Hopewell Furnace National Historic Site

Historic Scene Report

Core Village Area

and

Big House Grounds

Researched and Written

by

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1995

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Jeffrey W. Collins
Chief Ranger
1995

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INTRODUCTION

The purpose of this Historic Scene Report for Hopewell Furnace core village area and Big House grounds as defined by the project description for the Eastern National Park and Monument Association Research Grant is "...to gain and analyze data on outdoor furnishings and structural and other cultural and natural elements of the historic scene in the core village at Hopewell." It is expected that the Historic Scene Report will be used in conjunction with the Historic Structures Reports already completed and filed in the Hopewell Furnace National Historic Site Library. Therefore, standing structures and interior furnishings are not addressed in this report. The environs of the core village, outbuildings, outdoor structures (such as fences), field crops, gardens, livestock, and activities which would have taken place outdoors have been documented in this work. Buildings which are no longer standing today, but existed during the interpretive period, have also been researched and included as part of this report. Finally, because the furnace itself was central to the activities that took place at Hopewell, and because its operation had such a profound impact on the Hopewell environs, I have included research of both interior and exterior features of the furnace complex.

CORE VILLAGE AREA

FURNACE COMPLEX

Heated Blast

After searching through Hopewell Furnace National Historic Site's archives, I have found that there is significant historical evidence regarding the furnace which has previously not been provided in any Hopewell Furnace historic structures reports such as the Thomas and Newswanger report or in the Documentation of the Historical Base Maps. There is strong evidence that Mr. Brooke experimented with applying a heated blast to the Hopewell Furnace during the winter of 1837-'38. This was most likely done as an effort to reduce the amount of fuel consumed during blast. In a letter written from Hopewell on April 16, 1838, Ann C. Brooke wrote, "...Tell Miss Clementina that the blaze of the furnace which she admired so much is now entirely excluded by the introduction of the heated blast."[1] The Tenth Census of the United States reported "In 1835 a hot blast oven, containing cast iron arched pipes, was placed on the top of the stack by Mr. Henry, and heated by the flame from the tunnel head. By this arrangement the temperature of the blast was

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[1] Hopewell Document 8380416A, March 16, 1838. Microfilm Roll 361.

raised to 500 degrees. [This refers to the temperature of the air as it entered the tuyere, not to the blast temperature inside the furnace.]"[2] A similar arrangement of cast iron pipes may have been installed at the top of the stack at Hopewell Furnace thereby obscuring the flames from the blast just as Miss Brooke had noted. At that time The Berks and Schuylkill Journal carried advertisements to sell hot air blasts to local iron masters. The Saturday March 17, 1838, issue carried this notice:

> To Iron Masters. Hot Air Blast. The subscriber respectfully informs all those engaged in the manufacture of iron, that he is now fully prepared to erect the improved apparatus for heating air as put in use by Edward B. Grubb, Esq. at Mount Hope Furnace, Lancaster County, Pa. He has with him Moulders, Patterns, Ladles and Flasks, so as to make the necessary pipes at the different works, where his services may be required. This apparatus is in use at a number of furnaces, and gives universal satisfaction.
>
> Letters addressed to the subscriber, Reading Post Office, Berks County, Pa., care of John Schwartz, Iron Master, will meet with

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[2] Tenth Census of the United States Department of the Interior, p.156. As transcribed in the Hopewell Furnace Library's "Historians Research Files." Filed under the heading "Blast Machinery, Data."

prompt attention. GEORGE LAY.[3]

Another individual placed an advertisement in the Saturday April 7, 1838, issue of the Berks and Schuylkill Journal:

> HOT AIR BLAST. The subscriber respectfully informs all persons engaged in the manufacture of cast iron, that he is prepared to erect the Improved Apparatus for Heating Air for Blast Furnaces, on the shortest notice, having procured Flasks, Ladles and Patterns, of the best and latest construction. His apparatus is somewhat similar to that now used by Messrs. E.& C.B. Grubb, esq's. Mount Hope Furnace, Lancaster County, and Codorus Furnace, York County, where the subscriber has been for the greatest part of the last year and where he has made several sets of the pipes for different individuals, from whom he can give the most satisfactory recommendations.
>
> The apparatus with new and valuable improvements will be erected in the best and most permanent manner, and upon moderate terms.
>
> Orders addressed to the subscriber, York Post Office, York County, Pa. will meet with prompt attention. JOSEPH JONES.[4]

An interesting testimonial which was added by the Berks and Schuylkill Journal to Mr. George Lay's advertisement in the April 7, 1838, issue read: "We understand from practical men who have used the Hot Air Blast, that the saving in fuel, may be safely estimated at FORTY per cent. - Ed. B.& S. Journal."[5]

In addition to Ann Brooke's April 16 letter, the Hopewell

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[3] Berks and Schuylkill Journal 12.45 (1838):np

[4] Berks and Schuylkill Journal 12.48 (1838):np

[5] Berks and Schuylkill Journal 12.48 (1838)

Furnace archives has a document dated February 24, 1838, which may refer to work done on the furnace. Unfortunately, this document lacks the detail necessary for positive identification as to what exactly was being done.

Aaron Fisher to Hopewell	
72 ft pipe @.70	50.40
1 day putting up	1.00
to fixing the pipe	3.00
to Hawling [sic]	3.00
	57.40 [6]

One can interpret this document as being payment for iron pipe for the heated blast, and the installation and transportation of the pipe to be used for Hopewell furnace. The high cost of hauling the pipe suggests that the pipe is heavy iron pipe and not a light gage tin pipe. The amount of pipe, 72 feet, is more than necessary for the blow pipe to the tuyere. Hopewell Historian Earl Heydinger estimated the total amount of pipe from the tuyere arch to the receiver plus the pipe from the receiver to the tubs would equal about 45 feet.[7] The east head race would require more than 72 feet of pipe for the underground run from the Big House garden to the waterwheel. Also, the notations "putting up" and "fixing the pipe" does not connote an in-ground water pipe installation. One can speculate that the pipe was used to connect with a cast iron heat collector which was fastened at the top of the furnace stack. The furnace stack is

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[6] Hopewell Furnace Document 8380224A, Feb. 24, 1838.

[7] Hopewell Furnace Library, "Historians Research Files." Filed under the heading "Waterwheel-Blast pipe Data" Earl Heydinger Sept. 1969.

$32^{1}/_{2}$ feet high, if one adds to this number Heydinger's estimate for the amount of blow pipe needed for the blast machinery the total comes to $77^{1}/_{2}$ feet. There is only a $5^{1}/_{2}$ foot difference between this number and the amount of pipe in the Furnace ledger book. Not all of the blow pipe on the blast machinery would necessarily be replaced. However, the pipe may have been used elsewhere such as the mansion, the spring house, or to bring water into the cast house, there is simply insufficient information to be certain how the pipe had been used. The amount of pipe certainly is comparable with the amount that may have been needed to connect the heated blast. Two more documents which may indicate that the blast machinery was being modified for the heated blast are a payment to Birdsborough Forge for piston stems on January 10 and 11 1838.[8] The other being a payment to John K. Wright of Reading for "piecing two plate and setting spring" on November 10, 1837.[9] These two documents indicate that work was done on the blast machinery, possibly modifications done in conjunction with the installation of the heated blast. The three documents taken together with the Ann Brooke letter have the proper chronology to indicate that Mr. Brooke may have modified the furnace and blast machinery for the heated blast beginning in November of 1837 and completed the work by April of 1838. How long Mr. Brooke kept the heated blast at

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[8] Hopewell Furnace Document 8381109, Nov. 9, 1838 (transcribed by Hopewell historian Earl Heydinger '70).

[9] Hopewell Furnace Document 8371110, Nov. 10, 1837 (transcribed by Hopewell historian Earl Heydinger '69)

Hopewell and how successful his experiment may have been remains a mystery, perhaps in the future further documentation will be found to elucidate this matter. The History of the Counties of Berks and Lebanon, published in 1844, indicates at that time there were eight furnaces for manufacturing pig iron in Berks County, of which only three were hot blast.[10] This fact would appear to indicate that by 1844 Hopewell had already gone back to cold blast and that the furnaces which were tabulated as hot blast were three of the much newer furnaces in Berks County. Hopewell is listed among the cold blast charcoal furnaces of Eastern Pennsylvania in 1850.[11]

Hearths

Furnace records indicate that new furnace hearths were often purchased several at a time.[12] The extra hearth stones were probably stored within close proximity to the furnace. Records show that the new hearth stones were "delivered on the bank."[13]

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[10] I. Daniel Rupp, History of The Counties of Berks and Lebanon (Lancaster: G. Hills, 1844) 266

[11] Documents Relating to the Manufacture of Iron in Pennsylvania (Philadelphia: Convention of Iron Masters General Committee 1850)

[12] Hopewell Furnace Document 8310315, "March 15, 1831 Received of M.B. Buckley by the hand of Clement Brooke three dollars and twenty cents, it being in full for four hearth stone @.80 per stone by Tho. Kenny. [signed] George Zerr"

[13] Hopewell Furnace Record SM32 p2a, May 11, 1846 "Furnace Dr [debit] to Lott McMichael for putting in furnace hearth this spring - The hearth stone was delivered on the bank...$35.00"

The hearths were replaced annually and occasionally twice in one year if the furnace was very busy. The relining of the furnace would have been a high profile activity within the community, as numerous loads of building stone were delivered and the old worn-down stone was pulled out of the furnace and hauled out of the way. The Furnace records contain a January 1835 entry, "Furnace Dr [debit] to Barney Hart... for 5 days labor taking out the furnace hearth and inn walls up to this date @ 60 cts p day [.60 cents per day]...$3.00"[14] The next day the following entry was recorded: "Furnace Dr [debit] to John Care for hauling stone from the 8th of Feby. to the 31st of Dec. 1834- for hauling... 19 loads stone for Furnace Hearth, Inn Walls, Boshes etc. @ 10/... 25.33^{1}/_{2}$."[15] Other entries which shed some light on this activity during the 1830's are: "Furnace Dr [debit] to William Mock for hauling done from the 11th of April to the 31st of Dec. 1834... for hauling 5 loads Hearth stone and boshes to Furnace @10/ $6.67."[16] "Furnace Dr [debit] to Abraham Sivert for hauling done from the 1st of May to the 27th of Dec. 1834... for hauling 17 loads of Furnace inn wall stones and hearth stones

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Hopewell Furnace Record SM32 p6b, "Furnace Dr to Jacob Keller as per his acct [account] rendered - for 1/2 furnace hearth delivered on bank...$20.00"

[14] Hopewell Furnace Record SM21 p121b, Jan. 14, 1835. The abbreviation "Dr." signifies debit or debtor, and it most often refers to a debit from the furnace account with a transfer of the funds to Cr. or credit to a workers account.

[15] Hopewell Furnace Record SM21 p122b, Jan. 15, 1835.

[16] Hopewell Furnace Record SM21 p129b, Feb. 6, 1835.

@10/ $22.67."[17] "Sundries Dr [debit] to Thomas Kinney- Furnace, for cutting and putting in the furnace in walls last winter, $70.00. For cutting and putting in the furnace hearth last winter, $50.00. Alexander McCarraher for amount as per his account for assisting him in putting the Furnace Hearth in July last, also for a half Hearth raised by Kinney some time ago and taken by McCarraher, $16.00."[18] "Furnace Dr [debit] to Barney Hart... for 5 days labor assisting at taking out old hearth and putting in the new hearth @.60 per day, $3.00."[19] "Thomas Kinny Dr [debit] to Sundries... to John Young for amount of work done at Furnace Hearth as per his verbal adv. $4.50...to George Painter Jr. for amount of $3^1/_4$ days work at ditto [furnace hearth] @ $62^1/_2$ $2.34^1/_2$."[20] "Furnace Dr [debit] to sundries for work done the first of Aug. last up to this date as per time book- To Barney Hart 1 day at taking out furnace hearth @.60 per day, .60. To George Kephart 6 days at taking out furnace hearth @.60 per day, $3.60."[21] "Furnace Dr [debit] to John Care for hauling 1 load boshes and false temps [tymp stones], $1.50."[22] "Note the Furnace was out of blast two weeks in August last

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[17] Hopewell Furnace Record SM21 p130a Feb. 24, 1835.

[18] Hopewell Furnace Record SM21 p141a, May 30, 1835.

[19] Hopewell Furnace Records SM21 p152a, Dec. 25, 1835.

[20] Hopewell Furnace Records SM21 p152b, Dec. 25, 1835.

[21] Hopewell Furnace Records SM21 p154b, Jan. 1, 1836.

[22] Hopewell Furnace Records SM21 p160, Jan. 19, 1836.

[1836] putting in hearth."[23] "Thomas Kinney Dr [debit] to George Brown for boarding, 2.62½. This acct. was for boarding Thos Kinny while raising 5 harth [sic] stones for Hopewell and 3 stones for Canewango [Conowingo] Furnace."[24]

By examining this selection of excerpts from the furnace ledgers one can see that the hearth was replaced in July 1834, then again in January 1835. Next it was replaced in January of 1836 and again in August of that year. The period from 1830 to 1838 was Hopewell's greatest period of prosperity.[25] The fact that the furnace hearth had to be replaced twice annually reflects the physical wear to the interior of the furnace brought on by longer blasts and increased productivity. Mr. Walker's fine book about Hopewell's social and economic history is misleading in regard to this particular detail. The intense heat during blast slowly burned away the stones. Thus, the longer the furnace was kept in blast the sooner the hearth, in-walls, and bosh would need to be renewed. Using Dennis Kurjack's National Park Service Handbook Hopewell Village National Historical Site[26] as a source, Walker in his book states, "In one blast from January 3, 1836, to April 10, 1837, the furnace operated

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[23] Hopewell Furnace Records SM21 p206a, May 1, 1837.

[24] Hopewell Furnace Document 8370925a, Sept. 25, 1837.

[25] Joseph E. Walker, Hopewell Village: A Social and Economic History of an Iron-Making Community (Philadelphia: University of Pennsylvania Press, 1966) 57.

[26] Dennis C. Kurjack, Hopewell Village National Historical Site (Washington: National Park Service Handbook Series, Hamberg, 1950) 28.

continuously for 445 days and produced 1,169 tons of mixed castings."[27] This statement is repeated in Hopewell Furnace: A Guide to Hopewell Furnace National Historic Site.[28] Technically speaking the statement is incorrect, even if it may seem true in a practical and financial sense. The actual ledger entry reads,

> Hopewell Furnace May 1, 1837.
> Furnace Dr [debit] to Henry Care
> for Blowing the Furnace 14 months & 24 days @
> 45 p month...
> The following is the amt of metal made in the
> above blast:
> viz. Tons 720..09..02 lb castings
> " " 253..10..0..00 pigs
> " " 204..15..0..00 gates
> Note the Furnace was out of Blast two weeks
> in August last putting in hearth. [underlined
> in original][29]

Two weeks taken out of 14 months and 24 days may at first seem to be an insignificant detail. However, the fact that only two weeks were taken to blow out, replace the hearth, and go back into blast is remarkable. The furnace maintenance could not be ignored. In order to make the repairs and go back into blast so quickly, materials had to have been laid out before the furnace went out of blast and labor had to have been organized. It can

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[27] Walker 57.

[28] Division of Publications, National Park Service, Hopewell Furnace: A Guide to Hopewell Furnace National Historic Site, Pennsylvania, Handbook 124 (Washington: U.S. Dept. of the Interior, 1983) 43.

[29] Hopewell Furnace Record SM21 p206a, May 1, 1837.

be seen from the ledger entries quoted above that it took almost a week to remove and replace the furnace hearth. The fillers, of course, could not begin to charge the furnace again until the hearth work was completed. After the furnace had been charged, and the charcoal ignited down by the hearth, it took about two or three more days burning until the ore began to melt and the furnace could go back into blast.[30] Working on such a tight schedule it appears that the workers waited only about two days for the furnace to cool before tearing out the worn hearth. In light of these findings, it is evident that it must have been an uncomfortably warm job, especially in August. As part of the interpretation at Hopewell Furnace it would be appropriate to have a hearth stone and a load of sand-stone building stone displayed as if it were going to be used in the furnace.

Bridge House and Blast Machinery

The Hopewell oral histories,[31] as well as Russell Apple's research, record the existence of a staircase and a blast regulator near the north face of the furnace.[32] The stairs were

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[30] Hopewell Furnace Records, Historical Accounts K-L: Long, Harker (Last manager at Hopewell Furnace) 1936.

[31] Hopewell Furnace Records, Historical Accounts K-L: Long,Harker, Verbatim Notes 1935; Historical Accounts, Painter Family: Charles Sheridan, Painter, interview by Hugins 1953; Stevenson, Charles E., interview by Gale 1940.

[32] Russel Apple, Documentation for the Historical Base Maps, Hopewell Village National Historic Site (Washington: U.S. Dept. of the Interior, National Park Service, 1956) II-123, II-124.

located near the junction of the north moulding shed and wheel house by the retaining wall, and ran up to the bridge house. The blast regulator was located in front of the tuyere arch. The staircase was removed in 1880-'81 and a platform for the steam engine was installed in its place. No contemporary documentation of the staircase has been found, and any archeological record of the stairs was obliterated by the construction of the steam engine platform. The only record of the stairs is the recollections of "old timers" who lived and worked at Hopewell. In terms of functional design, it seems likely that the staircase was there during the 1830's to facilitate movement and communication between the tunnel head, tuyere and regulator, and furnace hearth. It is unlikely that directions could be shouted up to the filler from the lower level for several reasons. First, one would have to stand near the wheel pit and shout up between the beams and joists which support the blast machinery. The east head race was approximately 30 feet from the lower floor level and struck the 22 foot waterwheel in an overshot manner, the fall of the water over the wheel would have been much louder than the west race high-breast wheel arrangement alone. Furthermore, one cannot see if anyone is in the bridgehouse from the lower level. Also, the whoosh of the gases burning off at the tunnel head during blast would make it difficult to hear. The alternative of leaving the cast house to use the office-store stairs would be equally inconvenient, especially during the winter months when the cast house would be warmed by the furnace,

but outside it could be cold and icy. With the stairs located inside the cast house, furnace operation would have been much more efficient than it would be without the stairs. While it is true that we do not have physical documentation of the stairs for the 1830's period, our current knowledge of the processes and activities involved with operating a charcoal blast furnace suggest the necessity for their existence during the period of interpretation.

It is known that the blast regulator was essential to the efficient operation of the blast furnace, and yet the only descriptions we have of the regulator at Hopewell is found in the oral histories of the post 1830's era. Charles Sheridan Painter described the regulator briefly in an interview taken by Walter Hugins as follows:

> One other point: he [Mr. Painter] mentioned a blast regulator which stood on the ground in the tuyere arch immediately in front of the tuyere. The blast pipe from the receiver ran into this wooden box and then into the furnace. A handle was set vertically into the box from the top, resembling a tire pump, which regulated the blast of air. There must have been valves in the box so that the air could be released when it was shut off from going into the furnace; otherwise, the backed up pressure would damage the blowing tubs.[33]

As I previously stated, by 1838 Clement Brooke experimented with applying the heated blast at Hopewell, which at that time was the

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[33] Hopewell Furnace Records, Historical Accounts Painter Family: Painter, Charles Sheridan (Interview by Historian Walter Hugins April 15, 1953). It should be noted that the regulator control most likely did not "shut off the furnace" per se, but probably regulated the air flow to allow the air to be restricted just enough for a constant pressure to be maintained inside the box.

newest, most advanced technology in iron manufacture. Manufacture of Iron was published in Philadelphia in 1837 by the Society for the Diffusion of Useful Knowledge. The book offered a detailed discussion of the state of the art in the industry. In addressing aspects of the blast the book states:

> It has long been thought that the disadvantage [in making iron] experienced in the summer months was to be attributed (by some unknown connexion) simply to the heat of the weather; [instead of the higher humidity in the air] and it was, therefore, supposed that a cool blast was most favorable to the smelting of iron. So mistaken does this notion now appear, that a patent has been recently obtained for heating the blast artificially before it is passed to the furnace. Care is, of course, taken that it has no opportunity of absorbing moisture with its increase of temperature; otherwise the effect would be injurious, instead of advantageous. The invention has not yet been brought into general use, and therefore no certain decision can be pronounced as to its efficacy: there seems, however, to be a strong probability of its ultimate general adoption and success.[34]

It seems very unlikely that a man who was willing to install new equipment that was still considered to be experimental would not be using a blast regulator, which at that time was considered to be standard equipment and an essential part of the blast machinery. In regard to regulating the blast pressure when the blowing piston pumped a pulsating stream of air from the blowing cylinder Manufacture in Iron states:

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[34] Society for the Diffusion of Useful Knowledge, Manufacture of Iron, reprinted from the Library of useful Knowledge (Philadelphia: Orrin Rogers, 1837) 16-17.

> If the volume of air thus generated were to be passed immediately through small pipes to the twyeres, it would produce an intermitting, irregular blast, almost dying away at the end of every stroke of the engine, and exerting its utmost force between pauses. This would be very injurious to the furnace, for which great regularity in the blast is a desideratum. To obviate this inconvenience, the air is passed from the engine into a large iron reservoir, called a regulator, from its effect in equalizing the current to the twyeres.[35]

An earlier source The Cabinet Cyclopaedia, published in 1831 deliberated upon regulators as follows:

> The apparatus for blowing varies considerably in the mechanical construction: the most common arrangement is to have a cylinder at the end of the engine beam, closed at both ends, with a piston moving throughout its length. Thus, when it is expelling the air at one end, it is receiving it at the other, and so on alternately. It is evident, however, that this would produce an irregular blast, but partially answering the purpose; to remedy the defect at some furnaces, they have another cylinder connected with the air pipes open at top, and in which works a weighted, or what is called a fly-piston, the use whereof is this:- when the first piston is reversing its motion, the fly-piston descends, but when the former is in the middle of its stroke the latter descends [sic. ascends]; and by this means the blast is regulated.
>
> Another method consists in the use of what are called water-bellows; these machines depend on the principle, that a stream of water running through a pipe, if by any means it is mixed with air at its entrance, will carry that air along with it again as soon as it comes out of the pipes; the air then being collected by a proper apparatus, it may be used with success for exciting the most violent degree of heat. Dr. Lewis has made a great many experiments on this blower; one objection to which, however, has always been the degree of humidity with which the blast has been loaded. The most approved method therefore is to compress the air into what is called a dry regulator; this is merely a large metal box about three yards square and ten or fifteen feet long, perfectly air-

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[35] Useful Knowledge, p. 15.

> tight. The elasticity which the air acquires by compression causes it to issue from this vessel in a perfectly regular blast. This mode is considered the best, from its regularity, and because the air is free from moisture.[36]

It is likely that a dry regulator could have been installed at Hopewell Furnace. Charles Sheridan Painter described the regulator as a "box", which most closely matches the description of a dry regulator. He also stated that it was located in front of the tuyere, a fly-piston regulator would logically be near the blow tubs. There is no dispute that Hopewell was equipped with a water wheel and blow tubs, therefore a water-bellows was not employed. Manufacture of Iron describes a water regulator as "a cube or cylinder, open at the bottom, and fixed in a larger vessel or cistern of water."[37] The air pressure pushed against the water and, in effect, functioned as a fly-piston does. However, the water regulator had already fallen out of favor in the 1830's because it introduced humidity into the blast. Also, Mr. Painter's brief description of the regulator at Hopewell does not even remotely fit that of a water regulator. In addition, a dry regulator as described in Cabinet Cyclopaedia would fit easily in the area below the bridgehouse. Having no blast

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[36] The Cabinet Cyclopaedia. Conducted by the Rev. Dionysius Lardner, LL.D F.R.S. L.& E. M.R.I.A. F.R.A.S. F.L.S. F.Z.S. Hon.F.C.P.S. &c. &c. Assisted by Eminent Literary and Scientific Men. Useful Arts. a Treatise on the Progressive Improvement and Present State of the Manufactures in Metal. Vol. I. Iron and Steel. (London: A.& R. Spottiswoode) 48-49.

[37] Useful Knowledge, p. 15.

regulator at all leaves a breech in the explanation of the process of iron making during the 1830's. A furnace with no regulator seems more appropriate for eighteenth century interpretation than it does for nineteenth century interpretation.

Charcoal House, Connecting Shed, Cooling Shed

The ground beneath the connecting shed and the charcoal house would have been blackened with charcoal dust from the constant carting of fuel to the tunnel-head. The archeological reports from John Cotter's digs uncovered heavy layers of charcoal dust, much of which was removed or covered during reconstruction.[38] The cooling shed especially would have had very heavy deposits of charcoal dust during the period of furnace operation as would the windows through which the charcoal was shoveled into the charcoal house. The layer of charcoal dust and charcoal crumbs that would have collected in the bottom of the charcoal wagons would have been left under the cooling shed after the load had been dumped, spread, and moved into the charcoal house.

It appears that the "mine" (iron ore) was delivered to Hopewell already broken up into small pieces. The ore pile should have the ore broken into smaller sizes than it currently

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[38] Hopewell Historian Earl Heydinger reported that the dust had been moved from the furnace bridge house area into the cedar pasture as recorded in Mr. Kurjack's monthly reports prior to 1958. Hopewell Furnace Library, Historians Research Files: Charcoal. Earl Heydinger, August, 1972.

is. Overman in A Treatise on Metallurgy states that the ore should be broken up into egg size pieces. The limestone should also be broken into small pieces.[39] It is well documented that the ore was washed at the mines. It needed to be washed to free it from sand and small particles which could "choke" the furnace, that is, reduce the air flow and interfere with proper blast. The angry tone of a letter written by Clement Brooke in 1838 regarding improperly washed mine delivered to the furnace might suggest that none of the ore was ever broken and washed at the furnace but was always done at the mines. The letter was addressed to Robert S. Potts and was written at Hopewell Furnace on August 15th, 1838. It read as follows:

> Dear Sir,
>
> This is to inform you that the two last loads mine Recceiv^{d} -was at least one half sand which makes it entirely useless and if worked with the other ore destroys the whole- it was understood at the commencement this spring that all the ore must be merchantable which I am sorry to say is not the case. The ore that we have hauled washed by the monthly hands under your immediate notice is as good as any we have ever Receiv^{d} from the Warwick mines -- the person who washed the two last loads hauled by our teams must have known that he was cheating and trying to deceive, we think it is now proper to give you this notice that unless those persons you have engaged to wash mine by the ton do not deliver ore clear of sand and every way merchantable that we will not Receive any ore from them washed after this date and will not be accountable for any part

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[39] Frederick Overman, A Treatise on Metallurgy Comprising Mining, and General and Particular Metallurgical Operations With a Description of Charcoal, Coke, and Anthracite Furnaces, Blast Machines, Forge Hammers, Rolling Mills, etc. (New York: D. Appleton & Company, 1852)496.

> of their labor, and as far as this place is interested we demand of you to discharge them. [40]

CARPENTRY SHOP

The unreconstructed structure which once stood just a few feet south of the cast house has been identified as the "wheelwright shop" on the Apple Historical Base Map and in subsequent reports. However, during the 1830's there was no wheelwright shop at Hopewell Furnace. Records for that period indicate that wheelwright work was done elsewhere. Cash payments were drawn from the furnace accounts to pay craftsmen for wheelwrighting, rather than the more typical payment by credit directed to a Hopewell employee's account. The "wheelwright shop" should more properly be called the "carpentry shop". The wheelwright pit was probably not added to the carpentry shop until after 1848.[41] The furnace did need to have the carpentry shop during the period that castings were being manufactured. Not only did the furnace need to make the flasks for the patterns, but boxes needed to be built to ship the finished castings to the customers. It was typical for the customer to

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[40] Hopewell Furnace Document 8380815a Microfilm Roll 361, August 15, 1838. Letter from Clement Brooke and Company to Mr. Robert S. Potts.

[41] Russell Apple, Documentation For The Historical Base Maps II-107. Mr. Apple notes that Thomas Roberts was the first full time wheelwright at Hopewell from 1848 to 1852. Mr. Apple also refers to wheelwright work done in 1837 (SM 19:482) however, the wheelwright in that record was paid "cash in full" and not in credit to a furnace account.

supply the patterns, but the flasks and follow boards to fit the patterns were made at Hopewell.[42] A letter sent from Clement Brooke and Co. on April 21, 1838 to Morrison and Webster stated, "Your letter of the 13th instant has been received. In answer your new cook stove pattern made by Powel Stackhouse was received here last fall -but we have made no flasks and follow boards to cast them and it will be a considerable expense to have them made- We would prefer having our last years acc^{t} with you paid up before we commence on a new contract..."[43] The furnace records show regular payments for carpentry work done by Hopewell workers throughout the period of interpretation. Hopewell Furnace did not keep its own pattern maker employed at the furnace but the carpenters at the furnace did make minor corrections, modifications and repairs, to patterns.[44] Letters written to Hopewell by customers during the 1830's provide proof that patterns were altered at the furnace. Mr. Savage wrote in

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[42] Hopewell Furnace Document 8360910, transcribed by historian Gebhard. In September of 1836 Mr. Gilbert wrote to Hopewell that he was sending patterns and that he "...will Compensate for the expense of Flasks & Fallow Boards..."

[43] Hopewell Furnace Document 8380421, Microfilm roll 361 April 21, 1838.

[44] Charles W. Warnick was one of the pattern makers who made patterns for Clement Brooke and Co. Hopewell Furnace Document 8361231A is a bill for carving patterns. Mr. Stackhouse of Philadelphia was the pattern maker for Hopewell customer Henry Fougeray, Hopewell Furnace Document 8310723. Mr. Deas of Philadelphia made patterns for Hopewell customer Morrison and Willard, Hopewell Furnace Document 8331017. There are more pattern makers whose patterns were sent to Hopewell Furnace, but it will not be necessary to list them all here; I only want to exemplify that the pattern maker did not work at the furnace.

November of 1830, "...on putting your castings together they are all too tight- I beg of you to have them put together and have all the patterns shaved off a little by y^{r} pattern maker- which will save much trouble in chipping."[45] Henry Volkmar wrote in November of 1831, "I wish you would look at my pattern per oval with the oven in front. You have altered it and the feet do not fit. I wish you would alter it back and send me some immediately..."[46] In July of 1836 Isaac Hess wrote, "Mr. Broo[ke], I want you t[o] [m]ake some alterations in the griddles of my cook stoves. They will not fit tight and leaves too much heat Escape they are too thick at the ears and want planeing off some..."[47] There are other letters which were written to Clement Brooke and Co. giving detailed instructions for minor modifications to patterns such as the placement of holes.[48] Not all the pattern alterations were done at Hopewell. One customer, Ephraim Bailey, wrote in 1836 that he wanted Hopewell "...to box up my new pattern and send it by the bearer. I want to send it to Philadelphia and have it altered and sent back to [Hopewell]

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[45] Hopewell Furnace Document 8301124, Microfilm Roll 354, Nov. 24, 1830.

[46] Hopewell Furnace Document 8311117, Microfilm Roll 355, Nov. 17, 1831.

[47] Hopewell Furnace Document 8360722, Microfilm Roll 360, July 22, 1836.

[48] Hopewell Furnace Document 8341213A, Microfilm Roll 358. This document is a Dec. 1834 letter which gives instructions for altering patterns for Jonathan Palmer in Philadelphia. Many letters of this nature, often including rough sketches, are in the Hopewell Furnace National Historic Site archives.

Furnace by Christmas..."[49] Another stove dealer who was a pattern maker wrote an interesting letter in 1836 which read as follows:

> Now I hope you wont be very angry when I say that I wont iron your pattern until I get my Box of patterns which you promised to send me. They are of as much importance to me as the other pattern is to you. If you will keep them and allow me to charge them to you, I will make new patterns in place of them.
>
> Respectfully, James H. Deas
>
> I have purchased for your carpenter the chissels for him, also a lump of red chalk but he must pack my patterns up that he promised or he don't get them till he does. [50]

It should be noted that not all patterns were made of wood. In the 1830's some patterns were also made of iron,[51] brass, and of copper. Although wood was the predominant material from which patterns were made, the following list in which Mr. Brooke Buckley paid Hopewell Furnace for patterns documents the presence of metal patterns during the period of interpretation.

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[49] Hopewell Furnace Document 8361116, Nov. 16, 1836.

[50] Hopewell Furnace Document 8360613, June 13, 1836. Transcribed by historian Earl Heydinger, January 1970.

[51] Hopewell Furnace Document 8360910, transcribed by historian Gebhard. On Sept. 10, 1836 J. T. Gilbert stated in a letter, "...have forwarded to the care of your agent Mess Bonsall & Wescoutt Two Boxes Paterns one large n° 4 Wooden Patern 4 Boiler and Iron Patern N° 2 Premium one size larger than the one you now have in wood..."

...for 34 pot flasks del'ed [delivered] to
the canal the 24th of July 1833 $120.00
'' 8 brass pot patterns 1 gal, 1 1/2, 3 1/2,
4, 5 & 7 gallons making in all
36 1/2 gallons @ $6 per gallon 159.00
'' box [shipping crate] .50
'' 4 copper oven patterns and follow boards 36.00
'' 4 tops of mahogany @ $3.50 14.00
'' 4 setts feet handles and ears 3.50
'' 5 copper skillet patterns @ $3.50 17.50
'' 5 follow boards for ditto 5.00
'' handles and feet for do. 7.75
'' box .92
NOTE All the above flasks and patterns were delv'd to the canal, Bannon's Landing the 24th of July 1833. [52]

In addition to making flasks, follow boards, and pattern repairs and alterations, the carpenter made boxes for shipping patterns, as mentioned above, and more importantly for shipping out the finished castings from the furnace. The boxes were not built to hold each casting individually, but were designed to carry several at a time. The castings in the box were probably held firmly in place and apart from each other by scantling frameworks fastened inside the crate. The same practice is used today for shipping heavy objects such as machine castings. In 1833 Mr. Cunningham wrote from New York to suggest that Clement Brooke and Company box or board the no. 5 & 6 griddles separately to reduce breakage and that the expense of doing so would be a trifle.[53] An 1837 listing of the number of stoves and pieces packed per box, and the total weight of each box, indicates that

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[52] Hopewell Furnace Record, SM21 p92b Feb. 13, 1834.

[53] Hopewell Furnace Document 8330424, Microfilm Roll 357, April 24, 1833.

the crates held just over a ton of products.[54]

The carpentry shop is situated immediately adjacent to the cast house to maximize the efficiency of movement through the process of casting stove plates, cleaning them, packing them, and shipping them. The stove plates could be cast and cleaned in the cast house, then wheeled from the cast house just a few paces to the carpentry shop were the castings could be boxed and prepared for hauling. The loaded boxes were probably kept temporarily in the carpentry shop to protect the new products from the weather until the teamsters could haul them away. The Bull photographs show that the building had double doors across from each other in the east and west walls which would have served well as a drive through for loading and unloading wagons.[55]

FENCES

The road which runs in front of the tenant houses, Warwick Road, was fenced on both sides, some of the Hopewell workers used to graze their stock along the grassy edges of the road.[56] The

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[54] Hopewell Furnace Record SM21 p204b May 1837.

[55] Hopewell Furnace Photo Archives 101.03 Bull 1890, the photograph shows the east facade of the carpentry (wheelwright) shop looking straight through the east doorway and out the west doorway. Also, Photo 125.01 Stokes 1889, shows the south end of the building and the east facade, some of the north end of the building can be seen in the Bull photograph.

[56] Hopewell Furnace Records, Historical Accounts Painter Family: Painter, Albert 1958. "The cows [were] pastured along the roads - up and down it. There was pasture available on both sides. Would go as far as 2-3 miles. One killed by the RR at Warwick. Each cow had a bell to help locate it. They didn't use the meadow because it wasn't their land. They were tenants."

archeological explorations around tenant houses one and two located several fence post holes which suggested some fence lines. The report stated that the picket fence post holes that were uncovered did not date before 1850.[57] During the 1830's, it seems, that most of the fencing put up by the company at Hopewell and around the tenant houses was post and rail. Furnace records show payments for three rail, four rail, and five rail fences. Also, there are furnace payments to workers for splitting rails.[58] Furnace records mention specifically that some fencing was made from chestnut and from cedar but most of the time fence rails were probably made from whatever hardwoods were readily available.[59] There would have been a much greater diversity of fencing in the 1830's than is depicted today. I believe that a

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[57] Garry Wheeler Stone, Archaeological Tests at Tenant House No. One And Environs (Hopewell Village National Historic Site, 1968)

[58] Hopewell Furnace Records, SM14 p91a-98a May 4,1830: "making 425 rails at old mineholes in 1829 @ .25, making 322 rails at ditto @37$^{1}/_{2}$." (The previous entry is also found in SM21 p32a Jan. 4, 1832.) SM15 p57a July 1, 1831: "for putting up 107 panels of 4 rail post fence around John Wert's new house, for putting up 71 panels 4 rail post fence around the lot where Thos Care Sr now lives, for putting up 178 panels @ 18 per panel, deduct for making 712 rails used by them in above fence @ 50 per hun." SM15 p59a July 1, 1831: "for making 191 panels of 4 rail fence where Roberts now lives @.16, ditto 18 panels 5 rail fence @.18, 14 panels 3 rail @.15, making 100 rails .50." SM21 p89b Jan. 20, 1834: "456 panels 5 rail fence."

[59] Hopewell Furnace Record SM14 p71b Nov. 23, 1829. "40 seder rails @.08 $3.20" Transcribed by historian Earl Heydinger 1969, Hopewell Furnace N.H.S. Library Historians Research Files. Hopewell Furnace Document 8220131, "Henry Sheetz farms on shares for Samuel Barde." Jan. 31, 1822. "Sheetz to keep the fences in repair & to split & put two hundred chestnut rails on the fences..." Transcribed by Hopewell Historian Motz, Hopewell Furnace N.H.S. Library Historians Research Files.

fence along the west side of the road in front of the tenant houses could be three rail in contrast to the four rail fence currently across the road which fences a pasture. The rail fences which apparently enclosed the yards of the tenant houses may well have been three rail fences. A circa 1835 sketch drawn on the back of an Hopewell Furnace document depicts a small house with a three rail fence enclosing the back yard. The house is similar to, and in fact may be a sketch of one of the smaller Hopewell tenant houses which no longer stands.[60] The furnace records show that five rail fences were also often used at Hopewell in the 1830's. The four and five rail fences would have been used for fencing in stock, particularly horses and mules. The lowest rail on five rail fences can prevent smaller animals, such as sheep or hogs, from escaping under the fence when pastured with larger stock. Three rail fences were useful for fencing animals out of an area. It is not inappropriate that tenant house three, the duplex, has the yard fenced with a picket fence. It is known from interviews and late nineteenth century photographs that all of the tenant houses had picket fences in that late period. It is quite likely, however, that the duplex, which is a much more formal house than the other tenant houses, had the more decorative picket fence surrounding it while the

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[60] It should be noted that Hopewell Furnace records indicate that four rail fences were erected around some of the houses (see footnote 58). It seems that in the case of the tenant houses in the village, which were furnace workers dwellings without any farm land, that the less expensive three rail fence would have served as the yard enclosure.

smaller tenant houses did not. Having a picket fence surrounding the house was a popular fashion in the 1830's. The archeological explorations around tenant house one dated the picket fence post holes as being post 1850, but archeological tests were not conducted at tenant house three to determine the fence chronology there. Unfortunately, the furnace records are not explicit enough to give a clear description of what precisely the village area looked like in the 1830's. Because the furnace records mention picket or pale fencing so infrequently, yet picket fences were common during the period, it is my belief that the tenant house gardens and garden fencing were the responsibility of the individual tenants, were as the general fencing around the house was provided by the furnace and maintained by the tenant. If the tenants erected their own picket fences around their gardens it would explain why picket fencing does not show strongly in the furnace bookkeeping.[61] There is a rough draft of a letter dated March 22, 1835, which is now preserved in the Hopewell Furnace National Historic Site Archives. The letter was addressed to James Roberts and it reads: "I wish you to send word by Bill- if I can depend on you to move pickets on Tuesday next, to be there

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[61] Hopewell Furnace Record SM59 p20b April 2, 1827. "Furnace Dr [debit] to Isaac Koplin... for sawing 8070 feet pales @.40 $35.12." There is also an 1817 furnace account with Michael Sands which historian Earl Heydinger transcribed in 1958. (Hopewell Furnace N.H.S. Library, Historians Research Files) Included in Michael Sands account is the notation, "for 7 days work by his son John at the garden pales 5.25." Hopewell Furnace Record SM7, July 25, 1817. It is quite possible that these pales were made for the Iron Master, as many of the Brooke family expenses appear in the furnace ledgers.

by day light- send a positive answere- intend to pay you $15.00."[62]

Stake and rider fencing was used for non-permanent locations because it could be easily taken up again and reused. One example of where stake and rider fencing was used was for the fencing of chestnut woodlots after they had been timbered. Chestnut trees send shoots up from their stumps and the trees will grow back after being cut. In order to protect the sprouts from grazing cattle the area was fenced. A local Lancaster County farmer wrote in his diary on May 16, 1832, that on that day he had been "fencing a part of our chestnut lot where the timber had been cut off."[63] The furnace records also make specific reference to this activity in the spring of 1846 and 1849 as follows: "Furnace Dr [debit] to Samuel Potsgrove [Palsgrove] for hauling rail and making fence round the cutting on Bonsall Hill as per his acct. [account] $14.25." "By Furnace paid Samuel Wells for keeping up fence around sprout area near Geigers $1.00."[64] Local folk artists, Lewis Miller and Ferdinand

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[62] Hopewell Furnace Document 8350322, March 22, 1835. There are two very similar versions of the letter written at the same date. Because the letters are only rough drafts they are anonymous and were not intended to be sent, presumably a good copy was made and then sent. The rough drafts then remained with the various furnace papers at Hopewell.

[63] Chester County Historical Society, Diaries 1831-1834 Vault. Farmer's Diary, writer unknown, giving an account of farm work and of the weather.

[64] Hopewell Furnace Records SM32 p2a May 11, 1846. Transcribed by historian Earl Heydinger, 1971, Hopewell Furnace N.H.S. Library Historians Research Files. SM31 p91b April 25, 1849.

Brader, depict stake and rider fencing being used locally as well as many other fence types.

TENANT'S GARDENS

Pale fences have been used for centuries, and it is most probable that the tenant's garden plots would have been fenced with a picket fence in spite of the fact that the archeological tests were not fortunate enough to uncover a clearly 1830's post hole which could be identified as a picket fence hole. The rail fences were used to control cattle and large animals, but picket fences were needed to protect gardens from chickens, pullets, and other fowl as well as from rabbits. The great variety of fences used locally in the nineteenth century can be examined in the works of folk artist, Lewis Miller, of York, Pennsylvania and Berks County itinerant artist, Ferdinand Brader.[65] The tenant

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[65] Lewis Miller, Sketches and Chronicles, (York Pennsylvania: York County Historical Society, 1966) Hopewell Furnace Library Collection NC1075 .M545 see also, M. Theodore Mason, Jr., and Beulah B. Fehr, Brader in Berks, 1880-1883 ed. Paula M. Flippin (Reading Pennsylvania: The Historical Society of Berks County, Inc., 1986). Lewis Miller was born in York in 1796 and lived until 1882, sketching scenes throughout most of the nineteenth century. Ferdinand Brader sketched in Berks County from 1880 to 1883. Both of these artists works provide a tremendous resource for studying period fencing and also can be compared to each other to determine the length of time a particular fence type stayed in use. For example, if Mr. Lewis depicts a particular fence type in use before 1830 and Mr. Brader depicts that same fence type in the 1880's, then one can be fairly certain that the type was in use during the 1830's. These two local sources provide good visual documentation for reproducing period fencing at Hopewell Furnace National Historic Site.

house gardens were located by surface archeology. At tenant house one a deposit of stones which had been pulled out of the garden and tossed along its perimeter was archaeologically excavated at one edge. It was suggested in the archeological report that "If the extant plots are to be gardened again, it is recommended that field stones removed from the garden be casually heaped along the east and west sides of the gardens."[66] No specific mention was given in regard to the garden's lay out. It was quite typical for vegetable gardens in Berks county to be laid out in the old tradition of four raised beds, that is, four rectangular or square raised beds divided by two narrow, dug out pathways which cross 90 degrees to each other at the center of the garden. The soil in the raised beds would often be retained by rough cut inexpensive lumber or even slab wood. Slab wood is the rough, bark covered outer wood which is a by product from sawing logs into planks. If slab wood were used the bark side of the slab would be faced into the garden bed to retain the soil. Short stakes would be driven on both sides of the boards to hold them in place. The boards should not be nailed to the stakes because otherwise they can not be pulled up to spade and turn over the soil and to prepare the garden beds in spring. Of course the layout of the tenant house gardens would vary in accordance to the personal preferences of the individual who lived there. Many of the tenant gardens were probably simple rectangular plots that could be easily plowed without any special

[66] Stone, p. 17.

preparation. The records show that cabbages, potatoes, sweet potatoes, turnips, beets, and pickles (cucumbers) were purchased by the Furnace.[67] Some of the vegetables were obtained from Hopewell employees who no doubt grew the produce in their own gardens. The Furnace kept records for farm leases. The leases indicate that in addition to grains and hay crops the farmers planted one quarter to one half acre with potatoes and one quarter to one half acre with flax.[68] Because the tenant house gardens were the workers own responsibility the Furnace kept few records of them. Therefore, it is necessary to look at sources other than the Furnace records to determine what the tenants may have grown in their gardens. Fortunately, a contemporary local seed merchant published a list of popular garden seeds which he

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[67] Hopewell Furnace Records SM21 p50b Jan. 16, 1833, "Sundries Dr. to... Thomas Care for boarding hands while making rails on Potts Hill & 2 1/2 Bu. potatoes." SM25 p264a April 7, 1835, Eve Hubly received payment for potatoes, turnips, chestnuts, pickles, and cabbage; from notes taken by Earl Heydinger. SM21 p2b 1831, Thomas Care bought $3.90 worth of cabbage, turnips, and beats from John Hubly and the Furnace also "bought turnips etc. for $2.44" transcription by Earl Heydinger,'66.

[68] Hopewell Furnace Documents: 8290112 Jan. 12, 1829, Isaac Hoyer leases farm from Clement Brooke, "Hoyer to have 1/2 acre for potatoes, 1/2 acre for flax,..." transcribed by Charlotte Fairbairn, '63. Document 8350102 Jan. 2, 1835, Isaac Hambleton leases part of a farm from Henry Care, "Henry Care doth lease or let unto said Isaac Hambleton... half the garden and ground sufficient to plant six bushel of potatoes..." transcription by Rochowicz. Document 8361222 Dec. 22, 1836, Henry Close leases farm from Clement Brooke, "...[said Close] is also to have ground for potatoes and flax for his own use..." transcription by Motz. An interesting notation is found at the bottom of an 1820 farm lease which reads "...Flax ground 1/4 acre - $2.00 Potatoes 1/4 [acre] -Say 40 bus[hels] @12 1/2 - $5.00 ..." document 8201209 Dec. 9, 1820, Abraham Funk farms for Matthew Brooke on shares, transcription by Motz.

offered for sale. I have transcribed his March 13, 1838 seed list below.

GARDEN SEEDS, Warranted Fresh and Good,
for sale by John Grace.

Asparagus	Okra
Beets, early turnip	Onions, white
long red	yellow
Scarcity	Parsley
Mangelwurtzel	Parsnip, large guernsy
white sil sugar peas, early frame	
Brocoli, early white	extra early
purple cape	marrow fat
Beans, early valentine	blue Prussian
early China	blue imperial
early yellow	Prussian dwarf
Green Windsor	Knights deformity
long pods	
Scarlet runners	sugar (eatable pods)
Large white kidney	
Cabbage, early York	Spanish dwarf
sugar loaf	Pepper, bell & Cayenne
voinkeck	pumpkin
drumhead	Raddish, long scarlet
red pickling	white turnip
Green curled savoy	yellow summer
Carrots	black Spanish
Cauliflowers	Rhubarb
Celery	Spinach
Cucumbers, early frame	squash, long green
long green	early bush
white spine	Salsify, or vegetable oyster
Endive	
Fennel	Tomato, large red and yellow
Leek	
Mellon, green citron	Turnip, white Dutch
Melongena,	white stone
or egg plant	red round
Mustard, white	yellow Swedish,
brown	or ruta baga
Nasturtium	Herbs of several kinds

50+j March 6

N.B. Dealers in seeds, and country merchants supplied at wholesale prices, on the best of terms. Seeds packed in boxes for the country, made in small

packages, with the retail prices marked on.[69]

OUTHOUSES

The outhouses at the tenant houses would have been simple structures unlike the more elaborate and decorative privy at the iron master's mansion. Due to regrading done by the C.C.C. behind the tenant houses it is difficult to locate historic privy sites. The later nineteenth century privies behind tenant houses one, two, and three (the duplex) can be located in the Bull and Stokes photographs.[70] Because common pit privies were periodically moved as they became filled, it is unlikely that the outhouses in the photographs are situated as they were in the 1830's. In spite of that, the photographs are useful interpretive tools. One can see in the photos where residents at one time did locate a working privy. Also, it is conceivable that an outhouse could remain close to its 1830's location. The outhouse would be pulled off the older privy holes once they had reached their capacity. The old hole would then be filled and smoothed over and the outhouse placed over a new hole. It is quite possible that the new privy would be dug fairly close to the old location. Soil dug from the new pit could be used to

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[69] The Village Record XXI.1075 (1838). Located at the Chester County Historical Society, West Chester. The order and the lay out of the plant names has also been duplicated from the newspaper's list.

[70] For a detailed analysis of the historic photographs of the tenant houses see "Photograph Correlation Tenant House Area" in Garry Wheeler Stone, Archaeologist, "Archaeological Tests at Tenant House No. 1 and Environs, Supplement, Historic Photographs of Tenant House Area," 1970, 3-4.

cover the old one and the outhouse itself could be dragged into position over the new pit without having to cart it very far. The fact that a grape arbor stood directly behind or west of tenant house two suggests that a privy, at one time, may have been located behind the house. Grape arbors were sometimes located near outhouses to screen them from the house.[71] When the outhouse itself became worn out the replacement would most likely vary little in design from the earlier structure. The outhouses at the tenant houses were built in a traditional, very functional design and incorporated little or no details of contemporary design motifs or styles as the privy at the Big House did. One can see in the late nineteenth century photographs that, even then, the outhouses were built with a conventional design that could have easily been found in the 1830's. It should be noted here that Mr. Walker reported in Hopewell Village: A Social and Economic History of an Iron-Making Community that "Close by the office-store was a privy used by the workers in and near the Furnace."[72] Further research indicates that the foundation near the office-store to which Mr. Walker was referring was not a privy. Mr. Walker cites historian Earl Heydinger[73] who, in turn,

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[71] Amos Long, Jr. The Pennsylvania German Family Farm (Breinigsville, Pennsylvania: The Pennsylvania German Society, 1972) 239. The chapter on the outdoor privy pages 229-243 is a very good reference.

[72] Joseph E. Walker, Hopewell Village: A Social and Economic History of an Iron-Making Community (1966; Philadelphia: University of Pennsylvania Press, 1967) 301.

[73] Earl J. Heydinger, "Orientation Report for Archeology in Lower Working Level at Hopewell Village NHS" (unpublished report,

probably based his information on Russell Apple's Documentation for the Historical Base Maps[74] who referred to one of Paul Schumacher's 1955 archaeological reports. Schumacher had stated "...that walls DD, EE,and FF form a small square stone structure with walls GG which we uncovered - this structure so far has never been mentioned by any old timers and is not seen on any drawings or photographs - but it may well have been a privy for the furnace - office area community."[75] The site was re-excavated in 1963 because the first dig had been inconclusive. It was found that the structure was not a privy and that it had no pit. The structure rested on burned moulding sand, dark soil, and some slag; the same fill that covered the surrounding area. A re-checking of the artifacts uncovered during the first dig found mostly scrap iron and broken roof tiles. Leland Abel pointed out in an undated report that the artifacts do not suggest privy debris and that the lack of coal or coal dust rule out its use as a coal shed. Mr. Abel does not rule out the possibility of a wood shed, and he suggests that it was possibly related to slaughtering, which was reported to have been done south of the office-store. He suggests that it may have been "a

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1962). Hopewell Furnace Library.

[74] Russell A. Apple Documentation for the Historical Base Maps, Hopewell Village National Historic Site (Washington: U.S. Dept. of the Interior, National Park Service 1956) II-78.

[75] Paul J. F. Schumacher, Archeological Field Notes: Historic Road Project Archeology (unpublished report, 1955) 7.

cool place to hang meat in the winter."[76] Currently it seems clear that there is insufficient historical and archeological data to positively identify what exactly the structure may have been.

CROPS

My compilation of references indicates that these are the grain crops which were grown at Hopewell: Corn,[77] wheat,[78] rye,[79]

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[76] Leland Abel "Privy discussion." Hopewell Furnace NHS library, Historic Structures file. In this undated report Mr. Abel analyzes the misinterpreted office-store privy and supplies evidence as to why the structure could not have been a privy.

[77] Prior to 1820 corn is referred to as Indian corn in the records, this may have been done to avoid confusion with the Pennsylvania German "korn" which means "grain" and implies wheat. It is also true that "Indian corn" referred to dark kernel corn much like we think of today. CORN: Hopewell Furnace Records, SM10 p8b May 30, 1818 (copied by Heydinger '71); SM10 p33b May 13, 1818 (copied by Heydinger '71); SM6 p108 Nov. 4, 1819 (copied by Heydinger). Hopewell Furnace Document, 8220131 Jan. 31, 1822 (copied by Motz). Hopewell Furnace Record, SM12 p19b Jan. 31, 1825. Hopewell Furnace Document, 8300329a March 29, 1830 (copied by Fairbairn '63). Hopewell Furnace Records, SM21 p57 March 1, 1833; SM28 p125b Aug. 23, 1841 (copied by Heydinger '71); SM28 p125b April 27, 1844 (copied by Heydinger '63); SM28 p139b Nov. 18, 1844 (copied by Heydinger '70); SM28 p153b April 1845; SM28 p164b Oct. 27, 1845 (copied by Heydinger '63); SM32 p34a Jan.? 1848 (copied by Heydinger '64); SM32 p38a Feb. 2, 1848.

[78] WHEAT: Hopewell Furnace Record, SM8 p160b March 4, 1818 (copied by Heydinger '69). Hopewell Furnace Documents 8200307a March 7, 1820 (copied by Heydinger '64); 8220131 Jan. 31, 1822 (copied by Motz); 8290112 Jan. 12, 1829; and 8300329a March 29, 1830 (copied by Fairbairn '63). Hopewell Furnace Records, SM31 p12b May 11, 1846 (copied by Heydinger '74); SM32 p38a Feb. 2, 1848.

[79] RYE: Hopewell Furnace Documents, 8220131 Jan. 31, 1822 (copied by Motz); 8250523a May 23,1825; and 8300329a March 29, 1830 (copied by Fairbairn '63). Hopewell Furnace Records, SM21

buckwheat,[80] oats,[81] and barley.[82] Interestingly, wheat is seldom specifically written into the records of purchases during the 1830's. Perhaps because Hopewell did not purchase much wheat, but instead, saved seed grain from the previous year's harvest. Also, the records often merely refer to "grain", "winter grain" and "summer grain," presumably unspecified grain referred to wheat, which was so commonly grown in Pennsylvania during the period that the record keeper assumed "grain" would be understood to mean wheat. By the 1820's less barley was being planted at Hopewell. During the 1830's the written record specifically documents that grain (wheat), corn, rye, and buckwheat were grown. Certainly some oats were also grown during the 1830's,

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p45b Dec. 19, 1832 (copied by Heydinger '65); SM28 p59b Nov. 1, 1841 (copied by Heydinger '70); SM31 p3b Jan. 12, 1846 (copied by Heydinger '70); SM32 p38a Feb. 2, 1848; SM32 p39b March 27, 1848 (copied by Heydinger '64); and SM31 p113 Nov. 7, 1850.

[80] BUCKWHEAT: Hopewell Furnace Record, SM10 p58b June 17, 1820 (copied by Heydinger '71). Hopewell Furnace Documents, 8220131 Jan. 31, 1822 (copied by Motz); and 8330513 May 13, 1833 (Microfilm Roll No.357). Hopewell Furnace Record, SM21 p147a Aug. 7, 1835 (copied by Heydinger '62).

[81] OATS: Hopewell Furnace Document, 8220131 Jan. 31, 1822 (copied by Motz). Hopewell Furnace Records, SM12 p7a Jan. 1, 1825; SM28 p55b Aug. 23, 1841 (copied by Heydinger '71); SM28 p131b Aug. 19, 1844 (copied by Heydinger '70); SM28 p140b Nov. 28, 1844; SM28 p153b April 1845; SM31 p3b Jan. 12, 1846 (copied by Heydinger '74); SM31 p7b March 26, 1846 (copied by Heydinger '74); SM31 p55b March 24, 1848 (copied by Heydinger '74); SM31 p56b March 30, 1848 (copied by Heydinger '74); SM31 p62b June 31, 1848 (copied by Heydinger '74); SM31 p83b Feb. 27, 1849 (copied by Heydinger '74); SM31 p87b March 27, 1849 (copied by Heydinger '70); SM31 p113b Feb. 2, 1850 (copied by Heydinger '74); SM31 p113b Feb. 14, 1850 (copied by Heydinger '70).

[82] BARLEY: Hopewell Furnace Record, SM10 p57b May 18, 1819 (copied by Heydinger '71).

the fact that no 1830's documentation has been found for planting oats is probably coincidental; there are too few records of crops to assume that lack of documentation indicates a particular crop was not grown, oats were recorded in an 1841 document.[83] The furnace records do suggest, however, that beginning in the 1840's more oats were being planted than in previous years. These grain crops, of course, also provided Hopewell with straw. Not surprisingly, the furnace records generally do not make distinctions between the different types of straw, with the exception of one 1847 entry when Hopewell Furnace paid $13.20 for a ton of rye straw.[84]

The only variety of hay specifically mentioned in the Furnace records is timothy hay. Timothy seed was first written into the records in 1817.[85] It appears in the records twice in 1833 and again in 1835 and in 1840.[86] Clover was also grown

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[83] Hopewell Furnace Record SM28 p55b Aug. 23, 1841. Transcribed by historian Earl Heydinger, '71.

[84] Hopewell Furnace Record SM31 p42b Oct. 1847, transcribed by Hopewell Historian Earl Heydinger, 1974.

[85] Hopewell Furnace Record SM8 p79b 1817. The Furnace sold $2.71 worth of timothy seed to Thomas Kerby. Transcription made by Earl Heydinger, '67. The fact that the Furnace sold seed suggests that timothy was being grown at Hopewell prior to 1817.

[86] Hopewell Furnace Documents 8330513, May 13, 1833. Microfilm Roll 357. "Clement Brooke & Co. $^{a}/_{c}$ [account] with Buckley Brooke Guards Dr. [excerpts from longer list]...to 3 bushels clover seed- $16.12^{1}/_{2}$ ...to 1 bushel timothy se[ed]- 4.50" Document 8330918a Sept. 18, 1833 letter from John L. Hadden and Company, Wilmington, to Clement Brooke, Hopewell Furnace. "Gents I enquired at all the stores in Will- [Wilmington] for fresh timothy seed but could find none. They all inform me that their [sic.] would [be] none in the market all next month but their [sic] is plenty of the old at $3.50 but I

regularly as part of the crop rotation system which was practiced on Hopewell Furnace's farms. Typically farm leases at Hopewell outline what percentage of the lime, plaster of Paris, and clover seed each party was responsible for.[87] Naturally, the clover fields were also hayed.

LIVESTOCK

Furnace records indicate that most of the draft animals used by Clement Brooke and Company were horses, although mule teams

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think you had better wait for the new as they will not Recommend the old- In hast yours &c [signed] John L. Hadden [P.S.] Please do not send any more cook stoves till ordered if you should send a load to Mr. Savval please put the front which you have not sent and the old Door for the N°. 3 cook in the load you send him." Transcribed from document on microfilm roll 357. Document 8350713a July 13, 1835 Abraham Dehaven grants property to Henry Care in East Nantmeal Township Chester County. "Abraham desires the crops of corn, potatoes, buckwheat and second crop clover in ground... Henry Care gets all the hay and straw except the stack of timothy." Transcribed from microfilm roll 359. Hopewell Furnace Record SM38 p71 Feb. 29, 1840. "Henry Houck by Timothy seed- $4.50."

[87] Hopewell Furnace Documents 8290112 Jan. 12,1829, Article of Agreement between Clement Brooke and Isaac Hoyer to lease dam tract in Robison Township, Berks County. "...[Hoyer] to haul six hundred bushel lime from the lime kiln now in the tenure of John Klauser & to spread it in a farmer like manner & likewise to find all the clover seed that may be wanted- said Brooke is to pay for the lime & be at the expense of the one half of the seed grain." Document 8361222 Dec. 22, 1836 Article of Agreement between Clement Brooke and Henry Close to lease a farm in Robison Township. "...said Close is to put on said farm one thousand bushels of lime in a proper and farmer like manner each and every year during said lease at his own expense the said Brooke is to pay for the lime at the kiln,...after the fields have taken their course of crops the said Close is to sow them with clover seed and sow on said farm each year two tons Plaster Paris,..." transcribed by Motz.

would have been a common sight in the 1830's. The Furnace was using mule teams at a later date, in past interviews Hopewell residents and workers recalled seeing mule teams in the 1860's. An inventory taken in 1820 indicated that at that time the furnace had 13 horses and 12 sets of horse gear (harnesses).[88] A table compiled by the Berks and Schuylkill Journal of production from Berks County furnaces from 1828-30 indicates that Hopewell Furnace owned 84 horses, however, not all of the horses were kept at the furnace.[89] The Union Township, Berks County Tax Records for 1837, indicate that Clement Brooke and Company had 12 horses and 6 cows. The 1841 Berks County assessment lists 14 horses and 6 cows. From these documents one can get an idea of how many head were kept at Hopewell. The other animals would be kept at the mines and at the company farms, some of which were located across the county line in Chester County. Oxen were also used at Hopewell, although they certainly would have been far less common than other draft animals. The furnace records documented Henry Painter's purchase of one yoke of oxen for the furnace in 1830 from Frederick Landis for the sum of $52.50.[90] Although oxen are much slower than horses, they can pull extremely heavy loads. Oxen are still used today in New England for selective timbering

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[88] Hopewell Furnace Document 8200307A, March 7,1820.

[89] Morton L. Montgomery, History of Berks County in Pennsylvania (Philadelphia: Everts, Peck and Richards, 1886) 98. Of the 11 furnaces listed Hopewell had the third highest number of horses.

[90] Hopewell Furnace Record SM14 p86a, Feb. 1, 1830.

in wood land that is inaccessible to vehicular traffic. It is quite likely that the oxen in the 1830's at Hopewell were being used to skid logs in steep and rocky wood lots on furnace land. The mine wagons were typically pulled by four horse teams.[91] Riding horses were not plentiful at Hopewell, the majority of horses were draft horses. Most furnace employees did not own horses. Riding and carriage horses belonged to the Iron Master's family and to their guests. The Company Clerk also owned a riding horse as did the Founder.[92] One should keep in mind that the Ironmaster, Clerk, and the Founder were the top management of the furnace, and also, the best paid. The common worker did not travel great distances on a weekly basis nor did they have the funds to afford the expense of purchasing and maintaining a horse

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[91] Hopewell Furnace Document 8340122 transcribed by Hopewell historian Rochowicz. An Article of Agreement between Thomas Lloyd and Clement Brooke January 22, 1834 to sell the iron ore rights on Lloyd's plantation in Eastnantmeal Township, Chester County. "[Clement Brooke and Co.] shall and will well and truly pay or cause to be paid unto the said Thomas Lloyd his heirs executors administrators or assigns the sum of Fifty Cents per load for each and every four horse wagon load that the said Clement Brooke... may take away from said ore bank."

[92] Hopewell Furnace Record SM21 p172b March 31, 1836. "John Benson [clerk] Dr. to Furnace for a bay wriden [sic.] horse- $40.00." He became manager at Oak Grove Furnace in Perry County (Walker, p282). Hopewell Furnace Record SM21 p189b Jan. 17, 1837. Transcribed by Hopewell Historian Earl Heydinger, 1971. "Thomas Care [founder and moulder] Dr. to Furnace for a horse bought last spring- $15.00." John Care, a moulder, had a wagon horse. SM21 p198a January 1837; "Sundries dr to John Care... Furnace for 2 wagons road and mine body- $120.00 for gray horse- $75.00 for 1 pair hames- $1.00 [total] $196.00" The Care family was fairly wealthy, the 1837 Union Township tax records list Henry Care as a Founder with 20 acres and 2 cows, Thomas Care as a Moulder with 107 acres, 1 horse and 4 cows and John Care as a non-resident with 28 acres.

for riding, and certainly they would not have owned a carriage. When a worker purchased any livestock it was practical. Many workers owned milk cows or hogs. Milk cows belonged to workers with families living at Hopewell.[93] Women would be responsible for the care of the livestock at home while their husbands worked for the Furnace.[94] It was unusual for a worker to own more than one cow, although farmers who worked the company farms on lease had more livestock. Sometimes part of the lease agreement would be that the farmer must supply the Furnace with a specific number of pounds of butter.[95] It should also be noted that tenant

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[93] Hopewell Furnace Record SM14 p67a August 18, 1829; "Beakley bought cow" Earl Heydinger transcription, 1965. Hopewell Furnace Document 8291030; "Hopewell October 30, 1829. Mr. Jacob Filman Sir, the cow Frederich Meyers purchased from you for sixteen dollars and fifty cents we will see you paid for. Yours etc, Buckley and Brooke" transcription by Gebhard. The worker's credit at Hopewell Furnace needed to be transferred to cash to pay Mr. Filman. Hopewell Furnace Document 8310502 May 2, 1831; "Moses Morten [black] bought cow $15.00" Earl Heydinger transcription,1965. Hopewell Furnace Record SM21 p112b October 18, 1834; "Wilkinson Hill [also an African American] Dr. to Thomas Kerby for a cow- $9.00. Furnace buys a milch (sic) cow from Alex Church- $18.00. Daniel Fry Dr. to Wilkinson Hill for amount per a cow bought of him as per his verbal order- $8.00"

[94] It is interesting to note that there are relatively few instances when women are specifically written into the ledger books. Butter purchases are one of these instances. Eve Hulby sells butter to the Company Store, Hopewell Furnace Records: SM25 p263b May-Sept. and p264a, April 7, 1835. SM28 p59b Oct. 30, 1841; "By Furnace paid Samuel Kumes wife for butter- $1.00." Also of interest is Hopewell Furnace Document 8380802 Microfilm Roll 361, which I have transcribed. "Hopewell July 28, 1838 Mr. William Hopper- This is to inform you that if Lidia Kephart should bye [sic.] a cow at your sale I will see you paid for her. Clement Brooke [flip side of document as follows] Received Aug. 2, 1838 of Clement Brooke & Co Twenty-seven dollars and Fifty cents in full for a cow. -William Hopper /$27.50"

[95] Hopewell Furnace Document 8201209 Dec. 9, 1820. Abraham Funck farms for Brooke on Shares. "...Brooke agrees to put 3 or 4

houses at the furnace did not have pasture land and that one had to pay for pasturing an animal,[96] some workers allowed their cows to roam freely to graze along the edges of the road at no cost.[97] Hogs were practical because they did not require so much space. The pigs could be raised on tenant house lots and be fed garbage and waste from the tenant's garden to reduce the amount of feed necessary to fatten them. Workers then sold fattened swine to the furnace come late fall and winter slaughter times.[98] The

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milch cows on the farm for Abraham's use which are to go in pasture after the 20th of May in such fields as Brooke shall direct that is reasonable pasture & to find a reasonable quantity of hay to keep them through winter to be fed with care that no hay is waisted - Brooke to have for the use of said cows 20 lbs butter for each & half the veal when 4 or 5 weeks old - of each calf..."

[96] Hopewell Furnace Record SM15 p64b August 18, 1831; "Moses Morton Dr. to Saml Lloyd for pasturing a cow 7 weeks at .18/week- $1.26" transcribed by R.(Rochowicz or Ronsheim?) 1964. The Lloyds owned a farm in Eastnantmeal Township, Chester County.

[97] Hopewell Furnace Records, Historical Accounts Painter Family: Painter, Albert 1958. See footnote number 1 (fences).

[98] Hopewell Furnace Records: SM20 p12b Dec. 13, 1831; "George North for 2 hogs 298# @ 5 cents- $14.90." SM20 p13a Dec. 14, 1831; "David Wynn for 2 hogs 315# @ 5 cents- $15.75." SM20 p14a; "Elizabeth Merwine 1 hog 113# @ 5 cents- $6.25." SM20 p16b Dec. 22, 1831; "Isaac Hughs for 1 hog wt 214# @ 5 cents- $10.70. David Hughs for 1 hog wt 214# @ 5 cents- $10.71." SM20 p179b Dec. 8, 1832; "Henry Painter for 2 Hogs 349# @ $4^1/_2$ cents- $15.70^1/_2$." SM20 p180b Dec. 10, 1832; "John Care 1 hog 303# @ $4^1/_2$ cents- $13.63^1/_2$ George North 1 hog #268 @ $4^1/_2$ cents- $12.00." SM20 p181a Dec. 11, 1832; "Micajah Posey for 2 hogs 492# @ $4^1/_2$ cents- $23.08^1/_2$ Isaac Hughes 1 hog 230# @ $4^1/_2$ cents- $10.35" SM20 p190a Dec. 28, 1832; "Samuel Williams for 2 hogs 492# @ $4^1/_2$ cents- $22.14 David Wynn 1 hog 315# @ $4^1/_2$ cents- $14.17^1/_2$ John Painter 2 hogs 499# @ $4^1/_2$ cents- $22.35^1/_2$ George Kephart 1 hog 306# @ $4^1/_2$ cents- $13.77 David Shaffer 1 hog 210# @ $4^1/_2$ cents- $9.45." This pattern of hog sales continues throughout the 1830's.

workers who owned swine did not keep more than two.[99] Tenants also owned poultry, which were so common and unremarkable that little mention is found in furnace records.[100] The furnace did, on a few occasions, buy poultry or eggs from workers but most of these records were post 1830's. Perhaps, during the later period, the number of home raised fowl was reduced necessitating the store to carry more eggs and poultry. It seems that foul roamed freely choosing their own nesting places, a fact to be kept in mind when recreating the landscape.[101]

I have already pointed out that the furnace purchased hogs for meat, but the Furnace also purchased large numbers of cattle. In September of 1831 Hopewell Furnace purchased twenty-two head,

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[99] If one examines the records showing Furnace purchases of hogs from workers, one finds that no more than two swine are sold by any individual worker. Also, in an 1821 agreement between John Green (blacksmith) and Matthew Brooke to rent a house and smith shop, Mr. Brooke specifies in the contract "[Mr. Green] is not to keep more than 2 hogs that runs at large..." Hopewell Furnace Document 8210220, transcribed by historian Mr. Motz.

[100] Hopewell Furnace Records: SM20 p60 April 6, 1832. Goose and Duck eggs were sold, transcribed by Hopewell historian Earl Heydinger, 1962. December 24, 1836 (no book or page number given); "Benjamin Hill 1 turkey- .50 Samuel Houseman 1 goose- .40." transcribed by Earl Heydinger 1971, Hopewell Historians Research Files drawer 8, poultry.

[101] Hopewell Furnace Records: SM28 p18b June 10, 1840; "By Furnace paid Peggy Hart for turkeys- $5.75" transcription by Heydinger 1974. SM32 p64a March 31, 1849; "John Church Dr. to Furnace for 7 pairs chickens got when moving away @ .28/pair, $1.96" transcription by Heydinger 1964. SM32 p143a March 31, 1853; "Sundries Dr. to Furnace... Richard and Clemens for geese- $9.68" transcription by Heydinger 1964. SM35 (marginal note) May 3, 1858; "Set a turkey Monday the 3rd, spring house. Set 2 hens with duck [eggs] under hog house. Eggs Tuesday 4th in carage [sic. house]." This last record indicates that fowl were roaming freely and had chosen their own nesting places.

Sixteen steer and five heifers for $259.00.[102] In 1839 Clement Brooke and Company paid for ten head of steer for $295.00.[103] Sheep were also bought and sold for meat. Charles Brooke at Hibernia Forge bought twenty head of store sheep from Hopewell Furnace in 1834.[104] Among the seasonal changes, one would have seen at Hopewell in autumn, was an increase in the number of livestock as steer, store sheep, and hogs were brought to the village prior to slaughter time. During the summer months mostly draft animals would be at the Furnace. The majority of animals intended for meat would be scattered among the various farms

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[102] Hopewell Furnace Document 8310929 Sept. 29, 1831. Transcribed by Hopewell historian Charlotte Fairbairn, 1963.

[103] Hopewell Furnace Document 8391203 Dec. 3, 1839.

[104] Hopewell Furnace Record SM21 p104a May 1, 1834; "Charles Brooke [sr.] Dr. to Furnace for 20 head store sheep sold him some time ago- 2.97^{1}/_{2}$ per 100- $47.50 [sic.]." Hopewell Furnace received meat from Hibernia in exchange for gate metal. Hopewell Furnace Document 8331212b, "Sent from Hibernia Forge December 12th 1833 by William Hall Eleven Hundred & Ninety two lbs pork to be delivered to Clement Brooke on acct of Charles Brooke per J Wilson. We took off 2 per cwt for green rot." transcribed by Charlotte Fairbairn. Hopewell Furnace Document 8341108a Microfilm Roll 358, "Sent from Hibernia 306 lb Green weight 302 lb beef for C. Brooke and Co. Hopewell Furnace on $^{a}/_{c}$ Chas Brooke. You will please load the team with gate metal, also send the cilenders [sic.] ordered a few days ago they are wanted. I can send H [opewell] a side or whole beef next Fryday [sic.], please let me know by return team. Chas Brooke bill of beef November 8th 1834." Also Hopewell Furnace Document 8341215a Microfilm Roll 358, "Sent from Hibernia [Forg]e December 15th 1834 by Forge team three hundred & 12 lbs pork to be delivered to Clemant [sic.] Brooke & Co. at Mr. Philman's Store (mine hole) @ 4.62^{1}/_{2}$ per cut- $14.43 Mr. Clemant [sic.] Brooke, Sir I have engaged some more pork, say 14 or 15 cut which he will send over tomorrow. As I have promised the cash and not got it in hand it would oblige if you would send it over- yours etc. Jno Wilson. NB I will look further to se [sic.] if any more can be got, the second lot @ $4.75 J.W."

surrounding the Furnace. Inventories and tax records suggest that, typically, Mr. Brooke kept 12 to 14 horses, 6 to 11 cows and 5 to 10 swine at Hopewell.[105] In addition to these animals there was the workers livestock. While sheep and sheepshearing are listed in the furnace record books, the fact that sheep do not appear in the tax records and inventories of Hopewell Furnace implies that the sheep may have been kept elsewhere at most times. Clement Brooke and Company's sheep may have been kept on the company farms. Oddly, the farm lease contracts have no mention of sheep either. It should be noted that too few inventories and tax record statistics are available at the time of this writing to make a conclusive study of animal populations and distribution at Hopewell Furnace. It seems, however, that pasture land close to the furnace would be reserved for the draft animals needed for furnace operation and for the milk cows needed for the Big House kitchen and village. The Company Store did not sell milk, but it did sell a large volume of cheese. Only after enough good pasture for 12 to 14 company horses and about 6 milk cows was assured could additional livestock be added to the village area. Hogs were kept at the village and are recorded in

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[105] Heydinger notes 1961, Union Township Tax Records, Berks County Court House: Brooke, Clement and Co. 1841 lists 14 horses and 6 cows. Ronsheim notes 1958, Union Township Tax Records, Berks County Court House: Brooke, Clement and Co. 1837 lists 12 horses and 6 cows. Hopewell Furnace Documents 8200307a, 8200307b March 7, 1820. Memorandum of stock on hand at Hopewell lists 13 horses, 11 "milch" cows, and 5 hogs. Hopewell Furnace Document 8000320, transcribed by Charlotte Fairbairn 1962, an inventory taken at Hopewell Furnace March 20, 1800 lists 10 horses, 6 cows and 2 heifers, and 10 hogs, 3 small and 7 middling.

the inventories and tax records, but they do not need pasture like sheep do. The sheep were probably not put out on prime pasture land but instead given rocky pastures and pasture land out at the perimeter of the village.

BIG HOUSE GROUNDS

The Furnace records offer a great deal of information regarding the business transactions at Hopewell Furnace, as well as the housing, the activities, and the purchases made by the workers and their families. Unfortunately, the Furnace records provide comparatively little information about the personal expenses of the Iron Master and his family. The Brooke's personal expenses were apparently recorded separately from the Furnace records and are not available for historical analysis. However, the period of interpretation for the Big House and its grounds runs up into the 1870's. This period of interpretation places the Iron Master's house and grounds within the living memory of the elderly former residents of Hopewell who were interviewed in the mid 1930's and the early 1940's. While it is true that oral histories can introduce an element of conjecture, comparison of information given by different informants during separate interviews can reveal common knowledge related by several informants. Through this method one can gain a reasonably accurate picture of the historic scene during the 1870's. Hopewell historians have already done extensive work to

compile information from the interviews. An attempt to re-compile all of the data from the oral histories at this point would be redundant. Furthermore, some of the interviews were never clearly transcribed and remain in a highly abbreviated and idiosyncratic form today. A more reliable source of information based on the oral histories regarding the Big House grounds is provided by Russel Apple's 1956 Documentation for the Historical Base Maps because most of the historians who conducted the interviews, were still active at that time and, presumably, were more able to interpret the notes accurately than one could today. It should be noted, however, that caution should be exercised if using the Historical Base Maps for anything other than the Big House because much of the documentation was based on the oral histories. The 1830 period of interpretation for the core village is well beyond the memory of the informants and therefore much of the data is highly conjectural. Excerpts from Russel Apple's documentation of the Big House grounds, which have been compiled from the oral histories, will be inserted into this report, but because further research and archeological digs have been conducted since the time of Apple's research his speculation on size and location of most of the structures is no longer pertinent and will be ignored. Further detail has been added to this report taken from the well written transcriptions of interviews that can be interpreted accurately today. Of course the oral histories are not the only source of documentation consulted for the Big House grounds; the Hopewell Furnace

records, letters, period publications, and archeological reports have been used in addition to other sources.

In addition to the oral histories there is evidence from surviving letters that the Brooke family was interested in ornamental gardens. For example, in April of 1833 Sarah Brooke wrote to Edward Brooke that their grandmother "...caught a cold when you were at home, from standing by you while you were planting some flowers."[106] Also in June of 1833 Elizabeth and Sarah Brooke visited Bartram's Garden in Philadelphia.[107] That same month Ann Brooke wrote to George Brooke, "Your gardens I suppose look very pretty- now is the season for roses and many other beautiful flowers...," incidentally, she also mentions that she kept a geranium in a pot in her window.[108] In June of 1835 Sarah Brooke wrote to Edward Brooke that she had visited a beautiful house on the Schuylkill, and she remarked upon the nice tree plantings there.[109] In April of 1838 George Brooke wrote from Hopewell to his sister Sarah that the garden was in fine order.[110] While this information does not offer specific

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[106] Hopewell Document 8330400, April, 1833. Microfilm Roll number 357.

[107] Hopewell Document 8330602A, June 2, 1833. Microfilm Roll number 357.

[108] Hopewell Document 8330602D, June 2, 1833. Microfilm Roll number 357.

[109] Hopewell Document 8350622B, June 22, 1835. Microfilm Roll number 358.

[110] Hopewell Document 8380416, April 16, 1838. Microfilm Roll number 361.

information regarding the grounds around the Big House, it does serve to demonstrate the family's horticultural interest and, in part, supports later descriptions of large flower gardens and ornate garden structures.

The Furnace records do show numerous entries for paying for "gardening", "garden work", or "the gardener" beginning in the late 1820's and continuing up through the 1850's. The period from 1834 through 1852 had the most frequent entries.[111] The Furnace records do not indicate what kind of gardening was being paid for: vegetable and kitchen gardening to supply the moulders kitchen and company store, or ornamental gardening around the Big House, or both. One might assume both, however, no reference to ornamental plants or flower seeds can be found in the furnace records. But since the Brooke's personal expenses are generally not recorded in the furnace records one can not be certain that gardening for the Big House grounds was not paid for out of the Brooke's personal expense account. Besides the gardening entries

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[111] An undated document lists filling furnace and gardening in 1827 and 1828. Other garden references noted are in 1830 Frederick Moyers: Feb., 6 days and July, $6^{1}/_{2}$ days. In 1834 Aquilla Boudly: Jan., 3 months 15 days; Wm. Paige: May, 1 month and Nov., approx. 3 months. In 1835 Levan Coxen: Aug., $81^{3}/_{4}$ days. In 1836 Levan Coxen: Jan., $83^{3}/_{4}$ days. In 1837 Samuel Sanders: Jan., 7 months $23^{3}/_{4}$ days. Samuel Sanders continued to receive payments for garden work four times yearly from 1838 through 1843. In 1845 John Dougherty: Oct., almost 2 months. In 1846 John Dougherty: Jan., approx. 3 months. In 1847 Samuel Sanders: Jan., 2 months 25 days and in Aug., 4 months 1 day, and in Nov., 3 months. In 1848 Samuel Sanders: Jan., 1 month 24 days. In 1849 John Damon: June, $6^{1}/_{2}$ days and Sept., 3 months 24 days. In 1851 Jacob Bremer: April, 17 days, and in June, 1 month 12 days. In 1852 Samuel Whitman: June, 1 month 12 days, and Sept., 2 months 21 days, and in Dec., 3 months.

found in the Furnace records, an 1867 entry records paying Healy and Ehrgood for "boards, plank and scantling for garden $9.56" which suggests that a lattice work structure was being built.[112] The cost of $9.56 is quite high, too expensive for the boards used to set up a traditional raised bed kitchen garden. Another entry from 1871 specifically pays Henry Houck $4.50 "for making lattice work for garden."[113]

MANSION PRIVIES

The oral histories describe both the ice house pavilion and the double outhouse at the Big House as having lattice work. The mansion privy has been described by Russel Apple from the oral histories.

> Only a small depression now marks this site. Long said that the privy was frame and a square in plan, with each side about eight feet long. A partition divided the privy into two sections, with a ridge which ran north and south. A partition divided the privy into east and west sections; thus the partition would probably have existed under the ridge. The east side was for servants employed in the Mansion, and the west side for the Ironmaster's family. Doors were on the east and west sides. The privy was finished with lath and plaster and had a shingle roof. Paths came to the privy from the Mansion, one from the front and side doors which led to the west side, and one from the back of the Mansion which led to the east side for the servants.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936.)

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[112] Hopewell Furnace Record SM34 p179b, Oct. 28, 1867.

[113] Hopewell Furnace Record SM34 p210b, Aug. 3, 1871.

> Long later changed his estimate of the size of the building to say that it was 10 by 12 feet in plan.(Long, Comments on notes made during interview of Aug. 7, 1936.) Identification of this building was confirmed by two other informants.(Messrs. Reginald Evans and Emlen Osbourne Smith, interview by Motz, Aug. 4, 1940; Map of Mansion Gardens by Mrs. Mary Krewson, n.d., hereafter cited as Garden Map, NHS-HV-3001. A copy of her original map was made Aug. 10, 1955 and given this drawing number. Her map was probably drawn circa 1941.) Mrs. Mary Krewson, who, about 1941, drew a map of the Mansion Gardens as she remembered them in her youth, indicated that the toilets had a latticed ventilator and that the entrance on the west side was flanked or covered with lattice work which in turn [was] covered [with] what she called "trumpet vine."(Garden Map, NHS-HV-3001.)[114]

Harker Long, on the other hand, recalled "...a nice grape arbor from the bridge over the race to the house closet."[115] A note for clarification of the Big House privy; when Harker Long referred to it as being plastered he would have been referring to the interior walls, not the exterior of the building. Harker Long was one of the last managers at Hopewell. Mr. Long came to Hopewell in 1867 and worked as bookkeeper, furnace superintendent, and caretaker.[116] He began managing after Dr.

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[114] Russel A. Apple, Documentation for the Historical Base Maps, Hopewell Village National Historic Site (Washington, D.C.: United States Department of the Interior- National Park Service, 1956), p.II:21-II:22.

[115] Historical Accounts- K-L: Kemper, Jackson (1936), p. 1. Although cataloged and filed as Kemper, the interview is with Harker Long, Mr. Kemper was the historian who conducted the interview and wrote up the transcript.

[116] Ibid., p.21. Harker Long, Verbatim notes taken by Roy E. Appleman. Dec., 1935.

Clingen's death in 1875.[117] In 1964 archeologist Leland Abel excavated the circa 1876 Big House privy and found that the foundation was 6 by 7 feet. The archeological dig also uncovered a layer of plaster fragments which presumably came from the interior of the structure, reinforcing the information gathered from the oral histories. Mr. Abel also excavated a circa 1830 to 1840 privy 40 feet north of the 1876 privy.[118]

ICE HOUSE-SUMMER PAVILION

Apple's report described the ice house pavilion as follows:

> This location and identification [was] confirmed by nine interviewees, including Long.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936, p.18; Mr. and Mrs. Morris Lyman Care, interview by Gale, Feb. 6, 1941; Mrs. Daniel (Violet) Care, interview by Gale, Feb. 13, 1941; the Messrs. Smith, interview by Motz, Aug. 4, 1940; Hunter Care, interview by Kurjack, Mar. 14, 1948; Mr. and Mrs. Charles Sheridan Care, interview by Gale, Feb. 24, 1941.) Five of the interviewees, including Long, indicated that the Summer House was of lattice work, and four, including Long, said that there were stone steps which led up to the floor of the Summer House. One of the women interviewed remembered that the Summer House was covered with vines, type not specified. This woman, a daughter-in-law of Nathan Care, the Hopewell Manager, lived in the Iron Master's Mansion from 1915 to 1936, and while her testimony concerning the vines sounds

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[117] Walker, p. 62.

[118] For more information regarding the Big House privies see Leland J. Abel, "Archeological Data, Ironmaster's House (including toilets)" (1964), Hopewell Furnace National Historic Site Archives.

logical, her information concerning the steps is more important. She said that the steps were moved circa 1920 to become the foundation of the bridge-like extension on the rear of the Mansion.(Mrs. Daniel (Violet) Care, op. cit.) Mrs. Mary Krewson, on a map she drew of the garden as she remembered it from her girlhood, indicated that vines, probably ivy, covered the Summer House.(Garden Map, NHS-HV-3001.)

Both Mrs. Krewson and Long said that the Summer House was octagonal, that benches lined the inside walls, and Long added that it had an eight gable roof. Mrs. Krewson's map also indicated that the Summer House was Lattice.

The foundations of the Summer House were the walls of an underground Ice House. The walls of the Ice House protruded above ground varying from one foot at the highest contour to three feet at the lowest contour, thus steps were needed for access to the floor of the Summer House. The inside dimensions of the Ice House, which Appleman described as a stone walled pit, were 15 by 15 feet by 20 feet deep. When Appleman viewed the ruins in 1936 he said that the pit was then eight feet deep and about 15 feet on a side, which indicates that the Ice House was a square structure.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936.) Mr. Francis M. Lucas, a National Park Service Maintenance man who has been employed at the village since 1932 by different employers, said that the pit viewed by Appleman was later filled in by the Civilian Conservation Corps with ashes and rubbish. Thus, if the Ice House site is ever excavated by an archeologist, the artifacts found in the first eight feet will be modern. Only a slight depression now marks the site.

A trap door in the floor of the Summer House gave access to the Ice House below. Long indicated that this door was on the west side, and therefore, the trap door would be near the door of the summer house, a convenient arrangement for loading ice. The ice came from Hopewell Lake, near the dam. A ladder was used for access to the pit, and rye straw lined the pit and was used to cover the stored ice.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936.)

> Long specifically stated that the Ice and Summer House was in existence when he came to Hopewell Village in 1867.(Long, Verbatim Notes 1935.)[119]

In 1958 Regional Archeologist, John Cotter, uncovered the ice house pit but did not excavate it.[120] There have been only three references to the ice house found in the Furnace records. The first one dates from 1834, "Furnace Dr. to sundries for work done from the 1st of Sept. last up to this date as p. time book - To David Smith for 2 days work done at the ice house @.40 .80"[121] The other two entries are for "1 day helping to put in ice" in 1850, and a marginal note for "putting in ice" in 1857.[122]

GREENHOUSE

One of the most interesting structures on the Big House grounds was the greenhouse. Historians in the past have grappled with various attempts to positively identify the exact date of construction of the greenhouse. Although herculean efforts have been made to pin-point the exact date, the age of the building

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[119] Documentation for the Historical Base Maps , p.II:25-II:27.

[120] John L. Cotter, "Archeological Tests, Hopewell Village National Historic Site: (1) Garden Area of Ironmaster's House, (2) Parking Lot Extension, (3) Entrance to Charcoal House." (Hopewell Furnace National Historic Site Archives, July 1958.)

[121] Hopewell Furnace Records SM21 p.85b, Jan. 1, 1834.

[122] Hopewell Furnace Records SM32 p.84b, March 29, 1850 and SM35 (marginal note) Jan. 2, 1857.

still remains somewhat speculatively dated at 1829. One thing that is certain, however, is that the building fits well within the period of interpretation for the Big House. The information that Mr. Russell Apple compiled from the oral histories and combined with information gained from Mr. Motz's archeological tests at the greenhouse resulted in the following description which has been excerpted below:

> The overall dimensions of the Greenhouse were approximately 60.5 feet long and 24.9 feet wide.(Field Notes, Greenhouse Job No. 646, by J.C.F. Motz, Jan. 6, 1941.) The Walls appear to be 18 or 20 inches thick. The height of the north wall was approximately seven feet above the floor.(Drawing, Green House, Plan and Sections at East End of North Wall, by J.C.F. Motz 1941) The height of the now absent south wall was probably four feet,(Long, Verbatim Notes 1935.) if this side had a stone foundation. Archeologist Motz, who excavated [three test trenches at] the Greenhouse in 1941, believed that the south wall was built entirely of glass. Motz indicated that the floor sloped sharply upward toward the north,(Motz, memo. for Superintendent, May 28, 1941, p.1) and thus the slope of the floor approximated the slope of the roof. Probably the south side was of glass which rested on a stone foundation. Interviewees state that there were glass sides and roof.(Long, Verbatim Notes 1935; Mr. and Mrs. Charles Care, interview by Howard Gale, Feb. 24, 1941; Mr. and Mrs. Morris Lyman Care, interview by Howard Gale, Feb. 6, 1941.) Motz found much broken glass in his dig.(Field Notes, Greenhouse Job No. 646, by Motz.) Doors, as indicated by standing walls, were in the center of the east and west walls. Long indicated that the "sash" (roof of glass?) was about 20 feet wide. He also said that two-thirds of the Greenhouse was a grapery; that this grapery was at the east end; and that there was a partition which separated the grapery from the hot-house, which was used for the cultivation of flowers. There was a door in

> the partition.(Long, Verbatim Notes 1935.) Heat, according to Long, was supplied from a heating plant which stood in the southeast corner, and was distributed through terra cotta pipes.(Long, Verbatim Notes 1935.) Two Pieces of terra cotta pipe were found by Motz.(Field Notes, Greenhouse Job No. 646, by J.F.C. Motz, p.4.) About 1877, 54 feet of terra cotta pipe were bought by Hopewell from Raylond Mohn at 8 cents a foot.(SM 34, p. 258a. The date is approximate, and was arrived at by the dates of nearby entries.) Another informant placed the heating plant at the west end,(Mr. and Mrs. Charles S. Care, interview by Howard Gale, Feb. 24, 1941.) and another said that the Greenhouse was heated by coal stoves, number not stated.(Mr. and Mrs. Morris Lyman Care, interview by Howard Gale, Feb. 6, 1941.)[123]

J.C.F. Motz conducted his archeological investigations in January, February, and March under time constraints, therefore a complete official report was never made.[124] It seems clear that a more complete archeological dig could do much to clarify some of the important features of the structure. For example, the heating units of hot-house structures were often constructed below floor level so that the heat could rise from the floor beneath the plants. Debris and fill around the ruin could

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[123] Documentation for the Historical Base Maps , p.II:11-II:12.

[124] J.C.F. Motz, "Field Notes, Greenhouse Job No. 646.", 1941. The notes stated that the southwest corner was where the heating and plumbing was said to have been (p. 2). In February he uncovered an interior brick walk, a lead pipe, and the remains of a water barrel (p. 15). His findings along the north wall were inconclusive. In April he discovered that the north wall appeared to be built on top of an earlier foundation. He found white washed stones in the trench and was baffled by the foundation which he thought was possibly a terrace wall, a retaining wall for a road, or even a building.

completely obscure the location of the furnace and flues, if this were the case, more thorough archeological investigation might locate the furnace.

U.P. Hedrick in A History of Horticulture in America to 1860 explained:

> Greenhouses in the first 60 years of the nineteenth century were small, crude buildings, of which roofs and sides were usually portable sashes. The framework of these sashes and of the building was so thick, that too little light reached the interior of the buildings. In 1854 William Saunders, a Scotch gardener, entered into partnership with Thomas Meehan of Philadelphia, and soon after built the first greenhouse in America with a fixed roof, a great improvement over houses with moveable sash. In 1855 Frederic A. Lord built in Buffalo a greenhouse with a fixed roof, with glass of larger size than had been used before, and embedded in putty instead of placed on the outside, as had been done in houses with sash-roofs.[125]

It should be recalled that during this period the plants were grown in pots and tubs and rarely in soil filled benches. Hedrick points out that most of the flowers were small and short stemmed such as camellia, bouvardia, heliotrope, tuberose, and mignonette, and that long stemmed flowers were not grown much until after 1870.[126] Also, regarding the size of glass used in greenhouses, it should be pointed out that it was not until 1847 that James Hartly developed the sheet glass process; prior to that, large sheets of smooth, bubble-free glass were not

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[125] Hedrick, U.P. A History of Horticulture in America to 1860. New York: Oxford University Press, 1950, p. 267.

[126] Ibid., pp. 267-268.

generally available.[127]

Two Philadelphia publications, both Bernard M'Mahon's American Gardener's Calendar, published in 1806, and Robert Buist's The American Flower Garden Directory, first published in 1832 with new revised editions being published throughout the nineteenth century, give detailed directions for the construction of hot-houses. Robert Buist was a prominent Philadelphia nurseryman and florist. The knowledge currently compiled about the Hopewell greenhouse ruin generally matches the construction descriptions given in period publications. My research indicates that Hopewell Furnace was a customer of Robert Buist and, therefore, his publications may have been familiar reading at the Big House.[128] In any case Buist's directions can serve as a guide to what was practiced at the time. I believe, it will be useful at this point, to supply below a copy of the section "On The Construction of a Hot-House" taken from Robert Buist.

THE
AMERICAN FLOWER GARDEN
DIRECTORY.

HOT-HOUSE.

ON THE CONSTRUCTION OF A HOT-HOUSE.

There have been many plans devised and visionary projects offered to the public as the best for a well-regulated hot house. As we intend forming one for practical purposes,

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[127] Brent Elliott, Victorian Gardens (London: B.T. Batsford Ltd., 1986), p. 17.

[128] Hopewell Furnace Record SM31 p. 122b, April 29, 1850 "Paid R. Bruist [sic. R. Buist] for garden seeds- $1.50"

we shall adopt a convenient size, have flues for the conveyance of heat, and coal or wood for fuel.

Site and Aspect. - The house should stand on a situation naturally dry, and, if possible, sheltered from the north-west, and clear from all shade on the south, east, and west, so that the sun may at all times act effectually upon the house. The standard principle, as to aspect, is to set the front directly to the south. Any deviation from this point should incline to the east.

Dimensions. - The length may be from ten feet upward; but, if beyond forty feet, the number of fires and flues are multiplied. The medium width is from twelve to sixteen feet. Our directions will apply to the two extreme points, viz.: forty feet by sixteen, and in height, at back, from twelve to eighteen feet; the height in front six feet, including about three feet in brick basement, to support the front glass, which will be two and a half feet, allowing six inches for frame-work.

Furnace and Flues. - It is of great importance to have these erected in such a manner as will effectually heat the house. The greatest difficulty is to have the furnace to draw well. As workmen are not generally conversant on the subject, nor yet understand the effect or distribution of heat in these departments, we will give minute details on their construction. The furnace should be outside of the house, either at back or end; the former is preferable, circumstances not always allowing it on the other plan. Dig out the furnace-hole, or what is termed stock-hole, about five feet deep. Let the door of the furnace be in the back wall of the house, thereby having all the heated building inside, that no heat may be lost. The brick-work round the furnace should be nine inches thick, laying the inside with fire-brick. Around the outside leave a vacuum two or three inches wide, to allow the heat to arise from around the furnace into the interior of the house, thereby saving the whole heat of the fuel. The furnace will require to be two and a half feet long, ten inches wide, and one foot high, before the spring of the arch and clear of the bars; leave one foot for an ash pit,

then lay the bars. They should be sixteen inches long, one inch broad on the upper side, two inches deep, and two-eighths broad on the lower side, and, with the door and frame, should be cast iron. Half an inch between each bar will be sufficient. The flue should rise from the furnace by a steep declivity of from twenty inches to two feet, and pass the door of the house, (without a dip,) when it must be elevated above the level of the floor of the house along the front, and at the opposite end of the house must dip to pass the door. The dip must not be lower than the bottom of the flue at the neck of the furnace, and should be of a concave form, (avoiding acute angles.) Lead it along the back to enter the wall over the furnace. When thus taken round the house, the heat will be expanded before it enters the chimney. The inside of the flues should be from six to ten inches wide, and eight inches deep; plaster the bottom of it, but no other part, as plaster is partially a non-conductor. The above description is for burning anthracite coal; but where wood is to be fuel, the furnace must be one-half larger. We have been particular in the description of furnace bars, as those generally used are miserable substitute. Circumstances may cause the furnace to be placed at the end or front of the house. In either case the stock-hole will not require to be so deep; or where there is only one door in the house, a stock-hole three and half feet will be deep enough, which should be built like a cellar, to keep out any under water. In all instances pass the first flue to the front of the house, over which have a close table, covered with two inches of sand, and, by keeping it moist, will afford a very congenial heat to young and valuable plants. Likewise over the furnace have a frame in the same manner, which will be found useful for propagating. Any part of the furnace or flue that is under the floor of the house, should have a vacuity on both sides to let the heat pass upward.

Furnaces and flues on the above construction are the most simple arrangement, and the easiest to manage at all times. But were capital, taste, and practical science can be united, a more elegant disposition of

heating can adopted: an excavation should be made to pass along under the pathway, which pathway may be a casting of iron, or wooden slats, fancifully put together, and at least six inches above the flue. In building the furnace, place thereon a boiler of cast-iron or copper, about two feet deep, two feet long, and four inches wide, with a zinc or copper lid: having it prepared to receive two pipes, one near the bottom and the other about four inches from the top: these pipes may be from four to six inches in diameter, and are to be taken along under the table in front of the house, in a level position, and, at the end of the house, joined together by a perpendicular pipe, or joint which should have an end about one foot higher than the highest part of the upper pipe. When all is properly fixed, fill the boiler with rain or river water, if possible: the air in the pipes will pass out at the perpendicular end, and, when all are full, put a perforated cover on the end of the pipe. As soon as the water becomes heated, it will arise from the bottom of the boiler, and pass along the upper pipe, and return cool by the under one. Or, in place of the pipe again by the front, it can pass all around the house, only there must be a piece of perpendicular pipe to allow air to get out- the consumption of water will not be over half a gallon in twenty-four hours. If the pipes require to be higher than the boiler, the boiler cover must be hermetically sealed, and the filling operation conducted by the upright tube or pipe, which must always be full of water. This we consider the economical method of heating by water, and it is by far the most simple- simple indeed in every part, though volumes have been written on the subject.

Bark Pit. - We consider such an erection in the centre of a hot-house a nuisance, and prefer a stage, which may be constructed according to taste. It should be made of the best Carolina pine, leaving a passage all around, to cause a free circulation of air. The back and end paths may be about two feet wide, and the front three feet. The angle of the stage should be parallel with the glass, having the steps from six inches to one foot apart.

Where there are some large plants, they

may stand on the floor behind the stage, or on tressels, according to their height.

Angle of the glazed Roof. - The pitch of the roof is usually varied to agree with the design of the house, and the size of the plants to be grown therein. Where pleasure and ornament are the principal objects, the angle should be about 43°, but a few degrees of inclination either way is of minor importance. [The 1852 edition says, "...about 33° from the level line...[129]]

Materials for glazed Sashes. - Carolina pine is the best material for the wood-work, as it is not subject to decay from moisture and heat as other kinds of pine wood. The frames or sashes can be of any convenient length, not exceeding ten feet, and about three and a half or four feet wide, and made from plank two inches thick, divided so as they can be glazed with glass six inches wide.

Of Glazing. - The pieces of glass should not exceed six inches by eight, though six is preferable; the lappings about one quarter of an inch. The frames ought to have two coats of paint previous to glazing, and the glass bedded in putty. Some prefer the lappings to be puttied also. It is our opinion that in a hot-house these should not be puttied, but, in the green-house the closer they can be made the better.

Of Shutters. - These should be made of three quarters of an inch white pine, and bound on both ends and sides, having a cross piece in the middle of the same. They ought to be painted at least once in three years.[130]

... OF PAINTING, REPAIRING, AND CLEANSING THE HOUSE.

The necessary repairs of the hot-house are too often put off to the last day or week; and then with hurry are superficially attended to. Previous to the first of September, have the wood-work painted, (which ought to have one coat every two years,) and the glass all neatly repaired. Have the

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[129] Robert Buist, The American Flower-Garden Directory. (Philadelphia: A. Hart, late Carey and Hart, 1852), p. 133.

[130] Robert Buist, The American Flower-Garden Directory. (Philadelphia: Carey and Hart, 1841), pp. 145-149.

> flues and furnace examined; plaster over all rents and make good every deficiency. Give the flue a thick coat of lime white-wash. Have the walls, shelves, and staging properly painted. If there is a tan-bed, have that renewed; take out what is most decayed, using two-thirds new tan, which must be dried at least three days in the sun before it is housed, and carefully protect it from rains.[131]

The description of hot-houses given by M'Mahon in 1806 differ in some respects from Buist's. M'Mahon states that the glazing should be "...five rows of glass panes, six inches by four, overlapping one another about half an inch, which of all other sizes is most preferable, on account of their cheapness in the first place, the closeness of their lap, the general strength, the trifling expense of repairs..."[132] Both Buist and M'Mahon agree on how the furnace should be situated. However, M'Mahon describes the flues as "...internal flues or funnels, running the whole length of the back wall in three returns, one above another, and continued in a flue round the front..."[133]

The oral histories from Hopewell indicate that grapes were being cultivated in the greenhouse or, more properly, the hot-house. "Greenhouse" during the nineteenth century most often referred to structures of a more ornamental style or those which were frequently attached to the mansion-house to join a parlor or

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[131] Ibid., p. 200.

[132] Bernard M'Mahon, The American Gardener's Calendar. (Philadelphia: 1806), p. 10.

[133] Ibid., p. 40.

drawing-room.[134] By the second quarter of the nineteenth century about the most popular horticulture under glass was grape culture. Only two good varieties of grapes were able to be grown outdoors in the east, Catawba and Isabella. Hot-houses allowed one to grow a wider variety of grapes over a longer season.[135] Hedrick goes as far as to say: "In the 1850's the grape was receiving more attention from amateur fruit growers and plant breeders than any other fruit."[136] In 1832 the Furnace records show several payments for "dressing the vineyard," but make no reference to the hot-house.[137] In fact, no Furnace records refer to a "hot-house" or "greenhouse." The hot-house was probably not considered to be part of the Furnace operation and, therefore, should not be expected to show in Furnace records. The vine dresser was not a furnace employee as indicated by the records showing direct payments to him rather than debits to his account.

HOT-BED FRAMES

The Furnace records also show some payments for setting up

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[134] Robert Buist, The American Flower-Garden Directory. (Philadelphia: Carey and Hart, 1841), p. 209.

[135] U.P. Hedrick, A History of Horticulture in America to 1860 (New York: Oxford University Press, 1950), p. 266.

[136] Ibid., p. 492.

[137] Hopewell Furnace Record SM17: May 31, 1832; "By Furnace paid Jacob Hess for dressing vineyard in full up to this date- $2.50." July 9, 1832; "By Furnace paid the old vine dresser for dressing vineyard- $1.50." Dec. 1, 1832; "Ditto [Furnace] paid Jacob Hess for dressing vineyard- $3.50."

the hot beds.[138] Hot beds were often situated near hot-houses but they also were used to force plants in early spring for vegetable gardens. Robert Buist's directions on setting up a hot bed were as follows:

OF FRAMING

Where it is desired to have the more showy annuals early in bloom, it is necessary to prepare a hot-bed frame, for the purpose of bringing them forward. It is time about the first of the month [of March], to collect and prepare manure for the desired hot-bed; and, as that operation, in many instances, is very imperfectly performed, a few observations on the subject may be useful.

Take three parts of fresh hot stable manure, with one part of fresh oak leaves. Have a sufficient quantity to make the intended bed or beds from three to four feet high. Shake and mix up both together in a compact heap, in order to encourage fermentation. If the weather is cold and windy, cover it with straw or leaves and boards, which is necessary to produce the desired effect. If fermentation soon takes place, it will need to be thoroughly turned over in eight or ten days. If any of it has become dry and musty from excessive heat, as you proceed, water the affected parts, pile all up neatly, and leave it protected in part as before. In five or six days more, it will have to be turned again, repeating it until the first extreme heat has been over. In neglect of this, the heat, after making the bed, will be vehement for a week or two, frequently destroying the vegetative purity of the soil, and proving destructive to the seeds.

Allowing the manure to come to a lively heat, having no unpleasant, rancid smell, proceed to mark off your intended bed, running it east and west as nearly as possible, measure your frame, and allow the

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[138] Hopewell Furnace Records SM31 p. 113b Feb. 14, 1850 "By Furnace paid Draper Nixon for setting up Hotbeds- .50$^{1}/_{2}$" and SM35 (Time Book) Feb. 18, 1859 "Put up hot beds, wed. Feb. 18, 1859." Transcribed by Hopewell historian Earl Heydinger.

site of the bed eight inches each way larger than the frame: at the corners, place a stick or rod perpendicularly. The ground ought to be higher than that around it, to prevent water from getting into the bed, which, if low, must be filled up; or, if supposed that water may lodge there, a little brushwood might be put under the manure, which would keep it from being inundated. The manure must be built up square and level, shaking, mixing, and beating it regularly with the back of the fork. When you have it to the desired height, (from two to three feet will be sufficient for annuals,) leave the centre of the bed a little higher than the sides, thus allowing it more to subside. When finished, put on the frame and sash or sashes, keep them close until the heat arises, covering them at night with mats or shutters. As soon as you feel the heat increased, give air by tilting the sashes a few inches to let off the steam and stagnated air, observing to close in the afternoon, and cover at night. If the heat is violent, about half an inch of air might be left during the night. In about three days, if all has been properly attended to, the bed will be what is termed sweet. Then put in about six inches of fine garden soil; if heavy, mix a little sand with it. Spread it level, and, when the soil is heated through, sow in small drills from one eighth to an inch deep, according to the size of the seeds, cover with sifted soil. Some very small kinds do best when sown upon the surface. When sown, give gentle sprinklings of water until they come up, when it will be necessary to give air freely during the day to prevent them from being weak, or damping off, which many of them will do if they have not air regularly admitted.

LIST OF CHOICE FLOWERING ANNUALS ADAPTED FOR SOWING ON A HOT-BED.[139]

Argeratum mexicana, blue flowered Argeratum.
Asclepias curassavica, swallow wort, orange,

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[139] The original spelling has been maintained in this, and all other, quoted materials. The Latin names of plants are not always correctly spelled in the following list.

and red flowered.
Aster Chinensis, China Aster, or Queen Margarets, in great variety. The late imported German Asters are of extraordinary beauty.
Balsamine hortensis, Balsam, commonly called Ladies Slipper.
Browallia alata, upright blue and white Browallia.
Cacalia coccinea, scarlet Cacalia.
Calandrinia grandiflora, rose-coloured
Calandrin discolor, rosy purple.
Celosia cristata, Coxcomb, two varieties, red and yellow.
Centaurea americana, American Sultan.
suaveolens, yellow sweet Sultan.
Clarkia elegans, elegant rose-coloured Clarkia.
pulchella, showy purple Clarkia.
alba, white flowery Clarkia.
Cleome-grandiflora, large lilac flowering spider plant.
Clintonia elegans, elegant blue Clintonia.
Collinsia bicolor, two-coloured Collinsia.
heterophylla, lilac and white.
Commelia coelestis, china pink, many fine double varieties.
Gomphorina globosa, red and white Globe Amaranthus.
Hibiscus manihot, large yellow Hibiscus.
africanus major, buff with black centre.
Helichrysum bracteatum Yellow everlasting
Zeranthemum luccidum, " "
Lophospermum erubescens, Rose-coloured
scandens, flowers like the Digitalis, a fine climber for arbors.
Malope alba, white flowering Malope.
grandiflora, large red flowering Malope.
Mathiola annua, all the varieties of ten week stocks should be industriously cultivated,and seed sown also in April and May for autumn blooming.
Maurandia Barclayana, blue flowering,
semperflorens, pink flowering,
(Climbing plants for pillars, trellises or arbours.)

Mesembryanthemum glaciale, Frozen plant.
crystallinum, ice plant.
Mimosa pudica, sensitive plant. Will grow
Mimulus Wheelerii, monkey flower, best in wet
yellow and crimson. places.
Smithii, Smith's yellow
and red.
Variegated pink and white.
cardinalis, scarlet.
roseus, rose-coloured.
Petunias of variety, a beautiful genus of plants of every variety of color, from deep purple to pure white, blooming from June till frost; the seeds are small and require to be very lightly covered.
Portulaca grandiflora, great flowered Purslane.
Gilesii, rosy purple flowered Purslane.
Salpiglossus picta, atropurpurea, &c., delight in a cool situation.

Schizanthus retusus, orange Like a
coloured Schizanthus, rich soil,
Schizanthus pinnatus calico, and partially
Schizanthus Hookerii, and a shaded situ-
few other varieties. ation.

Shortia californica, yellow Shortia, very profuse flowering
Tagetes, Mary-gold, the new varieties of the French are very pretty - they like rich soil and plenty of moisture.
Tropaeolum aduncum, canary bird flower, a climber and a very scarce plant.
Tropaeolum atrosanguineum, crimson Nastartium.

Climbing
Thumbergia alata, buff with plants.
black centre.
alba or Fragrans, white flowered.
Verbena aubetia, rose-coloured. A lovely
bonariensis, light blue. family of
erinoides, light lilac. pretty and
Drummondii, rosy lilac. profuse
pulchella, Procumbens, flowering
purple lilac. plants
sabiniana. generally
of a pro-
cumbent habit.
Vinca rosea, Madagascar Periwinkle. Thrive

alba, white flowered Periwinkle.	best in a warm, dry, situation with rich soil.
Zennia elegans, splendid Zennia. coccinea, scarlet. alba, white. pauciflora, yellow.	Very showy plants, and do best when they are well supplied with water.[140]

GARDEN TOOL HOUSE

The garden tool house was located a short distance south east of the greenhouse. Only a foundation depression is visible today. Harker Long remembered that the garden tool shed was a small frame structure with a stone foundation located near the east end of the hot house. He estimated the size was about eight by ten feet.[141] Mrs. Krewson also recalled the structure which she called "the seed house;" as a child she used to play in the little "doll-house."[142] Not surprisingly, there is no documentation in the Furnace records specific to the structure itself. However, perhaps even more interestingly, there is an 1858 inventory of the contents of the building:

Acnt. of Garden tool in Garden

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[140] Robert Buist, The American Flower-Garden Directory (Philadelphia: Carey and Hart, 1841), p. 24-25.

[141] Harker Long, Verbatim Notes taken by Roy E. Appleman. Dec., 1935.

[142] Mary Krewson, "Map of Mansion Gardens," n.d. Garden Map, NHS-HV-3001, Hopewell Furnace Archive.

When Bodely commenced March 18th, 1858
2 Iron tooth rake 1 wooden rake
1 shovel & 2 garden hoes
2 open Hoes for weeds 1 sive
1 tin water pot & 1 small saw
2 Erthen dishes & 1 draw Knife
1 wooden Square 6 small boxes to put seed in.
1 willow Basket & 1 pair of shears for cutting [Grass illeg.]
2 Plates & 1 small trowel
1 small iron pick 1 line & iron frame
1 iron fork broad prongs
28 flour potts some of them cracked
4 do. do. 1 Hatchet
1 hammer [143]

When compared to an 1862 description of "A Few Convenient Garden Tools" one can see that the garden shed at Hopewell was rather well equipped.[144] The inventory was probably not taken by a gardener and, therefore, is laking some of the proper terminology and detail that may have otherwise been available. However, one is still able to get a fairly clear idea of what was there. The two iron tooth rakes were most likely standard garden rakes. The wooden rake was probably a grass rake. "A grass rake is one of the most convenient tools we have used. It is simply a hay rake, with at least twice as many teeth as the common hay rake. The teeth are shorter, and of course closer together. This gathers up the clippings of the grass plot very clean. We

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[143] Hopewell Furnace Record SM35 p. 126 Marginal Note, March 18, 1858. Written in margin opposite Wed. 24, March 1858.

[144] An 1862 article reprinted in The Compleat Farmer compiled by the Main Street Press (New York: Main Street/Universe Books, 1975).

hay in the garden, and the grass never should be more than 4 inches high. All that this rake will not gather is best left on the sward as a mulch for the roots; it will not show, perceptibly."[145] The one shovel listed was needed "For moving loose earth, sand, compost, etc., a shovel is indispensable, except in a very small garden. So also is the common field hoe."[146] Two common garden hoes are listed. A somewhat more curious entry is for "2 Open hoe for weeds." These hoes are properly called shuffle hoes. "The shuffle hoe, often wrongly called 'scuffle hoe,' is a very convenient implement for working among plants. If provided with a long handle, it saves the back from many an ache, and some wear on the fingers. The blade should have both edges sharp, and then in shuffling it backward and forward, it cuts both ways, severing the weeds, and leaving them on the surface, and lighting the soil. We advise its general adoption."[147] The "sive" or sieve would have been needed if the gardener wished to save seeds. After breaking up the dried seed pods, the extraneous plant dust and debris must be separated from the seed. This can be accomplished with sieves. First the seed was shaken through a sieve with holes or mesh slightly larger than the seed. The seed, small particles and dust drop through. Then the seed can either be shaken in a

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[145] The Compleat Farmer compiled by the Main Street Press (New York: Main Street/Universe Books, 1975), pp. 77-78.

[146] Ibid., p.77.

[147] Ibid., p. 78.

second, smaller, sieve that allows the dust to drop through and not the seed, or it can simply be winnowed. Winnowing was done by placing the seed in a large diameter, shallow, round bottom container and gently tossing it in the air to allow the wind to carry off the dust and small particles.[148] This may well be how it was done at the Big House garden since only one sieve is on the list. The tin water pot on the list is self explanatory, it was used for sprinkling water on freshly sown seeds and on plants. The small saw on the list could have been either a branch saw to be used for pruning trees and shrubbery, or it could have been a carpentry saw used in conjunction with the draw knife and hammer when setting up hot frames or repairing trellis, garden furniture, or other garden structures. The two earthenware dishes could have been used for a number of things depending on the size. For example, they could be used under flower pots. The two plates may have also served this purpose. It is somewhat odd to find a draw knife on the list of garden tools and, one wonders, if the person taking the inventory did not recognize a tool and misnamed it. A draw knife has a very distinctive shape, however, and it would be difficult to think of another tool with a similar appearance. The inventory was taken in March, the time when hot frames are set up. The draw knife may have been used to assure a close fit between the frame sides and its sash lid. The wooden square also would be needed when

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[148] Carolyn Jabs, The Heirloom Gardener (San Francisco: Sierra Club Books, 1984), pp. 224-225.

hot frames and other garden structures were built or repaired, as well as when beds were being laid out. Fortunately, we have been told by the person taking the inventory that the 6 small wooden boxes were "to put seed in." The willow basket would serve to carry countless numbers of things around the garden. It was a handy, sturdy, and utilitarian object. The pair of shears mentioned on the list would be expected to be found in a garden shed. They typically would be used for cutting stems of plants, such as roses and small shrubs. Although somewhat difficult to understand, it appears that the person taking the inventory had written that the pair of shears were for cutting grass. Perhaps he had seen a gardener use them to trim grass around garden structures such as trellis and fence posts. There is no scythe on the list and, although the lawn mower had been invented in 1833 by Edwin Budding in England, it would be over 30 years before lawn mowers became practical and started to be used commonly. In fact, in the late 1850's in England, some were even promoting the use of lawn substitutes that would not require mowing.[149] The fact that no scythe is on the Hopewell list may indicate that the gardener did not cut the grass, but rather, that a laborer came to cut the grass at the Big House when it was necessary. The small trowel on the list obviously refers to a garden trowel. The author of "A Few Convenient Garden Tools" discouraged the use of dibbles and promoted the use of the garden trowel instead: "...a much better hole is made with a trowel or

[149] Elliott, p. 16.

flat stick, inserted and pressed to one side; the soil is not then compressed on all sides. Still the dibbles are very convenient in rapid work, and in the field."[150] The fact that no dibbles are on the list might seem surprising at first, it might even reflect the more refined gardening that took place at the Big House, or it simply reflects that the person taking the inventory didn't know what a dibble was. At any rate, I believe that the use of the garden trowel for digging and transplanting is familiar enough to most readers that it need not be discussed in great detail. The notation of "1 small iron pick 1 line & iron frame" appear to be written as if they belonged together and might refer to a stake, line, and reel used to lay out beds. "The reel and line of the form shown in our cut, is most convenient, but any cord wound upon a pointed stake, with another short stake attached to the end, will answer the purpose well. A strong cord of good size is preferable to a string. It should be strong enough to bear a hard pull. The garden line serves a more important purpose in giving a garden symmetry and regularity which marks a well kept place, than any other implement. A long line made so strong as to bear stretching, yet so small in diameter as not to be swayed by the wind, is preferable. It should be housed at night away from dews."[151] If the pick, line and frame do not actually belong together, but have only been written in one line as a coincidence of casual notation, then the

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[150] The Compleat Farmer, p. 78.

[151] The Compleat Farmer, p. 77.

small iron pick is very likely to be a description of a dibble. Dibbles were used to poke holes into the soil for planting seeds. The iron frame remains a mystery to me. Note that although the shovel had been listed, no flat bladed spade is present. The reason for this is that although: "The spade is necessary to dig holes, drains, etc., to cut turf, to move small quantities of earth in making beds, etc., to divide masses of shrubs or other plants, to take up trees, and the like, but it no longer holds the place of honor. The spading fork is the usurper."[152] The spading fork is what the gardener at the Big House used. If one looks near the bottom of the garden shed inventory one will see the spading fork described as "1 iron fork broad tongs." The author of "A Few Convenient Garden Tools" expounded that the spading fork "...is <u>the</u> implement for working the soil. It penetrates the ground with greater ease, and lifts the soil as the spade, leaving it light and crumbly, not in soggy lumps. We prefer a five tined fork, the tines bevel-backed, and gradually and very slightly increasing in width from the tread to the points, so as to prevent stones from catching between them."[153] The 32 flower pots in the garden shed would have been needed for the plants in the hot house. The last items on the list are the hammer and the hatchet, I think that the use of these two tools is clear enough, and that no further explanation will be needed.

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[152] Ibid., p. 76.

[153] Ibid., p. 77.

SMOKEHOUSE AND SPRINGHOUSE

The exact site of the original smokehouse is uncertain. In 1969 Emma Lapsansky directed the excavation of five test trenches behind the bake ovens in the area that the smoke house was reported to have stood. A 14 foot length of stone wall was excavated but it could not be determined if the wall was part of a building foundation or just a retaining wall.[154] In 1971 John Cotter continued the archeological search for the smokehouse at the site were Lapsansky had found the wall. The dig failed to locate a corner for a foundation outline. A wall-like formation was uncovered suggesting that a north south interior wall may have been uncovered.[155] In 1980 additional archeological tests were conducted by Ellen Seidel in preparation for the installation of a French drain behind the Big House. The tests were shovel test pits and, unfortunately, no features were identified. However, when the backhoe dug the drain through the area of Lapsansky's and Cotter's digs possible retaining walls, pipes, rocks and artifact concentrations were discovered.[156] The

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[154] Emma Lapsansky, "Excavations at Springhouse and Smokehouse, Hopewell Village National Historic Site, Elverson, Pennsylvania." (July 10-16 1969).

[155] Elizabeth Graff, "Preliminary Report on the Activities of Class 572, Historical American Archeology at the University of Pennsylvania" (Department of American Civilization in the Second Summer Session, 1971).

[156] Ellen Seidel, "Archaeological Monitoring in Historic Structures Report, Ironmaster's House, Structure 1" (August, 1980).

existence of a smokehouse is well documented in the oral histories, but there is conflicting information given by the informants. The Furnace records indicate that in 1828 a smokehouse was being built, or major repairs and additions were added to an existing one. "To Evans and Sands for 79 perches mason work at smokehouse Nov. 10, 1828 @.26 20.54 for $4^1/_2$ days plastering smokehouse @.75 $3.37^1/_2$ 2 door sills @$62^1/_2$ 1.25- [total] $\$25.16^1/_2$."[157] The Furnace records do not indicate were the smokehouse was being built, but it is fairly likely to have been at the Big House. Apple's report gives the following description based on the information compiled from the oral histories:

> "There is now nothing on the ground to indicate the former presence of this building. The location and identification were confirmed by seven informants and by Long several times.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936, p. 22; Long, comments on notes made during interview Aug. 7, 1936; H. Johnson, interview by Voorhis, June 23, 1939; Messrs. Smith, interview by Motz, Aug. 4, 1940; Mr. Nathan Care, interview by Motz, Feb. 3, 1941; Mrs. Sally Boone and Mr. David Boone, interview by Motz, Mar. 22, 1941; William Painter, interview by Kurjack, July 24,1949.) The informants split their vote, however, when it came to construction details. One voted for frame, one for stone, one for a log building, and the rest for a log building resting on a stone foundation. It could be that the votes for the stone structure and for the log structure referred to different aspects of the same building. Except for the one mention of frame construction, the interviewees seem to agree with Long who gave the more detailed description. Long said

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[157] Hopewell Furnace Record SM14 p. 33a, Nov. 19, 1828.

> that the building was about 30 feet square in plan, and that the ridge ran east and west. Because the Smokehouse stood on a slope, the rear or north side of the building had a stone wall of approximately two feet in height, and the front or south side had a stone wall eight feet in height. The upper or log portion of the building rested on stone walls and continued upward another five or six feet. The interior was divided into two sections, an east and west section, the partition then ran at right angles to the ridge. Two doors existed in the south wall, each opening into a section. No mention is made of a door through the partition, but this does not exclude the presence of one. [Although why would one be needed?] A large plank cutting table was built against the wall in the west section.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936, p. 22.)
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> A "long time ago..." it was used to smoke meat in, Long said in 1936. He indicated that meat was butchered in the village and then smoked and sold to employees.(Long, Comments on notes made during interview Aug. 7, 1936.) Agreement on the partition was given by one other interviewee.(H. Johnson, interview by Voorhis, June 23, 1939.)[158]

It is of interest to note that Mr. Long described a large plank cutting table built in the building because Mrs. Boone (born in Hopewell 1854) called the building "a smoke and meat house."[159] These descriptions indicate that the building served the dual purpose of smokehouse and butcher house, the west room was for cutting and the east room was for smoking. Today there is a frame smokehouse which stands north of the springhouse. The area

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[158] Documentation for the Historical Base Maps , p.II:23-II:24.

[159] Interview with Mrs. Sally Boone and her son David, taken by Motz (March 22,1941), p. 3.

around the springhouse and smokehouse would have been bustling with activity during butchering times. The animals would have been slaughtered down near the barnyard. Oral tradition has it that a bull-ring was located behind the office-store and that the carcasses were also hung at the office-store.[160] A bull-ring through which the lead rope of cattle could be pulled tight was needed so that the steer's head could be lowered and held to receive a stunning blow before its jugular was cut. A person could become badly kicked or seriously injured if the beast were not held firmly. The ring was not needed for smaller animals or for pigs. Pigs had to be scalded in a trough or tilted barrel filled with hot water so that their bristles could be removed prior to evisceration. After the animal had been killed and had been eviscerated, skinned and quartered, the pieces would then be carried away for cutting and preparation. The Furnace records show numerous debits to the accounts of Hopewell workers who helped with butchering and cutting meat.[161] It appears that at

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[160] Historical Accounts- Care Family. Care, Nathan and Violet (1941), p. 6. "Mr. Care mentioned the Bull Ring which was once located just south of the office, and stated that he believed it to be in his possession at the present time; he said he would look for it." Other informants commented about the bull-ring also.

[161] Hopewell Furnace Records: SM12, p. 17b, Jan. 28, 1825; "to John Hoffman for 3 days butchering Pork $3.00 for $4^1/_2$ days salting & cutting @.50 $2.25." SM59, p.18b, Feb. 23, 1827; "to Samuel Guiles for 7 days butchering @.50 $3.50." SM14, p. 23b, May 26, 1828; "to Thomas Wynn for $6^1/_4$ day butchering, cutting up meat & salting $6.25." SM14, p. 54, March 25, 1829; "to Thomas Wynn for $6^1/_2$ days butchering & $13^1/_2$ days mowing @$^3/_9$ $10.00." SM14, p. 99b, June 1, 1830; "to James Roberts 1 day butchering beevs last fall .50 to Wm Lessig $2^1/_2$ days butchering beevs last fall $1.25." SM21, p. 12b, Jan. 21, 1832; "Wm Lessig for 1 day

times people from outside the Hopewell community may have also been paid for butchering.[162] Women were involved with the cutting and preparing of meat also and, in fact, it was one of the relatively few instances that women's names appeared in the Furnace records to receive pay for work that they had done.[163] The process of butchering, cutting, preparing and smoking meat is actually somewhat complex and very labor intensive. For an excellent source of detailed information describing the process and equipment involved one should refer to Amos Long Jr.'s book The Pennsylvania German Family Farm.[164] Clearly, the preparation of a large quantity of meat involved enough work to keep several people busy all day. Hopewell, at times, was involved in massive butchering production. One particularly noteworthy instance was in 1832 when, in November, there were "7 beevs killed at one time"[165] and, in December, "7 hogs killed at one time."[166] Fires would be made, and kettles of various sizes put to use, tables

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butchering .75."

[162] Hopewell Furnace Record SM17 p. 12b, May 9, 1832; "Furnace paid Hatfield for cutting pigs and lambs .91"

[163] Hopewell Furnace Records: Sm31 p. 81b, Jan. 25, 1849; "By Furnace paid Elizabeth Kephart for 14 days work butchering, rendering lard, cleaning house etc. $3.50." SM31 p. 89b, March 31, 1849; "By Furnace paid Sarah Butter for 8 days work boiling soap, butchering etc. @.25 $2.00." SM31 p. 112b, Jan. 30, 1850; "By Furnace paid S. Witman's wife for helping butcher .38"

[164] Amos Long Jr., The Pennsylvania German Family Farm (Breinigsville, Pennsylvania: The Pennsylvania German Society, 1972)

[165] Hopewell Furnace Records SM20, p. 170, Nov. 22, 1832.

[166] Hopewell Furnace Record SM20, p. 190, Dec. 28, 1832.

would be set up for cutting and preparing the meat. Harker Long remembered that a plank cutting table was in the west side of the smokehouse.[167] Meat had to be prepared differently if it were to be smoked, or if to be wet-cured in brine, or if dry cured in a tight box with salt, sugar and saltpeter. In 1832, in apparent preparation for the butchering, Hopewell bought a keg of saltpetre.[168] The fatty skin would be cut up and fried to remove the fat in preparation to make lard. Later the lard could be used in cooking and soap making.

Additional activities besides the cutting and preparation of meats could have taken place at the springhouse such as washing laundry, cleaning milk pans, and making butter. Once again, one should refer to Amos Long's book for details on how these activities are done and what equipment is necessary for each task. Wood was stacked nearby for the springhouse fireplace, as well as for the bake ovens. Sally Boone (b. in Hopewell 1854) told that " ...the wood pile [was] located at the south side of the more easterly of the two large sycamores beside the rear court of the Big House." She also recalled that, in addition to baking, the bake ovens were used to dry fruits and vegetables such as apples and corn.[169]

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[167] Harker Long, Verbatim Notes taken by Roy E. Appleman. Dec., 1935.

[168] Hopewell Furnace Record SM21 p. 40b, Oct. 2, 1832; "for a keg saltpetre $4.51"

[169] Interview with Mrs. Sally Boone and her son David, (taken by Motz, March 22, 1941), p. 3.

BATH HOUSE

The "Bath House" presently lacks sufficient documentation for accurate interpretation. Currently, all knowledge of the structure is restricted to three, somewhat ambiguous and conflicting, references. One 1832 Furnace record shows payments for work done at the "bath house", but no location or description is offered.[170] Nathan Care recalled a "small wash house"[171] and Sally Boone remembered running water and "catch basin"[172] with no mention of a building at all. None of the other oral histories describe this structure and no archeological record has yet been uncovered. Perhaps, sometime in the future, conclusive evidence will be found.

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[170] Hopewell Furnace Record SM21 p. 35a, June 9, 1832; "Furnace Dr. to Alexander McCarraher- for putting in 2 Furnace Hearths & 2 half charges in 1831 & 1832 $100.00- $4^{1}/_{4}$ days mason work on Bath house @.75 $3.00"

[171] Historical Accounts- Care Family. Care, Nathan and Violet (1941) "In times gone by, as one mounted the steps leading up out of the sunken court at the back of the Big House, and turned into the path which led from the east side of the court to the toilet across the head race, one passed a small wash house which stood on the south side of the path and very near the retaining wall of the court."

[172] Interview with Mrs. Sally Boone and her son David, taken by Motz, March 22,1941. "Harking back to her girlhood years Mrs. Boone spoke of...the running water and catch basin where a workman could wash his hands which was located on the right at the top of the steps leading up out of the east side of the court at the back of the big house;"

BIG HOUSE GROUNDS PERIMETER FENCE

A very important feature of the Big House Garden was the wall and fence which at one time enclosed it. The stone wall which marked the western perimeter was completely obliterated when, in 1932, the road was straightened and "stabilized by blacktopping."[173] In the mid 1950's the blacktop road was removed and the road was realigned to approximate its nineteenth century location. It seems that there would be little chance that much archeological evidence of the western perimeter wall survives today, however, early photographs do show the location of the wall. In addition to the photographs,[174] the oral histories provide some information about the garden walls. Mr. Hunter Care (born in tenant house 1 in 1872) gave the following description of the stone portion of the Big House perimeter fence: "There was a stone wall extending from a point where the east head race ends all the way to St. Peters Road, just as the wall now extending from the [blacktop] road [that has been removed] to the southwest corner of the Big House; these two walls in fact were continuous except that the former one was higher."[175] During the nineteenth century the wall would have been essential to define

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[173] Apple, p. II:35.

[174] Useful views of the Big House grounds can be seen in the following photographs: 101.01 Bull 1890; 101.02 Bull 1890; 101.04 Bull 1890; Smith #22-8; 157-37 Appleman 1935; P1935-53 "Garden, Mansion from north." See the annotated list of photographs appended to this report.

[175] Historical Accounts- Care Family. Care, Hunter (1948), p. 2.

the boundary between the refined dwelling house and garden area and the rustic industrial landscape. According to the photographs and the oral histories, both the stone walls to the southern and western sides of the Big House grounds were at one time topped by a fence. The northern perimeter was defined by a fence that apparently did not have a substantial stone wall base like the south and west walls did. None of the informants indicated that the northern section of fence had a stone foundation. Some loose stones were piled along the northern fence line but did not appear to be part of a wall. These stones were likely pulled from the garden and piled under the fence.[176] It is unknown how far east the north fence extended, or if it joined with another fence to form an eastern boundary.[177] The information regarding the type of fence which surrounded the mansion grounds is somewhat ambiguous. This is due partially to the fact that at least some of the fencing was replaced, probably during the period of the Clingen family's occupation of the house. Harker Long remembered a white washed picket fence surrounding the grounds. "It is evident from Long's testimony and from the 1890 photograph that the picket fence was

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[176] John Cotter, "Archeological Tests, Hopewell Village National Historic Site: (1) Garden Area of Ironmaster's House, (2) Parking Lot Extension, (3) Entrance to charcoal House." (July, 1958). Apple, p. II:35.

[177] Presently the only information which may relate to the eastern fence is found in the rather cryptic notes taken from a c.1953 interview with Charles Sheriden Painter (b. 1893); "...2 fences, one s[outh] of greenhouse and back to sort of into Spring House..." Historical Accounts- Painter Family. Painter, Charles Sheridan (1953), p. 1.

whitewashed.(Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936; Bull Collection Photograph, Neg. 101-1, op. cit.)"[178] Harker Long came to Hopewell in 1867, and the 1890 Bull photograph also indicates that a picket fence was there at that time; therefore, there is reasonable evidence to support the assumption that a picket fence was present on the grounds within the Big House period of interpretation. Sally Boone reported that she remembered "...the 2 foot high, cast iron fence which topped the masonry retaining wall in front of the Big House."[179] Sally Boone was born at Hopewell in 1854 and she may recall a fence type that was in place before Harker Long came to Hopewell. In addition to the gates across from the office-store and adjacent to the icehouse, the oral histories record that a gate was located in the westerly wall. "This gate was located just south of the intersection of the southerly garden retaining wall and the western edge of the garden. ...While a photograph taken in 1890 shows post-furnace conditions, additional evidence from interviews indicate that this was the condition of this section of fence after the 1860's. (Bull Collection Photograph, Neg. No. 101-4, see Appendix (also Illustration 8, Apple, Public Roads); Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936, p. 13; Mrs. Nathan (violet) Care, interview by Gale, Feb. 13, 1941; Mr. and Mrs. Sheridan Care, interview by Gale, Feb. 24,1941;

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[178] Apple, II:35.

[179] Interview with Mrs. Sally Boone and her son David, (taken by Motz, March 22, 1941), p. 3.

Hunter Care, interview by Kurjack, Mar. 14, 1948.)[180]

GARDEN TERRACES

The Big House grounds were divided into at least three levels by terraces. Much of the terrace walls had been removed by CCC workers. "Mr. Lucas, here since 1932, remembers hauling away from locations downhill from both probable wall locations, considerable quantity of loose stone."[181] In 1958 archeologist John Cotter was able to verify the existence of the terrace walls. He excavated the traces of retaining walls along the top (north) terrace and also the middle terrace.[182] Today the location of the terraces are marked only by low sloping embankments in the lawn.

BIG HOUSE GARDEN PATHS AND BRIDGES

The paths and bridges in the Big House garden have been identified on Hopewell Furnace Drawing Number NHS-HV-3007[183] which

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[180] Apple, p. II:33.

[181] Apple, p. II:30.

[182] John Cotter, "Archeology, Garden" (April, 1958)

[183] "Historical Base Map - Village Area 1830-1840, Part of the Master Plan, Hopewell Village National Historic Site" (June 31,1956) NHS-HV-3007. Please be aware that although this map provides a useful view of the grounds at the Ironmaster's house, there are a number of inaccuracies and highly conjectural items depicted in the Furnace and village area.

can be used in conjunction with the more recent findings of John Cotter's excavations in the garden area.[184] "The path system shown on Drawing Number NHS-HV-3007 is based on on-the-ground traces, on information from Long and inferred from the drawing of the garden made by Mrs. Mary Krewson, whose drawing does not in several aspects match known physical relationships. (Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936, p. 13 and map; Garden Map, NHS-HV-3001.)"[185] Dr. Cotter's excavation uncovered a stone path which ran on the north side of, and parallel to, the east headrace. No evidence of a walk was found leading to the icehouse-pavilion, which suggests that the terraces had grass plats between the terrace steps. The Furnace records indicate that the garden steps were installed in 1833.[186] The steps originally had eleven inch risers but in 1961 they were cut to seven inches.[187] Mrs. Krewson indicated the walk to the icehouse-pavilion was bordered with box wood.[188] Cotter also

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[184] John Cotter, "Archeology, Garden" (April, 1958).

[185] Apple, p. II:36.

[186] Hopewell Furnace Record SM21 p. 72b, June 6, 1833. "Furnace Dr. to Alexdr. McCarraher...for $20^{1}/_{2}$ days mason work done at the garden steps &c. from the 12th of Oct. to the 1st of Dec. 1832 @$62^{1}/_{2}$- $12.81...''23 days mason work done at the stone fence from the 12th of Mar. to the 12th of April last--@.75cts. $17.25"

[187] Earl Heydinger, "Garden Data" Notes on garden walk and steps. (1961).

[188] Hopewell Furnace Drawing NHS-HV-3001, it should be noted that Mrs. Krewson had drawn the garden with the road in the 1932 position, she was interviewed June 29, 1941 and apparently had not recognized that the road had been moved. At least she did not try to compensate for the new road position if she had

excavated a 19 foot long pebble path between the north porch of the Big House and the east headrace.[189] Robert Buist's The American Flower Garden Directory gives instructions for "Grass Plats and Walks" as well as for "Gravel Walks."

> GRASS PLATS AND WALKS
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> Rake and sweep off from these all litter and worm-cast earth, and give an occasional rolling to settle the ground, and render the surface smooth, where the scythe is to be used. The grass will likewise grow better by rolling it where the frost has partially thrown it out, and add greatly to its beauty. Cut the edgings with an edging iron or spade, so that the whole will have a finished appearance. If any new turf is required to be laid down, [March] is a good time to do it, before vegetation is strong; as the turf that is now laid will have taken root before the dry season commences. Where a great extent is to be done, sowing may be adopted; but it will not have the effect of turf under three years, and during that time must be carefully cut, after the first season, every three weeks, while growing, nor must it be too frequently walked upon. White clover and true perennial rye-grass are the seeds most popular for sowing. The ground must, in the first place, be all equally made up, and levelled with the spade and rake; not 'cart loads of soil laid down and leveled,' which would finally become very uneven, and would need to be lifted and relaid next year. The best turf is that of a close-growing pasture or common, free from all kinds of weeds or strong roots, and the grass short. To cut it expeditiously, be provided with a turfing-iron; but if that cannot be conveniently had, a spade may do very well. Strain a line tight, cutting from one and a half to two feet; then cut them with a spade, about one and a half inch thick. In laying, join them close and alternately: when done, beat them firm with a level wooden beater, and roll

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noticed.

[189] John Cotter, "Archeology, Garden" (April, 1958).

with a heavy roller.

Grass walks, in the last century, were very popular; but time having put them to the test, they are found unfit for walking upon or using in any manner, almost for on half the year; therefore not answering the purposes intended. They require great attention to keep them in order; and if not always neat and clean, they are a disagreeable object in a garden; but when well dressed, there effect is very enlivening. When they are desired, prepare the ground as above directed; making the walk a little higher than the adjoining borders, to prevent the earth from being washed on it by the rain. Allowing the walks to be six feet wide, make the centre five inches higher than the sides, or about seven-eights of an inch to the foot whatever the breadth may be, which will form a gentle declivity to throw off rain. When laid, beat and roll it well; cutting the edge neat and even. Water frequently if the weather sets in dry. To keep grass walks or plats in order, they should be mown once every three or four weeks from May to September, and the grass each time swept clean off. When the grass is allowed to get long before being cut, the roots become tender; and die when exposed to the sun; at last the grass is all in spots, and in another year requires to be relaid.

GRAVEL WALKS

A practice once existed of turning these into heaps or ridges during winter to destroy weds, &c. But this has almost been given up as unnecessary, unsightly, inconvenient, and not doing any material service.

Where the surface of these has become foul, irregular, or mossy, they had better be turned over four or five inches deep where the gravel will admit of it; but if not, hoe and rake them perfectly clean, give a new coat of gravel, and pick up any stones that you think are too large; then give them a good rolling, applying it frequently after showers of rain. When they are well attended to just now [in March], they will look well all season; but if neglected, they take more labour, and are never in such good condition.

Fancy edgings of Thyme, Thrift, Gentiana, Lavender, and Violets- (Daisies may be used if the situation is shaded.) The

> whole of these may be planted by the line with the dibber except Thyme, which lay as directed for Box. See this month under that head. Any time in this or the beginning of next month [April] will answer to make edgings of these; and if dry weather occurs before they begin to grow after planting, they must have frequent waterings until they have taken root. Thyme requires to be dressed twice during the season to keep it in order.[190]

An interesting observation is that an old photograph of the blacksmith shop shows leaning against one wall a stone roller of the type that could have been used to maintain lawns and gravel walks.[191]

BIG HOUSE FLOWER GARDEN

It is doubtful that the exact garden design and plantings at the Ironmaster's house will ever be known. However, clues to some of the plantings can be gleaned from the oral histories. Because gardens undergo change more frequently than structures such as fence lines and walkways, the oral histories become less accurate, many informants will have been too young to remember specific details of the gardens of 1860 to 1870. However, their information regarding the types of perennial plants and shrubs found in the garden can be very useful. In addition, publications that are contemporary to the period of

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[190] Robert Buist, The American Flower-Garden Directory (Philadelphia: Carey and Hart, 1841), pp. 58-60.

[191] A copy of the photo was seen in "Appleman Reports Which 'Created Hopewell'"(1935).

interpretation can provide insights into what may have been done in the garden.[192] Long, comprehensive lists of popular and striking flowers with commentary on their colors and needs were published in many of the period garden books and can be used to aid in the interpretation of the Big House grounds. A compilation of the plants which had been mentioned in the oral histories are: flowers- bleeding heart, blue bells, crocus, daffodils, day lilies, fox glove, hyacinths, lilies, poppies, trumpet vine and ivy; shrubs- boxwood, bridal wreath, lilac, orange blossom, paradise bush, peonies, rose of sharon, snowball bush; roses- yellow roses, pink rambler, red rambler. Also mentioned were: mignonette, rosemary, sage, thyme, as well as asparagus, grapes, raspberries, and strawberries. Some plants which have been identified as still remaining at the Big House are: crocus (front of Big House), blue bells (near steps),

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[192] In addition to Robert Buist's American Flower Garden Directory other works offered for sale in the 1841 edition by Carey and Hart in Philadelphia are: J.C. Loudon's Encyclopaedia of Plants, Loudon's Encyclopaedia of Agriculture, Loudon's An Encyclopaedia of Gardening, Loudon's Hortus Britannicus, Loudon's Arboretum et Fruticetum Britannicum; or the Trees and Shrubs of Great Britain, Native and Foreign, Loudon's The Suburban Gardener and Villa Companion, David Low's Elements of Practical Agriculture, Sir H. Davy's Elements of Agricultural Chemistry, James Forbes Hortus Woburnensis. The Flower and Fruit Gardens, Pleasure Grounds, &c., &c. At Woburn Abbey, Houlditch and Sinclair's Sinclair's Hortus Gramineus Woburnensis, John Morton's On the Nature and Property of Soils, Roger's Fruit Cultivator, C. M'Intosh's The Green-house, Hot-House, and Stove, The Flower Garden, Paxton's Practical Treatise on the Cultivation of the Dahlia, Patrick Neill The Fruit, Flower, and Kitchen Garden, J.B. Papworth's Hints on Ornamental Gardening, The Queen of Flowers; or, The History of the Rose, Mrs. Loudon's The Ladies' Companion to the Flower Garden. Other books on horticulture and botany were also listed as available from Carey and Hart.

daffodils, periwinkle, grape hyacinth, lilies, rose of sharon, lilacs, snowball bush, spirea.[193] Mrs. Krewson had indicated that in addition to the boxwoods which bordered the walk up to the icehouse-pavilion, another broad boxwood walk with flowers extended from the pavilion eastward behind the hot-house. One can imagine the beautiful vista this arrangement must have provided for anyone sitting in the pavilion.[194] Samuel Freese, who was born at Hopewell in 1872 and left in 1879, told that "...there were many pavilions, seats and benches in the gardens, and lots of flowers."[195] When Mr. Freese referred to "many pavilions" he was probably also including some of the arbors or trellises. Mrs. Krewson had indicated that the walk up to the icehouse-pavilion was flanked by "rustic seats covered by arbors."[196] Violet Care recalled that bridal wreath was planted along the lower, or south side, of the race.[197] That location for the bridal wreath (spirea) could have screened the unpicturesque vegetable garden from the view from the front porch of the Big

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[193] Robert's "Garden Report" (n.d.).

[194] Garden Data, "Map of Big House Gardens" Source: letter from Mr. Garrison June 29, 1941 dealing with an interview with H.H. Huston and Mrs. Krewson, both former residents of the Hopewell locale. Transcribed by Gebhard.

[195] Historical Accounts- F-G. Freese, Samuel Wesley (1959).

[196] Apple, p. II:37.

[197] Historical Accounts- Care Family: Care, Violet (Mrs. Daniel) 1941.

House.[198] Because the Big House grounds are terraced and there is evidence that there were parallel boxwood borders[199] it appears that the grounds were well adapted for an Italianate style with flower parterres. Buist wrote in the American Flower Garden Directory: "The Italian style is characterized by broad terraces and parallel walks, having the delightful shade and agreeable fragrance of the orange and the myrtle. The terraces may be advantageously adopted to surmount steep declivities; and, if judiciously laid out, would convert a steril bank into a beautiful promenade or choice flower garden."[200]

BIG HOUSE VEGETABLE GARDENS

There was a vegetable garden located at the far western end of the Big House grounds. The vegetable garden was probably positioned at the western extent of the garden because it is the farthest point from the mansion house and the closest point to the industrial area. In other words, the flower gardens were given the prominent locations surrounding the Big House, and the

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[198] While a vegetable garden may have been considered unsightly, remember that the industrial landscape was not seen as objectionable to nineteenth century sensibilities. In fact, the mansions of industrialists were often carefully sited to provide a vista overlooking the industrial works.

[199] When the United States Government purchased the Hopewell lands from A. Louise Brooke in 1935, permission was given to the former owner to remove the boxwood. That is why there are no boxwood walks on the grounds today.

[200] Robert Buist, The American Flower Garden Directory (Philadelphia: Carey and Hart, 1841), p. 9.

vegetable garden was placed in a less aesthetically pleasing location near the charcoal shed. Charles S. Care (born in Hopewell in 1866) and his wife Clara (born in Pine Swamp in 1867) both resided in Hopewell after they were married. In their interview they described the vegetable garden, "Between this walk [up to the icehouse-summerhouse] and the road [past the charcoal shed] existed an excellent vegetable garden. A stone wall extended from the road or driveway to the mansion house to a point above the summer house and thus separated the garden from the other ground around the 'stock' (charcoal) house."[201] Hunter Care concurred that "The relatively flat area just north of the east head race, extending from the stone wall to a point north of the Big House, was used as a vegetable and a flower garden."[202] Harker Long recalled a "Fine garden. Large asparagus bed. Large strawberry bed, and also a nice raspberry bed..."[203] The vegetable garden was not the large kitchen garden needed to supply the moulder's kitchen, asparagus and raspberries would not have been part of the typical worker's dinner, but would have been intended for the Ironmaster's family and guests as well as for clients who stayed at the mansion. The main garden for

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[201] Historical Accounts- Care Family: Care, Charles Sheridan (1941), p. 2.

[202] Historical Accounts- Care Family: Care, Hunter (1948), p. 2.

[203] Historical Accounts- K-L: Kemper, Jackson (1936), p. 1. Although cataloged and filed as Kemper, the interview is with Harker Long, Mr. Kemper was the historian who conducted the interview and wrote up the transcript.

providing the moulder's kitchen and regular kitchen staples for the Big House was located elsewhere.

Harker Long remembered the larger kitchen vegetable garden located near the southeast corner of the barn. "Harker Long indicated that a vegetable garden of approximately one-quarter of an acre existed in this area. [see Base Map NHS-HV-3007] It may have been slightly more to the east. He said that the garden was almost square, but slightly longer north and south. Its west side joined the barnyard. Access to the garden was a plank over the tail race. A picket fence surrounded the garden. He indicated that the garden contained "pole beans, cabbage, late potatoes, etc." The fence was whitewashed. Long said that the garden was all northwest of French Creek, and that the creek now (1935) cut through the garden area. (Long, Verbatim Notes 1935; Appleman, Restoration Plan 1936, p. 13, and Photo 37.)"[204] The creek bed has been moved several times since 1935.

Some vegetables were purchased from Hopewell tenants and some were brought from the surrounding Hopewell Furnace farms. The farm leases often specified what was to be grown and how much of the crop was to be reserved for Hopewell. An undated paper fragment which past Hopewell historians have estimated to date from 1848 or earlier contained a list of seeds: "Tomato seed, Early York Cabbage seed, (illegible) Cabbage seed, Early lettuce seed, Large (illegible) seed, Early red-beet seed, Oyster plant

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[204] Apple, p. II:58.

seed, Egg plant seed, Early Radish seed. cert (?) 65 cts."[205] A complete list of garden seeds sold by John Grace of West Chester in 1838 has been reproduced in the Tenant House Gardens section of this report.

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[205] Hopewell Historians Research Files: Garden, Garden Seed (1848?) Transcription from "Fragments of Papers, etc." I have not seen the original paper fragment and do not know on what grounds the 1848 date has been based. It is of interest primarily because these seeds have been directly associated with Hopewell as part of the Hopewell Furnace papers.

APPENDICES

The following excerpts of activities have been taken from the diary of a Southeastern Pennsylvania farmer, 1831-1834. I have rearranged the quoted materials in order to display his activities by month and then year. The original diary can be found at the West Chester Historical Society filed as "Diaries 1831-1834, VAULT. Farmer's diary, writer unknown, giving account of farm work and of the weather."

JANUARY 1831
[missing]

JANUARY 1832

Roads in fine order for sleighing.
4th Butchered our pork for house use.
6th Rain took away the snow.
7th Finished cleaning the last of our oats and hauled a parcel of corn in the barn P.M. fair weather, quite moderate.
9th Started to Philadª market.
14th Took a load of corn to Herford's and one to Whitson's mill. Moderate weather, frost out of ground.
16th Drawed in a stack of wheat.
19th Began to tread out the stack of wheat.
27th Finished treading wheat.
28th Cleaning wheat.

JANUARY 1833

3,4,5. [unusually warm] The frost came out of the ground and some of our neighbors were ploughing the last three days of the week.
5. Drawed in a stack of wheat that grew in the lime kiln field.
7. Began to head at the stack we drawed in last week.
16. Finished treading wheat.
18. Finished treading wheat.
19. Took a load of wheat to Herford's to be ground for home use.
21 & 22. Treading oats.
26. Cleaning oats.
29. Butchering and make preparations to go to market.
30. Started to Philadelphia.

JANUARY 1834

3d & 4th. Very cold- treaded wheat.
10. Snowed slowly all day hauling logs for Baughmann.
11. Treading wheat at intervals through the wk.
13. Cleaning wheat.
14, 15. Hauling logs for Baughmann.
16. Began to tread wheat again.
20. The frost is nearly all out of the ground and the roads are extremely bad.
22. Took a pair of small fat oxen to the gap.
23. Finished treading wheat.
25. Drawed the oats into the barn that were put in the hay house.
26. Treading oats the most of this week.

FEBRUARY 1831
[missing]

FEBRUARY 1832

[Ice storm]
9th In the afternoon the limbs began to break from the trees in the woods and continued almost incessantly in one direction or another to fall with tremendous crashes for 24 hrs.
10. Had the limbs chopped up this wk. which had been broken from the trees by the sleet.
26th Sowed our clover seed about the middle of the week.

FEBRUARY 1833

18th Finished cleaning the last of our oats.
20. Took a cart load of potatoes to Slymaker's Tavern.

FEBRUARY 1834

1st Cleaning oats. Had J. Baughman putting a new roof on the granary the 2 last days of this week.
2nd Treading oats most of this week.
9th Cloudy, misty, and smoky.
10. Cleared off A.M.- finished treading oats P.M.
11. Cleaning oats.
14. Taking up rocks and hauling them off a field for corn. [mild]
18. Began to plow corn ground.
19. Arched, and part filled the kiln at Clendenon's.
20. Very pleasant- sowed our clover seed.
22. Had the stones heaped on all of our mowing ground in course of the week. Had considerable [?] of ploughing done in the course of this week and a few more large white oak trees fell for Baughman.

MARCH 1831
[missing]

MARCH 1832

5th Began to plow corn ground P.M. ploughing corn ground through the week.
17th Had a parcel of old wood cut on our wood lot this wk. and some of the stones heaped on a field intended for mowing.
27th Began to plough ground for oats. Had the stones drawed off

on the mowing ground about the middle of the wk.
31st Drawing rails from the wood lot.

MARCH 1833

3rd [Very cold] The Sleighing was very good.
8th Snow melted in roads so as to spoil the good sleighing.
15. Began to plough the field back of the orchard for corn. Sowed clover seed on the lime kiln field.
16. Quite pleasant- sowed another field with clover seed.
17. Ploughing at our corn ground all this week.
27. Finished ploughing our corn ground.
28. Began to plow ground for oats.

MARCH 1834

2d Had some ploughing done and some logs hauled for Baughman in the course of the wk.
10 & 11. Sowed the clover seed at Clendenon's.
15. Finished plowing corn ground.
18. Took a mill shaft to J. Smedley in Little Britain.
22. Began to plough for oats.
24. A fine day- Removed to the Clendenon place.
25. Made a beginning to plow oat ground. Ploughing, heaping and hauling off stones the most part of this wk.

APRIL 1831
[missing]

APRIL 1832

6th & 7th Sowed oats.
9th Rolled a field for mowing and took over plaster to Agnew's mill and had it ground.
10th Planted half an acre with potatoes.
11 & 12th Sowed plaster on mowing ground.
13 & 14. Harrowed one of our fields for corn both ways.
14. Drawed a parcel of corn in the barn.
18. Started to Columbia for a load of boards. Had a considerable quantity of corn thrashed off this wk. and took to Herford's.
26. Began to plant corn.
28. Finished planting one of our fields with corn and also planted our potatoes.

APRIL 1833

4th Sowed field with oats.

8. Finished ploughing oat ground.
10. Sowed another field with oats. Heaped, and drawed the stones off a field for mowing the later part of this week.
15 & 16. At Lancaster with a load of potatoes.
17 & 18. Brought our plaster from the mill- P.M.
20. Sowed our plaster.
22. Planted our potatoes.
23 & 24. Harrowing the corn ground.
27. Began to plant corn.
30. Finished planting corn.

APRIL 1834

1st Planting peach trees, P.M.
5. Ploughing oat ground all the wk.
[rain]
11. Clear- began to sow oats.
13. The fruit trees are coming in blossom much earlier this spring than common.
19. Sowing oats, ploughing corn ground etc. this week.

MAY 1831
[missing]

MAY 1832

1. Drawing rails from the lot.
3d Planted our other field with corn.
5th Took a load of potatoes to S. Sellars and barked some trees.
9th Cutting off and drawing saw logs.
10, 11, 12th Cutting rail timber and taking off bark on the wood lot.
14. Took 2 loads of wheat to Whitson's mill.
15. Took another load of wheat to Whitson's.
16. Fencing a part of our chestnut lot where the timber had been cut off.
18. Planting pumpkin seeds and took a load of oats to Sherts's.
19. Took Sherts another load of oats.
22. Began to hoe- harrow corn.
25- 26. Planting pumpkin seeds.
26. Took a load of bark to Sirvill's [?] A.M.
27. Took all of our bark to Sirvill's [?] this wk. except the load taken previous.
30th Had the barked timber and chestnut tops on the wood lot cut up this wk.

MAY 1833

2nd Started to Wilming[ton] with a load of corn. [dry]
6th Sheared the sheep, P.M.
8th Sent a 2nd load of corn to Wilmington.
9 & 10. Shelling corn with a corn sheller. [rain]
13. Sent a 3rd load of corn to Wilmington.
20. [Heavy rain washed out places in the corn fields.]
21. Sent a 4th load corn to Wilmington.
24. Planting pumpkin seeds.
27. Took a load of bark to Linvill's.
28. Had the team ploughing on the roads.
30 & 31. Drawing kiln wood from our chestnut lot.

MAY 1834
[missing]

JUNE 1831
[missing]

JUNE 1832

6th Drawing timber from the wood lot to be put in the hay house which we have commenced building.
7th Plastered our corn.
13th Had a hay house raised, P.M.
22nd Began to mow.
24th The ground has become very dry and rain is much wanted. Making hay all the wk.

JUNE 1833

1st Began to harrow our corn.
3. Drawing wood to the lime kiln from the chestnut lot.
6. Finished harrowing the corn the first time in the morning.
8. Drawing home old wood from our lot.
13, 14, & 15. Drawing wheat, corn, and oats to James Street's.
15. Cut our winter barley.
17. Took in our barley.
20. Freshet swept away a good deal of fence.
21. Began to mow.
23. Freshet in the creeks- taking away the fence in some places.

JUNE 1834
[missing]

JULY 1831
[missing]

JULY 1832

4th Finished getting in our hay. Worked all of our corn over this week. [dry]
10. Began to cut wheat.
15. Clear and dry weather all wk. all vegetation is languishing for want of rain.
Got in all of our grain and thrashed the rakings and cleaned them on the 7th day.
26th Began to cut oats.
29. Thunder shower seemed to revive the corn a little.

JULY 1833

4. Took in the last of our hay and cutting wheat- fine weather for harvest the week out.
10. Got all our wheat in except one load.
11. Treading rakings.
12. Finished farming our corn.
13. Excessively warm- took in our last load of grain and finished treading rakings.
15. Cleaning the gleaned wheat A.M. and began to head out our barley P.M.
20. Finished cleaning the barley.
22. Drawing limestone and arching the kiln A.M. drawing saw logs P.M.
23. The heat is extreme- pulled the flax A.M. and began to cut oats P.M.
24. Working in the quarry.
25. Quarrying P.M.
28. Pleasant- working at our oats all of this week.

JULY 1834
[missing]

AUGUST 1831
[missing]

AUGUST 1832

1st Finished our oats.
2nd Began to draw out dung.
3rd Began to plow oat stubbles.
4th [showers]

5th Showers... which wetted stubble ground sufficiently for plowing well, and started the grass to growing again pretty handsome. Drawing out manure all of this wk. and ploughing oat stubble.
12. Drawing out manure and ploughing the first 3 days of the wk.
17th Drawing sand into the barn yard, P.M.
23rd Finished drawing out our manure, A.M.
24. Putting the Quarry in order to take out a kiln of stone- began to plough the lime kiln field P.M. it being under wheat stubble.
26. Quarry limestone all of the week.

AUGUST 1833

3rd Got all our oats in today except one load, which had to be left out in consequence of the shower.
8. Tread out our oat rakings.
9 & 10. Mowed a field that had been pastured in the fore part of the season.
12. Drawing hay and stacked it.
13. Began to draw dung on the oat stubbles.
17. Finished hauling and spreading manure on one field of oat stubble.
19. Began to mow another field of 2nd crop grass.
23. Began to draw more manure on the 2nd field of oat stubble. Ploughing all of this week.
27. Finished drawing out dung A.M. and filled the lime kiln P.M.
30. Made some cider.
31. Finished ploughing oat stubbles.

AUGUST 1834
[missing]

SEPTEMBER 1831

1st day made some cider.
4th Mowed 2nd crop of clover. Stacked it up during week.
13th Began to cut corn.
14th Took 2nd cart load of potatoes to Sellars.
16th [Sp?]reading seed wheat.
19th Made the last of our cider.
21st Began to plow wheat ground 2nd time.
22 Finished [torn] corn.
[date torn] Threshing off clover seed.
[no date] Finished ploughing our wheat ground.

SEPTEMBER 1832

1st Finished ploughing the lime kiln field.
3rd Went to Strasburg for a parcel of furniture.
5th Began to tread seed wheat P.M. out of a barrach, and kept at it the wk. out. Sowed the lower part of the lime kiln field with rye the latter part of the week.
9th Treading wheat the fore part of the week, and finished the barrach on the 7th day.
11th Brought some seed barley from J. Conard's.
15th Sowed the lot with rye at the end of the orchard.
16th [very warm]
17th Bought a lot of steers out of a drove.
Cleaning wheat.
18. Drawing limestone P.M.
19. Had the lime kiln arched and got it filled.
20. Sowed 9 bushels of winter barley in the lime kiln field- Began to plough wheat ground the 2nd time P.M.
21- 22. Had a considerable quantity of small wood drawed home.
25th Began to cut off corn.
26. Finished ploughing wheat ground.
27th Took the clover seed to Baker's mill having but one load.
28- 29. Taking up potatoes.

SEPTEMBER 1833

2nd Drawing out lime.
4. Cradled our seed clover.
6. Made some cider.
10. Brought a load of seed wheat from Wm Kirk's- Bought 10 steers to feed.
13. Sowed our rye.
14. Thrashing off clover seed P.M.
16 & 17. Thrashing off clover seed in the afternoons.
18. Made cider P.M.
19. Began to cut corn.
20. Cutting off corn and thrashing clover seed.
22. Ploughing at our wheat ground the 2nd time the greatest part of the week.
25. Finished cutting off corn A.M. and finished thrashing clover seed P.M.
27. Took up our potatoes.
28. Drawed dung on the potato patch.

SEPTEMBER 1834
[missing]

OCTOBER 1831

2nd Sowed lime kiln field with wheat.
11th Finished sowing our wheat.
[Fields flooded, fences washed away.]
13. Carpenters at work lengthening out our corn crib.
14. Brought cart load of winter apples from M. Miller's.
15. Taking up potatoes.
17. Finished taking up our potatoes.
Began to husk corn and kept at it all week.
23. Fine weather for husking all week.
29. Finished getting in our corn.
30. Hauled our corn fodder this week and thrashed off 72 bushel of new corn and took it to Herford's.

OCTOBER 1832

1st Sowed the field next to Smith's with wheat.
3rd Hard frost.
4. Sowed Wheat on the upper part of the lime kiln field above our winter barley and finished with so doing. Finished taking up the potatoes and sowed the ground with rye in the later part of the week.
Hauled a parcel of wood from the chestnut lot on the course of the week to burn a kiln of lime with.
[rainy weather]
16th Burned a kiln of lime this week.
21st Warm and smokey.
23rd Began to draw out a kiln of lime and put it among shocks of corn.
25. Finished hauling lime A.M., and began to husk corn P.M.
28. Smokey throughout the wk. Husking at our corn all of this week.

OCTOBER 1833

2nd Shelled off a parcel of corn with a shelling machine.
3rd & 4. Sowed all of our wheat.
5. Gathered in some apples and heaped some for cider.
9. Making cider.
10. Finished making cider for this year.
12. Picked a load of winter apples at Trueman Cooper's A.M. rain P.M. freshet took away some fences.
14. Drawing clover seed to Smith's mill P.M.
15. Finished taking our clover seed to the mill A.M.
18 & 19. Treading oats. [rainy]
22. Took a load of oats to the turnpike A.M.
23. Began to husk corn and kept at it the wk. out.
28. Husking corn.
29. Began to tread oats and kept at it nearly all the wk. out.

OCTOBER 1834
[missing]

NOVEMBER 1831

7th Making rails on our chestnut lot and hauling them.
10th Hauling home fire wood latter part of wk.
14th Hauling rails from the chestnut lot.
22nd Very cold and snowed A.M. to P.M.
25 & 26. Drawing dung and spreading it on a clover field.
27. Cold in the extreme for time of year.

NOVEMBER 1832

11th Mo. First day 4th- At corn through the week.
13 & 14. Drawing fodder and husking.
15. Finished husking.
16. Finished drawing our fodder.
17. Drawing rails from the wood lot.
19, 20, 21. Drawing rails from the chestnut lot.
23. Butchered a steer for our own use.
25. Treading wheat all of this week out of the hay-house and finished on the 7th day evening.

NOVEMBER 1833

2nd Took 100 bushel of oats to the turn pike. Had a parcel of flax broke this wk. the fodder being to dry to work at the corn.
6. Husking corn P.M.
7. Finished husking.
8. Hauling fodder.
9. Finished hauling fodder.
13. Finished thrashing our rye and cleaned it in the afternoon.
15. Began to tread wheat P.M. Had the bitter weeds mowed off a wheat stubble field, and drawed into the barn yard in the course of the wk.
18. Treading wheat.
19. Cleaning wheat.
20, 21, & 22. Had a considerable number of large white oak trees fell in our woods for the rail road.
23. Clear and smokey.
29. Took a load of barley to E. Passmore.
30. Took our 2nd and last load of barley to Passmore.

NOVEMBER 1834
[missing]

DECEMBER 1831

Colder than eldest persons memory for so early in the winter.
10th Butchering and making preparations to go to Wilmington Market.
14. snow shoe top deep.
17. Began to head wheat.
19 & 20. Treading wheat.
21st Cleaning wheat.
23. Drawing wheat in the barn- about two inches of snow fell in the night.
First day 25th, treading wheat nearly all the week and finished cleaning it on the 7th day.
28. Snowed all the A.M. and the roads being pretty smooth, it made fine sleighing.

DECEMBER 1832

3d Cleaning wheat.
5. Butchered our largest hogs and salted them.
6. Finished cleaning, and measured up two loads of wheat.
7. Took a load of wheat to McClenand's Mill.
[rain]
10 & 11. Treading oats.
15. Cleaning oats.
19. Drawed in a stack of wheat, began to tread it, and kept at it the week out.
26. Cleaning wheat.
28 & 29. Treading oats.

DECEMBER 1833

2d Began to draw white oak logs for Samuel Baughman.
11. Butchered our hogs.
17. [storm] An immense quantity was blown down and buildings unroofed and otherwise injured in numerous instances... considerable freshet.
20. Hauling logs.
26, 27, 28. Clear and cold- treading oats.
30, 31. Cleaning oats.
31. Took a load of oats to Steele's Mill.

DECEMBER 1834
[missing]

PHOTOGRAPHS

125.01 Stokes 1889 Wheelwright/carpentry shop with furnace in background.

101.03 Bull 1890 Wheelwright/carpentry shop and blacksmith shop.

101.05 Bull 1890 Furnace stack.

101.02 Bull 1890 (oversize file) Big house, picket fence shown.

101.01 Bull 1890 (oversize file) View of Big House from between the office/store and barn.

101.10 Bull 1890 Big House, office/store, barn, and crowd gathered in winter.

101.08 Bull 1890 Big House, office/store, barn, sled loaded with sticks, and crowd gathered in winter.

101.04 Bull 1890 Road bed around Big House garden with picket fence, good wall detail.

NO FILE NUMBER c.1890 S. Wilbert house off Cold Run Road (French Creek State Park) razed c.1938, house similar to HOFU duplex with a picket fence.

101.07 P.1890-6 1895 Bull photo, Cast house and furnace ruin.

47-5 oversize file 1915 Care photo.
Smith #22-8 Southwest corner of Big House grounds, front facade of Big House.
Smith #22-10 oversize file 1922 Big House and office/store.

H6.004 #35-26 1926 Furnace ruin, water wheel and blow tubs.

K.015-19-32 also P1935-65 no.16 (same photo) General view of original Hopewell Furnace lake with house standing in the woods.

P135-27 Appleman 1935 Hopewell lake pre-C.C.C.

157-37 Appleman 1935 Big House garden, ruins of terrace walls, rail fence around ceder pasture appears to be three rail.

P1935-53 "Garden, Mansion from north." Photo of unrestored big house garden.

P1935-28 "Race, tail from furnace bank" Appleman 1935 The photo also shows slag piles being removed from around the blacksmith shop and a possible privy behind the boarding house.

W3.020, 105-7 3/19/35 "Hopewell Village- slag pile" C.C.C. with dump truck at huge "slag borrow pit" no.44.

51-19 J4.004 Appleman 1935 DB 228 Boarding house from southeast, broken pale fence leaning against back wall.

51-13 J4.003 Appleman 1935 DB 207 Boarding house from north, good view of well pump and trough.

95-10 J4.007 Appleman? Boarding house, like tenant house, also has supports for a wooden gutter.

46.001 Photo of pre-restoration blast machinery.

Photo #37-55 Road leading into Hopewell shows the boarding house pump, gully and footbridges at road edge and tenant house.

P1970-106 Roads Similar to photo #37-55 but tenant house 2 is also in the picture.

NO FILE NUMBER (large photo album) Photos of wooden gutter on tenant house 2 also photo showing the out house at the duplex and the grape arbors.

NO FILE NUMBER (brown envelope) Photo showing out house for tenant house 1 at back corner of the cave.

157-16 Kock 5/22-29/39 East head race after restoration with water running, view looking east from west by pass road.

108-17 J6.009 NO DATE (1935-40?) Nathan Care house and barn looking s.w. with a good view of out buildings and the privy.

19-73 J6.001 NO DATE Nathan Care house, privy and outbuildings.

WORKS CITED

A note about the Hopewell Furnace source materials located at Hopewell Furnace National Historic Site.

The historic Furnace ledgers, time books, and journals at Hopewell Furnace National Historic Site are filed by "SM numbers." Each book was assigned an "SM number" although these numbers are not always in chronological order and the books span more than one year. Therefore, in this report one will find that the "SM numbers" are always followed not only by a page number but also the complete date so that the references can be located in the book more easily. The books are available on microfilm for viewing in the Hopewell Furnace National Historic Site library.

Historic letters, business correspondences, and miscellaneous papers are filed as "Documents" followed by a seven digit number. The numbering system is arrived at by the document's year minus one thousand, followed by the month, followed by the day. These are also available on microfilm for viewing in the Hopewell Furnace National Historic Site library.

Most of the oral histories are filed in "Historical Accounts" and are arranged alphabetically by the informants last name. These records are filed in the Hopewell Furnace National Historic Site library.

Abel, Leland. "Privy discussion." ts. Unpublished report, Hopewell Furnace NHS library, Historic Structures file, n.d.

Apple, Russell A. Documentation for the Historical Base Maps, Hopewell Village National Historic Site. Washington: U.S. Dept. of the Interior, National Park Service, 1956.

Berks and Schuylkill Journal 6 Jan. 1838, 12.35.

Berks and Schuylkill Journal 13 Jan. 1838, 12.36.

Berks and Schuylkill Journal 27 Jan. 1838, 12.38.

Berks and Schuylkill Journal 17 March 1838, 12.45.

Berks and Schuylkill Journal 7 April 1838, 12.48.

Buist, Robert. The American Flower Garden Directory: Containing Practical Directions for the Culture of Plants in the Flower Garden, Hot-House, Green-House, Rooms, or Parlor Windows, for Every Month of the Year. Philadelphia: Carey and Hart, 1841.

Buist, Robert. The American Flower-Garden Directory. Philadelphia: A. Hart, late Carey and Hart, 1852.

The Cabinet Cyclopaedia. Conducted by the Rev. Dionysius Lardner, LL.D F.R.S. L.& E. M.R.I.A. F.R.A.S. F.L.S. F.Z.S. Hon.F.C.P.S. &c. &c. Assisted by Eminent Literary and Scientific Men. Useful Arts, a Treatise on the Progressive Improvement and Present State of the Manufactures in Metal. Vol. I, Iron and Steel. London: A.& R. Spottiswoode, 1831.

Carter, Tom. The Victorian Garden. Salem, N.H.: Salem House, 1985.

Cotter, John L. "Archeological Tests, Hopewell Village National Historic Site: (1) Garden Area of Ironmaster's House, (2) Parking Lot Extension, (3) Entrance to Charcoal House." Hopewell Furnace National Historic Site Archives, July 1958.

Division of Publications. National Park Service. Hopewell Furnace: A Guide to Hopewell Furnace National Historic Site, Pennsylvania. Handbook 124. Washington: U.S. Dept. of the Interior, 1983.

Documents Relating to the Manufacture of Iron in Pennsylvania. Philadelphia: Convention of Iron Masters General Committee, 1850.

Elliott, Brent. Victorian Gardens. London: B.T. Batsford Ltd., 1986.

Graff, Elizabeth. "Preliminary Report on the Activities of Class 572, Historical American Archeology at the University of Pennsylvania." ts. Department of American Civilization in the Second Summer Session, 1971.

Hedrick, U.P. A History of Horticulture in America to 1860. New York: Oxford University Press, 1950.

Heydinger, Earl J. "Orientation Report for Archeology in Lower Working Level at Hopewell Village NHS." ts. Unpublished report, 1962. Hopewell Furnace Library.

Jabs, Carolyn. The Heirloom Gardener. San Francisco: Sierra Club Books, 1984.

Kurjack, Dennis C. Hopewell Village National Historical Site. Washington: National Park Service Handbook Series, Hamberg, 1950.

Lapsansky, Emma. "Excavations at Springhouse and Smokehouse, Hopewell Village National Historic Site." Elverson, Pennsylvania: July 10-16 1969.

Lardner, Dionysius. The Cabinet Cyclopaedia... Useful Arts, a Treatise on the Progressive Improvement and Present State of the Manufactures in Metal. Vol. I, Iron and Steel. London: A.& R. Spottiswoode, 1831.

Lewis Miller, Sketches and Chronicles. York, Pennsylvania: York County Historical Society, 1966.

Long, Amos, Jr. The Pennsylvania German Family Farm. Breinigsville, Pennsylvania: The Pennsylvania German Society, 1972.

Mason, M. Theodore, Jr., and Beulah B. Fehr. Brader in Berks, 1880-1883. Ed. Paula M. Flippin. Reading Pennsylvania: The Historical Society of Berks County, Inc., 1986.

M'Mahon, Bernard. The American Gardener's Calendar. Philadelphia: 1806.

Montgomery, Morton L. History of Berks County in Pennsylvania. Philadelphia: Everts, Peck and Richards, 1886.

Motz, J.C.F. "Field Notes, Greenhouse Job No. 646." ts. Unpublished report, Hopewell Furnace NHS library, 1941.

Overman, Frederick. A Treatise on Metallurgy Comprising Mining, and General and Particular Metallurgical Operations With a Description of Charcoal, Coke, and Anthracite Furnaces, Blast Machines, Forge Hammers, Rolling Mills, etc.. New York: D. Appleton & Company, 1852.

Rupp, I. Daniel. History of The Counties of Berks and Lebanon. Lancaster: G. Hills, 1844.

Schumacher, Paul J. F. "Archeological Field Notes; Historic Road Project Archeology." ts. Unpublished report, 1955. Hopewell Furnace Library.

Seidel, Ellen. "Archaeological Monitoring in Historic Structures Report, Ironmaster's House, Structure 1." Unpublished Report, Hopewell Furnace N.H.S., 1980.

Society for the Diffusion of Useful Knowledge. Manufacture of Iron, reprinted from the Library of useful Knowledge. Philadelphia: Orrin Rogers, 1837.

Stone, Garry Wheeler. "Archaeological Tests at Tenant House No. One And Environs." ts. Unpublished report. Hopewell Village National Historic Site, 1968.

Stone, Garry Wheeler. "Archaeological Tests at Tenant House No. One and Environs, Supplement, Historic Photographs of Tenant House Area." ts. Unpublished report, 1970. Hopewell Furnace Library.

Village Record and General Advertiser. [West Chester, PA] 13 March 1838, XXI.1075.

Walker, Joseph E. Hopewell Village: A Social and Economic History of an Iron-Making Community. Philadelphia: University of Pennsylvania Press, 1966.