

9.1 South view illustrating work to the south of the blast furnace, September 2, 1949. (Photograph 103 by Richard Merrill, 1949.)



## *Miscellaneous Features and Structures*

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In addition to the various industrial structures (see Chapters 5, 6, 7, and 8), Roland Robbins discovered numerous other features that were also part of the ironworking complex. Robbins correctly identified some of these components and the architects incorporated them into the reconstructed ironworks. For others, however, Robbins was only able to describe and document their presence. Fifty years of hindsight and reflection have helped in the identification of some remains, but many remain a mystery. This chapter discusses several of the miscellaneous finds unearthed by Robbins during his excavations including the wharf area, the charcoal house, various foundations, and precontact deposits.

To understand the function of many of these miscellaneous features, it helps to know where the archaeological remains were found on the landscape. By considering the physical relationship of one feature to another, insight can be gained as to how the ironworks system would have functioned as a whole. From its inception, Saugus was designed to function as an integrated system, even incorporating elements from other sites. For this chapter, the furnace shall serve as the center point of the map and other discoveries will be discussed according to their cardinal direction from this central ironworks component. For the most part, Robbins discussed his findings in much the same way, although he often excavated in several areas at one time.

### **Features and Artifacts to the South of Blast Furnace**

Following Robbins' initial discovery of the furnace, he began to branch out with his excavations and first turned his attention to the area south of the furnace. He began uncovering additional features when he sunk a test hole in an area approximately 40 feet south of the southwest corner of the furnace foundation. It was here that Robbins found a foundation with two joining perpendicular walls (Foundation #2 in Robbins' notes).<sup>1</sup> He uncovered evidence of the furnace tailrace, as well as a building possibly spanning the tailrace in this area. He calculated that the building was approximately 14 feet wide with a hammer located in the southwest corner. A forge is also described as being located 22 feet east of this area.<sup>2</sup> Little additional information is recorded for this building, but in a later log entry, Robbins notes that Foundation #2 may also have been used to retain soil along the western hill slope (along what was then Central Street).<sup>3</sup> The location of these discoveries was, however, just to the north of the buildings later identified with Joseph Jenks (see Chapter 7) and may relate to the Jenks' complex.

*Monday, June 27, [1949]. Continued to work east clearing soil from about new wall found 22' east of junction of 2 walls 40' southwesterly of furnace's southwest corner. Also continued to work east of here, bringing the soil down to the level of the era in which the Iron Works operated. I continued to excavate the area 55'-60' southwesterly of furnace. It appears that the tailrace continued a straight course it followed through this building [and] has been filled with a reddish gravelly soil. This soil had slag and metal evidence in it. Possibly when this building was dismantled the tailrace timbers were also taken off. The depression left by removing the tailrace was later filled with soil I have mentioned. It would not surprise me if I find the tailrace went through a building about 14' in width in which (at its southwestern corner) was located a hammer. The foundation being excavated 22' east of this area may prove to be the site of a forge. If such is the case then we may find that 1 wheel (a turbine) furnished power to operate both a hammer as well as a bel-lows for a forge.*

Roland Robbins, "Saugus Ironworks Daily Log - 1949," June 27, 1949.

The wharf for Saugus was found fairly late in the project, although Robbins speculated in July and August 1949 that he had uncovered remains of the wharf along the Saugus River.<sup>4</sup> Some of the early maps made by Bradford illustrate an area adjacent to the Saugus River and identify it as a wharf area, but the use of this terminology was rather quickly abandoned. The real wharf and dock area began to be uncovered during the 1952 and 1953 fieldwork.

When the entire length of the base sill for the wharf was unearthed, Robbins found it to measure just shy of 181 feet in length, running from east to west.<sup>5</sup> It was located well to the south of the forge and slitting mill. Robbins uncovered numerous oak timbers laid end to end along the 181-foot stretch. These base sills had mortises, or slots, cut into them about every two feet to receive the tenons from the uprights. Robbins also uncovered several dead men, or braces, crossing the base sill at perpendicular angles and extending well to the north, in an area that would have been covered by fill to elevate the ground behind the wharf to a level well above high tide. Robbins comments on the construction:

A trench had been dug into the natural peat in which the dead man was buried. The gravel fill had not taken place at that time—or at least it had not advanced south to this point—for the trench had been backfilled with peat, not gravel, nor a mixture of peat and gravel. The northerly end of the dead man was buried in 2 ¼' + of peat. (See Kodachromes for Thurs. am, 3/26/53.) The gravel fill took place *after* the dead man had been buried in peat. Later the slag heaps extended over the gravel fill.<sup>6</sup>

The peat probably acted as a preservation agent by maintaining a constantly moist environment around the structural members. The peat would have mitigated moisture loss due to tidal fluctuations and preserved the wood much longer than if it had been allowed to dry out with the ebb and flow of the tide. Robbins goes on to comment:

Another interesting observation concerns the oak piece used for the dead man. It had been a log which boards had been cut from. The saw marks are clearly visible. When it became too thin to produce more boarding, it was utilized as a dead man. The dead men which retained the yard base sills were whole logs which had notches cut in both ends, one end to fit over the base sill, the other to fit into a notched beam buried in the fill soils. This piece did not have the girth to permit notching. So they cut a rectangular hole thru it near its northerly end and drove a wooden stake thru the hole. The stake in turn was reinforced with a wooden piece to its south side which was running at a right angle to the dead man. This piece in turn had medium size stones to its south side which helped to anchor it more firmly.

*The westerly end of the sill with its uprights and sheathing was set in a trench dug into the peat. No dead men, or heavy stakes were driven to the south side of the sill to stabilize it at this point. Being embedded in natural peat proved sufficient anchorage here. The south side of this trench terminated about 5' east of east surface of most westerly upright.*

Roland Robbins, "Supplementary Yard and Dock Sill - 1953 [file]," April 3, 1953.

9.2 Photograph of the bulkhead sheathing and uprights for the wharf east of the slag pile, October 8, 1951. (Photograph 839 from the Roland W. Robbins slide collection, 1951, Saugus Iron Works. Courtesy The Thoreau Society® Collections at the Thoreau Institute at Walden Woods.)

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It is interesting to note that the wooden piece used to reinforce the stakes had a tenon on either end with dowel holes thru the tenons. This piece had been cut for some other purpose. Having not been used as originally intended, it was utilized here. This supplements similar wooden evidence found about and under the dead men in the yard area. In some instances the dead men had been propped with oddly cut wooden pieces. Similar pieces were also found in the fill soils there.<sup>7</sup>

Behind the uprights were oak planks stacked on top of each other to form a sheathing for the wharf to contain the fill. Robbins describes some of these uprights as being preserved to a height of approximately seven feet above the base sill.<sup>8</sup> Steve Whittlesey, Robbins' assistant who succeeded him after his resignation, notes on a September 10, 1953, sketch that at least a couple of the tenons from the uprights that had been sheared off in the base sill mortises still had one and a quarter inch dowels securing the tenons to the base sill.<sup>9</sup> While remnants of a top sill capping the uprights were not found by Robbins, they would have been part of the original wharf construction. Robbins believed that the uprights and sheathing maintained a height of approximately seven feet until they reached the western side of the forge's western tailrace.<sup>10</sup>

Whittlesey also notes that the wharf had stonework in front of it on the water side. Only along the western portion, however, was Whittlesey willing to call this stonework a wall. "Here, the thickness at the bottom (top of sill) is about two feet, tapering somewhat toward the top, with the stone layers bearing the weight of those above them in the accepted manner of stone walls."<sup>11</sup> As it progressed from west to east, the wall began to look more like rip-rap. Robbins notes that the stones comprising the wall were primarily composed of "Rock Mine Ore," a term used to indicate a stone or ore used in the iron manufacturing process.<sup>12</sup> It is interesting to note that even with a dynamic environment like the one exhibited in the Saugus tidal basin remains from the original wharf survived for 300 years. Large portions of the wharf were preserved in place despite tidal fluctuations and frequent flooding. This is a credit to the original construction techniques.

During the Saugus excavations, Robbins also uncovered evidence of the dock and boat basin between the wharf and the slag pile. The boat basin and the excavations for it are mentioned in Robbins' notes for 1951. This basin and adjacent dock would originally have been large enough to accommodate a boat either bringing raw materials in or shipping finished products out. The basin would also have had to be deep enough to float a vessel, fully loaded, at low tide. Robbins comments in a March 1953 log entry:

In examining the stones which were removed from the fill at the dock basin (this work done late in 1952), I find that about 90% of them are Rock Mine Ore. This would suggest the possibility of this ore having been brought in by barge. It was hard to define

*Possibly the 10% or so of stone evidence found here came from the top of the stone wall which was built above the yard sill, just east of where the forge westerly waterway passes. A study of the gravel fill above the natural peat at westerly end of the yard-dock sill, and the elevation of its surface, will show to what height (minimum) the sheathing extended there. (Possibly the stone wall was constructed of much "Rock Mine.")*

Roland Robbins, "Supplementary Yard and Dock Sill - 1953 [file]," March 24, 1953.

**9.3 Robbins at the wharf. Notice the sheathing and deadmen still intact. (Photograph 531 by Richard Merrill, 1951.)**



the nature of these stones when found because of the black stain upon them. During the past several months, their exposure to the weather elements removed the black stain, revealing their identity.<sup>13</sup>

Excavations in the larger tidal basin area provided substantive information about how river travel would have worked. Saugus was located along a river, but close enough to the coast to be affected by tidal fluctuations. Ultimately this meant that at certain times of the day, more water was present in the tidal basin than at other times of the day. Seasonal fluctuations also occurred, making the basin a dynamic environment that could be shaped by the early settlers, but in no way controlled. Flooding either from seasonal rains, winter snow melts, or dam failures were especially destructive to industrial operations like the ironworks. Robbins notes in a November 25, 1952, entry that he used a clam-shell dredger to open a test trench to the south of the coffer dam constructed during the restoration work in the dock area. The clam-shell trench was dug to determine if a channel had ever been dredged by the original ironworks operation to allow access from the river to the dock.<sup>14</sup> No channel was ever identified, but stratigraphic evidence led Robbins to believe that the larger tidal basin had undergone modification when the ironworks was constructed.

In order to reconcile the elevation of the wharf area and that of the waterwheels found in the Jenks area, Robbins and Dr. Elso Barghoorn from Harvard University's Biological Laboratories speculated that the conditions in the 1950s were not the same as in the middle of the seventeenth century.<sup>15</sup> They questioned whether the land had subsided or the sea level had risen, or whether both had occurred.<sup>16</sup> It was believed that the water level at the time of the ironworks was approximately three feet lower than at present. The water level became a major point of contention late in the project when the First Iron Works Association (FIWA) was recreating the entire basin area. Robbins discussed the problem with architect Conover Fitch in June 1953 and detailed the conundrum in his daily logs.<sup>17</sup> The FIWA had two choices. Either it could reconstruct the basin three feet lower than the river bed, which would portray an image of a basin that was always filled with water, or it could raise the level of the wharf and dock to portray a basin that was wet at high tide and dry at low tide. Ultimately, a compromise between the two alternatives was chosen by constructing a small dam downstream.<sup>18</sup> This small dam mitigated the effects of tidal fluctuations and allowed the water to drain more slowly from the recreated basin.

### Features to the North of Blast Furnace

During the course of excavations to the north of the furnace, Robbins found the remains of two buildings, several waterways, and a small holding pond. Because of its contents, one of the buildings was easily identifiable as the charcoal house. This structure was identified by Robbins in the backyard of Al Yanofsky's house (the old Scott House) in October 1950.<sup>19</sup> The charcoal house was located just under two

*Thursday, June 25 [1953] . . . Fitch and I spent the morning going over details relative to the yard-dock area. We agreed that there is not need to build a road from the dam to the yard area at the time being. This can be done six or so weeks from now. We are seriously considering the elevating of the yard-dock sills to the level of the present river bed. To do this would mean that there would be less contrast between certain restored areas. If we restore the river bed of three centuries ago, where it abuts yard-dock areas, etc., it means this area will be about three feet lower than the present river bed. It will always be under water, even when the tide is out AND THE PRESENT RIVER BED IS DRY. This will convey the impression that a body of water (similar to the basin) existed over a large area. To elevate the base sills of the yard-dock area, as well as the westerly waterway from forge, etc., to the elevation of the present river bed, which is about at el[evation] 8., would mean the entire river bed would be visible when the tide was out. The river bed would abut the yard-dock area, etc., and the restored basin would be clearly defined by its pool of water. While this seems to be a meritorious idea, we shall have to consider it from all angle[s] so that it will not present an unforeseen complication during later developments.*

Roland Robbins, "Saugus Ironworks Daily Log - 1953," June 25, 1953.

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9.4 Looking out over the tidal basin and down the Saugus River in September 1951. (Photograph 782 from the Roland W. Robbins slide collection, 1951, Saugus Iron Works. Courtesy The Thoreau Society® Collections at the Thoreau Institute at Walden Woods.)



hundred feet from the blast furnace, close enough to provide a ready supply of charcoal but far enough away to avoid sparks from the furnace. It was not until the very end of the month, on October 31, 1950, that Robbins made extensive notes on this discovery. In the log entry, Robbins notes that portions of the east, north, and south walls were destroyed by later construction, but that parts of the north, west, and south walls were found intact and in good condition.<sup>20</sup>

At one place on the north wall, Robbins describes the foundation as covered by 23 inches of soil. Here the wall measured 29 inches deep and was well constructed, with approximately fifty percent of the stones containing cut surfaces; the remaining charcoal bed inside the structure near the north wall was 45 inches deep. The northwest corner of the building had been impacted by a later feature and was not as well preserved as the spot on the north wall just described. The wall was only preserved to approximately 18 inches in the southwest corner of the building. Here, Robbins reports finding approximately two feet of charcoal deposited on top of gravelly, sandy soil. The south wall of the house could not be carefully studied because of tree roots but Robbins was sure that he was able to identify the corner of the building. Along the south side of the building, he thought that he could identify a sloping surface beneath the charcoal and speculated that this was the opening to the building.<sup>21</sup>

In addition to the excavations Robbins used to identify the walls of the house, several test holes were dug. The first one reported was Hole A, excavated at the juncture of the east and south walls. Disturbance here is noted to be seven feet, eight inches deep. No pattern was apparent among the stones found in this hole. Robbins then reports that he began tunneling to the west, eventually breaking through to Trench 6, located about six feet to the west. In this tunnel, the excavators reportedly uncovered brick and cinders from the ironworking facility. In another hole, further to the north and at a spot that approximates the northeast corner of the structure, Robbins found evidence that was difficult to disentangle. He thought that the remains might represent the northeast corner of the structure.<sup>22</sup>

Overall, Robbins estimated the structure to have been 27 feet long. He never mentions a width, but the sketch map that he included with the description shows it to be about 20 feet wide. Below the charcoal in the northern portion of the building, Robbins found a sandstone spike. This spike was similar in appearance to ones found at the furnace. It had a glaze on it indicating the likelihood that it had been used in the furnace. Robbins notes that its position below the charcoal suggests that the furnace had been in operation long enough to produce a burned lining before the remaining charcoal was stored here, or before it was used as a charcoal house.<sup>23</sup>

Another foundation was uncovered by Robbins in the middle of Marion Road in September 1950.<sup>24</sup> These remains were located in front of Clyde Robinson's house. While the majority of the foundation was found in the street, Robbins reports that some of the remains continued into Robinson's front yard.

*Undoubtedly the area about the easterly end of the charcoal house, as well as along a section of the easterly end of the charcoal house southerly wall, had been disturbed by a later generation—and to a depth exceeding the elevation of the easterly end of the charcoal house. The coal and cinders and the fact Scott owned this property would suggest that Scott may have created the disturbance. To properly evaluate who disturbed what and when would necessitate more extensive excavations. We would have to carry away much of the excavated soil to permit proper working conditions. This work cannot be done under present arrangement with owners and tenants. All artifacts found in excavations at test holes A will be found under relics for this date.*

Roland Robbins, "Saugus Ironworks Daily Log - 1950," October 31, 1950.



The discovery put an earlier controversy to rest. Edward Guy, the blacksmith who had lived and worked in the area, had told Robbins early on that when the water pipe had been buried below the street in about 1942, the crew excavating the trench had broken their mechanical shovel trying to get through the stone foundation. Although the contractor that excavated the trench couldn't remember encountering any large stones, the discovery of the remains validated Guys' remembrances.<sup>25</sup>

Evidently the contractor had cut through the west wall of the building and had torn out a considerable amount of the south wall. The stones in the foundation are described as quite large and mortared. Brick, plaster, and nails were found within the foundation; it appeared to Robbins that the bricks and nails and the robust construction of the foundation would make it of a later date, rather than being associated with the ironworks period, unless the original remains had been reworked at a later time.<sup>26</sup>

It is very difficult to evaluate Robbins' conclusions about this foundation from the available evidence. Several photographs, a sketch map or two, and a brief description certainly do not qualify as adequate documentation. The stones used in the foundation do appear quite large in his illustrations. Based on the placement of the east and west fragments of wall, Robbins estimated the building to be about 32 feet long; no width is given.<sup>27</sup> There remain two possible interpretations for the building. First, that Robbins was correct and that the building dates to later than the ironworks period, or second, that the building dates to the ironworks period and was reused at a later time. If the remains were originally part of the ironworks and later reused, it may be one of several missing buildings from a theoretical ironworks landscape, perhaps an office, barn, or storage shed. Unless additional excavations are undertaken, one may never know the date or function of the building.

Also to the north of the furnace, Robbins located what he thought was a basin to contain water before it was used to power the buildings in the industrial sector. This basin, of unknown size, would have served as an intermediary water-containment device, positioned between the canal from Pranker's Pond to the north and the industrial buildings to the south (see Chapter 8). Robbins speculated that the four raceways that he eventually identified as watercourses that provided water power to the buildings originated at this holding pond. He notes in a November 1952 entry that banking for the basin had turned up in one of his test trenches.<sup>28</sup> Because of grading done for the driveway for the Eastern Industrial Oil building, he thought that it would be difficult if not impossible to determine the northern extent of the basin. Robbins theorized that if the basin and banking extended all the way to Clyde Allen's property, it might be found archeologically. No evidence of earlier ironworking activity appeared in the southern portion of the trench, indicating that the basin was constructed before the ironworking activities began at Saugus. However, Robbins notes that he found ironworking materials on the eastern side of the banking, including bricks. No additional excavations were done in this area because he judged these deposits to be later than the ironworks period.<sup>29</sup>

*Oct. 24, Tuesday [1950] . . . The soil westerly of this 37' trench was disturbed, apparently because of a building which was built just beyond at one time. (The southerly wall of this building was found in Marion Rd. Its inside measurement (distance between its westerly and easterly walls) was 32'.) We could not follow its easterly and westerly walls because they run under Clyde Robinson's front lawn. This wall clears up an old controversy. Mr. Guy claims he saw large cut stones here when the original water main was laid about 1942. And the contractor broke his shovel when digging through them. This proves Mr. Guy's statement to be correct. The contractor had cut through the west wall when digging for the water line. Not realizing he was cutting through a building foundation—and was running quite parallel with its southerly wall, he tore out more than one half of the southerly wall when digging the water line trench. The stones in this foundation were nicely cut, and quite large. They were mortared. Within this foundation we found bricks and plaster. Bricks, plaster and mortar from the foundation were saved.*

Roland Robbins, "Saugus Ironworks Daily Log - 1950," October 24, 1950.

**9.6 Robbins examining the building foundation discovered below Marion Street, September 27, 1950. (Photograph 233 by Richard Merrill, 1950.)**



### Features to the West of the Blast Furnace

It wasn't until 1950 that Robbins began excavating the area west of the furnace, past the wheel pit and tailrace. He began making interesting discoveries in January 1950, when he located considerable amounts of iron-bearing rock and flux (coral and shell) in an area a few feet south of the ironworks sign on the plateau of the ridge above the furnace.<sup>30</sup> Half a nail barrelful of coral (Robbins often assessed quantities this way) and a few clam shells were uncovered in this location, as were a 37-inch-long sow, stone and iron-ore rubble, and fired clay. Robbins notes in a January 1950 entry that these discoveries might signal the location of a forge, firing activity area, and/or ore shed.<sup>31</sup> After a few days of additional excavation, Robbins became convinced that the remains were that of an open forge, with the open side facing to the south or southeast. He acknowledged, however, that the assemblage of materials recovered from the site might better represent smelting activities rather than forging operations.<sup>32</sup>

Later, in June 1953, Robbins located what he interpreted to be an anvil block on the plateau of the ridge above the furnace.<sup>33</sup> The anvil block was located at the northern end of the western stone wall lining the ridgeline of the plateau. On the afternoon of June 9, 1953, the site was visited by iron specialist Charles Parker, historian Neal Hartley, and a Professor Chippendale (first name not given) from MIT. These individuals thought the remains that Robbins discovered on the eastern side of the wall were probably the remains of roasting ovens, but they had a difficult time reconciling why an anvil block would be found near this area.<sup>34</sup> Robbins notes his skepticism about this interpretation in his log entry, yet Hartley, Parker, and Chippendale's interpretation seems to be better supported by the available evidence than does Robbins'.<sup>35</sup>

It seems that one must look at a larger area to understand these remains. If they were the remnants of a forge, why did the ingredients for smelting iron show up in such quantities? If this was the site of a forge, where was the power source and why are other features and artifacts associated with a forge not also found? The lack of good answers to these questions casts doubt on Robbins' interpretation. If the remains were not a forge, what were they? To answer this question, the remains uncovered along the plateau ridgeline must be examined, along with the corresponding lack of industrial remains on the top of the plateau.

The production of iron required raw materials, including charcoal, iron ore, and flux, to be gathered and stockpiled (see Chapter 1). Once the furnace was in blast, it required nearly constant feeding to produce iron for months on end. Allowing iron ore and flux to weather removed impurities and made the production of iron easier. In some cases, the iron ore and flux were allowed to age for a considerable time before they were put into the furnace. Charcoal, on the other hand, needed to be covered and shielded from sparks from the blast furnace.

*Friday, Jan 27 [1950] . . . Found a considerable amount of iron rock evidence. There appeared to be a number of different types of iron rock. It will be interesting to learn if this is the case—and just where these ores were available. I found one-half a nail barrel load of coral, some pieces of good size. A few pieces of clam shells were also found. A large section of sow 37" long was found amid the stone and ore rubble. In the same rubble was found clay and charcoal evidence. The clay evidence had turned red by heat, apparently, must have been within forge or similar firing activity. I don't believe it was from furnace activity, no burned sandstone etc. or red clay packing pieces. Fact is the clay evidence found today was granulated. The diggings today were but several feet southerly of I.W. sign.*

Roland Robbins, "Saugus Ironworks Daily Log - 1950," January 27, 1950.



9.7 The location of the controversial forge/furnace findings adjacent to the tercentenary sign, late January 1950. (Photograph 328 by Richard Merrill, 1950.)

Looking at the layout of the site from a strictly economic perspective, a basic plan or organization for the Saugus ironworks becomes apparent. While an economic explanation does not necessarily work for all sites, especially those that predate capitalist economies and industrialization, it does seem to work here. To maximize the output of the blast furnace operation, ironworks managers Leader and later Gifford would have organized the production in the most efficient manner possible. Since the location of the charcoal house less than two hundred feet from the northwest of the furnace was confirmed by Robbins, it is very likely that piles of iron ore and flux were also kept in the vicinity despite the lack of archeological evidence. From a pragmatic perspective, very large piles of raw materials would have been needed very close to the blast furnace, probably somewhere on the plateau. The laborers connected with the ironworks would have constantly drawn on these raw material piles to feed the furnace 24 hours a day and seven days a week so that the lining of the furnace would not need to be rebuilt. It was expensive and time consuming to rebuild a furnace, so the owners and managers of ironworking sites endeavored to keep the furnace in blast for as long as possible. This would have meant creating huge stockpiles of raw materials.

In all likelihood, the raw materials (iron ore and flux) would need to be broken down into smaller pieces for aging, roasting, and ultimately delivery to the furnace. Some processing of the raw materials would likely have occurred on site. An anvil and a hammer of one form or another were likely used for this purpose, making it logical that Robbins found an anvil base in conjunction with what Hartley, Parker, and Chippendale interpreted as roasting ovens. The anvil base may have simply been used to refine raw materials for roasting, aging, or processing. The discovery of a sow in this area does not cause concern because remelting was common if the original cast was considered subpar. Even the sow would have needed to be broken up into pieces for more efficient processing.

These piles of iron ore and flux would likely have been large enough to continue operations during short-term, intermittent supply disruptions. If the materials were being aged to reduce the amount of impurities present, then the piles would have needed to be much larger than if they were used shortly after being mined. These stockpiles, in either case, would likely have been quite large and would have occupied a prominent feature on the landscape. Given the need to load the furnace from the plateau, this would have been the ideal location for the stockpiles.

It seems highly likely that iron ore was available at or very near the site. If Leader had done his job effectively when he scouted out the site for the construction of the ironworks, he would have searched for a location that provided an ample water supply, a drop in terrain that would accommodate a furnace and other ironworking buildings, hundreds if not thousands of acres of forested land, and a nearby source of raw materials. Since the Massachusetts Bay Colony had granted the Undertakers a monopoly on iron production and because iron was such an important commodity for the developing colonial economy,

*In the general vicinity were low-lying meadows and swamps containing bog iron ore of good quality. Hard by the bridge which carried the main road between Boston and Salem over Saugus River was a kind of natural amphitheatre, so situated that on fairly level land washed by the stream a furnace could be erected with adequate water power and easy charging from a natural elevation rising above the riparian plain. At high tide Saugus River was navigable right up to the site in question. Handy as the place was to the growing towns of Salem and Lynn, Charlestown and Boston, it was not far from the common lands of Lynn, much of them covered with stands of virgin timber promising an almost inexhaustible store of wood for charcoal and construction work. One can easily conjure up a picture of Richard Leader standing at the top of the amphitheatre and announcing, "This is it!"*

E. Neal Hartley, *Ironworks on the Saugus*, pp. 123-24.

9.8 November 1942 photograph of the stockpiles of coal and iron ore for the Hanna furnaces of the Great Lakes Steel Corporation. (Photograph by Arthur Siegal. Library of Congress, Prints and Photographs Division, LC USW3-011208-C [P & P.]





the government would likely have supported the industry in any way it could. Leader therefore had both the backing and the incentive to wait until he found the absolute best location for an ironworks. He could have afforded to be very choosy about the final site. It seems highly doubtful that he would have picked a site where the primary component of iron making would have needed importation.

The possibility that the cranberry bog was a source of iron ore for the plant makes the selection of the ironworks site even more logical. Robbins argues this point in his July 17, 1951, log entry.<sup>36</sup> In addition, local legend held that the cranberry bog was the remnant of iron-ore mining activity. If iron ore came from the cranberry bog, it would have been fairly easy for Saugus to build up a substantial stockpile of ore and to circumvent any disruption of supply, at least until the source in the bog was exhausted. The mined ore could have then been aged on site until needed for the furnace. The bog is large enough to have supplied iron ore for years. Ethnographic accounts given to Robbins by men who had discovered bog iron ore at the site provide additional support for this interpretation.<sup>37</sup>

Other raw materials like flux and charcoal would not have been as important in determining site selection. After the immediate woods around a site were exhausted, charcoal would have been brought in from the nearby countryside. The monopolistic grant awarded to the Undertakers also contained provisions for surrounding woodland to support the ironworks. Fluxes could be derived from many different sources and were required in smaller proportions than ore or charcoal. In terms of a purely economic labor model, it would have been most important to locate the facilities near an iron ore source and close to an adequate charcoal supply. Fluxes were the least important commodity and could be imported if necessary. Saugus met all of these needs and provided a terminus for importing flux by water, a cheaper and more effective method of transportation than overland routes.

Although not essential for smelting iron, clay was another essential raw material for the casting of various ironwares. Clay was used in a variety of contexts at the site, but most notably in molds for making cast-iron products, mainly hollowwares. The closer that a good source of clay could be found, the greater the profits from the undertaking, because importing the raw materials cost money. It is interesting to note that in Robbins' April 30, 1950, log entry he records the presence of a clay deposit on Bridge Street.<sup>38</sup> Earle Smith, one of the consultants hired for the restoration project, told Robbins that Saugus would likely have had three years of clay supplies on hand. Clay also needed to weather to develop more plasticity; Smith told Robbins that in England some clay was weathered for as much as five years. Smith thought that the clay discovered on Bridge Street would have made good molding clay. Hartley noted that a local clay source such as this one may account for the lack of any entries for carting clay in the historical documents.<sup>39</sup>

*Oct. 20, Friday [1950]. . . . This muck smelled sour, similar to soil found on mud flats when the tide is out. Dr. LaForge and Neal Hartley both examined this soil and agreed it was indicative of a pond bed. No evidence of bog ore was found in this muck. This observation contradicts some contemporary (hear-say) historians belief that this was a bog ore pit. This hole was more than 10-1/2' deep.*

Roland Robbins, "Saugus Ironworks Daily Log - 1950," October 20, 1950.

9.9 The cranberry bog, February 1950. (Photograph 344 from the Roland W. Robbins slide collection, 1950, Saugus Iron Works. Courtesy The Thoreau Society® Collections at the Thoreau Institute at Walden Woods.)

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### Features to the East of the Blast Furnace

The two most important finds made to the east of the blast furnace were the forge and the slitting mill (see Chapter 6). These two structures and their component parts completed the industrial triad of iron-working facilities. Substantially more archeological evidence was found to document the presence of the forge than the slitting mill. Other features including a possible warehouse and a corduroy road were recovered to the east of the blast furnace.

Robbins notes discovering the foundations to what he termed a warehouse between the blast furnace and the Saugus River, in 1949. He numbers this discovery Foundation #6 and argues that the walls were at least contemporary with the slag and thus the ironworks.<sup>40</sup> In a November 9, 1949, entry Robbins speculates that the wooden tank found within Foundation #6 may have been used for tanning.<sup>41</sup> Leather for the bellows and other animal products like cattle hair for waterwheel caulking were necessary for the ironworks operation. Robbins seems to have abandoned his investigation of this building until August and September 1952, when he began excavating in and around the foundations. He then discovered numerous large stones and some fragmentary wood remains associated with the building.<sup>42</sup> Robbins' artifact cards indicate that a tin pot and leather remains were also found in or around the building, although the stratigraphic integrity associated with these artifacts is somewhat uncertain.<sup>43</sup>

Several maps in the Saugus archive illustrate the location of Foundation #6. The remains were located in front of the forge, just to the west of the well. The log entries from late 1952 seem to indicate that the building may have spanned the tailrace on the eastern side of the forge.<sup>44</sup> The warehouse that was reconstructed at Saugus was not located on the remains of this building. Instead, a much diminished warehouse was constructed south of the building remains.

Another miscellaneous feature that Robbins discovered east of the blast furnace was the so-called corduroy road. This log feature, located just to the south and in front of the slitting mill, is briefly mentioned in the May 19, 1952, log entry. It may have been used to stabilize a roadway adjacent to a spring located just to the north of the road.

Paul found base sills just S.E. of old well which is easterly of foundation #6. The sapling pieces, laid out like [a] corduroy road at S.E. side of one of sills. To northeast of most S.E. sills more wood is noted running N.W.–S.E. It has stone over it. As such the stone work is being removed along course of wood to determine its length and significance if any. The stones have Iron Works activity beneath them.<sup>45</sup>

*Friday, July 29, [1949] . . . Continued to excavate for wharf site. One or two observations concerning foundation #6. Slag fill at river backs to outer side of foundation #6 southern wall where its depth is about 2'. Inside the foundation #6 area no slag is found. The fact this slag abuts the wall is indication that the wall ant[e]-dates, or is contemporary, with slag fill, possibly both having been undertaken at about the same time . . .*

Roland Robbins, "Saugus Ironworks Daily Log - 1949," July 29, 1949.

9.10 The wooden tub associated with Foundation 6, November 1949. (Photograph 261 from the Roland W. Robbins slide collection, 1949, Saugus Iron Works. Courtesy The Thoreau Society® Collections at the Thoreau Institute at Walden Woods.)

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While the road is a prominent reconstructed feature at the Saugus Iron Works, it is barely mentioned by Robbins in his log. Even though he indicates that the corduroy road had stones over it, the reconstructed road lacks the stonework.

The east bank of the Saugus River, across from the ironworking facilities, is a kind of tabula rasa. Robbins never conducted substantial excavations in this area as he did to the west. Photographs taken late in project show a large amount of fill being brought in to raise the grade of the east bank behind the stone wall at the river's edge. While little is known archeologically of this area, this location may have contained some of the missing structures thought to be associated with the ironworks or for housing its employees. However, since all of the buildings seminal to the story of iron production at Saugus turned up on the west bank of the river, neither the FIWA nor the Reconstruction Committee saw a reason to focus research on this parcel of land. Archeological excavations done since Robbins' time have provided little new information.<sup>46</sup>

#### **Burials, Miscellaneous Finds, and Ethnohistorical Accounts**

A great deal of folklore and many anecdotes and ethnohistorical accounts made their way into Robbins' log entries. Because the accounts often lack details, it is difficult to judge their value for understanding the Saugus Iron Works site. Neighbors and interested locals often informed Robbins of discoveries in the neighborhood. For example, on August 11, 1949, Mr. Russell of 223 Central Street told Robbins about a pipe near the river where he used to fill jugs. He also told Robbins about a stone-lined well in Mr. Yanofsky's cellar (the site of the Old Scott House) that Russell had filled in. Mr. Russell also told Robbins about falling through what appeared to be an old ice-or cool house, the remains of which were now under Mr. Robinson's house.

Burials at the site had been reported for years and anecdotal accounts of them also made their way into Robbins' notes. One of the most frequently mentioned accounts concerned a purported burial next to Lovell's garage. In the August 11, 1949, entry in his log, Robbins relates a conversation he had with Mrs. Lovell. Evidently, James Staziniski, the builder of the Lovell house, had called Mrs. Lovell and told her that during construction of the house he had found a building foundation, a number of coins (two-cent and three-cent silver pieces), and a grave on the side of Lovell's garage facing Marion Street. Subsequent investigations by Robbins failed to locate this burial. However, National Park Service staff has reported other anecdotal accounts of burials at the site, one purportedly up next to the museum. According to staff, a burial was supposedly found there with a large cache of arrowheads, although no written account of this exists.

*The portion of the Iron Works property on the east bank of the Saugus River is archeologically virtually unknown. Although it has been subject to disturbance, the possibility of intact archeological deposits remains. These deposits may include the remains of important, but presently poorly known, groups such as Native Americans and ironworkers and their families.*

Eric Johnson, *Archeological Overview and Assessment of the Saugus Iron Works National Historic Site, Saugus, Massachusetts*, p. 68.



9.11 The excavation of the corduroy road timbers and associated bridge, November 11, 1952. (Photograph 746 by Richard Merrill, 1952.)

Robbins makes several references in his log entries to prehistoric deposits near the river in the industrial area of the site. He mentions shell found in conjunction with lithics. Professional archeologists today would consider this a key determinant and probably refer to it as a shell midden. In a June 10, 1953, entry, Robbins likewise refers to Indian ash pits found below the working surface to the south of the slitting mill.<sup>47</sup> A brief perusal through the prehistoric collections made by Robbins and curated at the Saugus Iron Works indicates the great variety of tool types and lithic sources used in prehistoric tool production at the site. Robbins even called the Massachusetts Archaeological Society in to excavate prehistoric features, to no avail.<sup>48</sup> The variety of stone types in the collection is truly remarkable.

While the wharf, dock, and tidal basin were eventually reconstructed by the FIWA, other features like the charcoal house, raw material stockpiles, water-holding basin, and bog-ore mining areas, and the Jenks area never were. Part of the problem lay in the fact that many of these features were located on land not owned by the FIWA. It is somewhat unfortunate that many of the miscellaneous features that could be identified were not reconstructed at the same time as the furnace, forge, and slitting mill. It makes for a rather incomplete picture of the facility. Visitors take away a very biased representation of how the site looked in the mid-seventeenth century based only on the three reconstructed industrial buildings (five counting the warehouse and later blacksmith's shop). Places like Hopewell Furnace National Historic Site present a much more accurate picture of what an ironworking site may have looked like, although Hopewell dates from a later period and was not in a ruinous condition like Saugus when it became a park. The presence of a collier's hut, charcoal pit, charcoal house, tenant houses, barn, spring-house, etc., provide a more complete representation of the other buildings that would have supported the iron production.

