom and Contract: Household, Government, and the Economy in Colonial Pennsylvania* (New York, 1987), 49-54.

38. Here my thoughts have been influenced by David Roediger's arguments on race and the development of a white working-class identity in the United States in *The Wages of Whiteness: Race and the Making of the American Working Class* (New York, 1991).