Oxford Dendrochronology Laboratory
Report 2009/05

The Tree-Ring Dating of Eight Virginia Slave Buildings

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Summary:

A total of twelve phases of construction from eight buildings were sampled and dated as part of a multidisciplinary research project into the survival of pre-Civil War slave cabins. The project was funded by a grant from the National Endowment for the Humanities and was managed through the Department of Historic Preservation at the University of Mary Washington and the Mount Vernon Ladies' Association. The tree-ring dates ranged from 1785 to 1858, although the earliest of these are reused timbers.

FOUR SQUARE PLANTATION, Isle of Wight Co; Slave Quarters
- (a) South (right-hand) cabin — *Felling dates:* **Winter 1788/9**
- (b) North (left-hand) cabin — *Felling date:* **Winter 1829/30**

ARCOLA PLANTATION, Loudoun Co; Slave Quarters
- (a) West Duplex — *Felling dates:* **Winter 1811/12** and **Spring 1813**
- (b) East Duplex — *Felling dates:* **Winter 1844/5**

WALNUT VALLEY PLANTATION, Surry Co; Cabin — *Felling dates:* **Spring 1815** and **Winter 1815/16**

BACON'S CASTLE PLANTATION, Surry Co; Slave Quarters
- (a) Left-hand side — *Felling date:* **Winter 1828/9**
- (b) Right-hand extension — *Felling date:* **Winter 1847/8**

BEN LOMOND, MANASSAS, Prince William Co; Cabin — *Felling dates:* **Winter 1833/4** and **Spring 1834**

LOGAN FARM, Ivor, Isle of Wight Co; Slave Cabin
- (a) Re-used timbers — *Felling date:* **Winter 1785/6**
- (b) Present structure — *Felling date:* **Winter 1837/8**

SHERWOOD FOREST PLANTATION, Stafford Co; Slave Quarters — *Felling dates:* **Winter 1845/6**

SPRING HILL FARM, Culpeper Co.; Slave Quarters — *Felling dates:* **Winter 1857/8** and **Spring 1858**

Dates sampled: 7th – 9th December 2007 and 13th – 14th October 2008

Owners: Various individual owners and associations

Commissioners: University of Mary Washington and Mount Vernon Ladies' Association

Historical Research: Douglas Sanford (UMW) and Dennis Pogue (MVLA)

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How Dendrochronology Works

Dendrochronology has over the past 20 years become one of the leading and most accurate scientific dating methods. Whilst not always successful, when it does work, it is precise, often to the season of the year. Tree-ring dating to this degree of precision is well known for its use in dating historic buildings and archaeological timbers. However, more ancillary objects such as doors, furniture, panel paintings, and wooden boards in medieval book-bindings can sometimes be successfully dated.

The science of dendrochronology is based on a combination of biology and statistics. Fundamental to understanding of how dendrochronology works is the phenomenon of tree growth. Essentially, trees grow through the addition of both elongation and radial increments. The elongation takes place at the terminal portions of the shoots, branches, and roots, while the radial increment is added by the cambium, the zone of living cells between the wood and the bark. In general terms, a tree can be best simplified by describing it as a cone, with a new layer being added to the outside each year in temperate zones, making it wider and taller.

An annual ring is composed of the growth which takes place during the spring and summer and continues until about November when the leaves are shed and the tree becomes dormant for the winter period. For the two principal American oaks, the white and red (*Quercus alba* and *Q. rubra*), as well black ash (*Fraxinus nigra*), and many other species, the annual ring is composed of two distinct parts: the spring growth or early wood, and the summer growth, or late wood. Early wood is composed of large vessels formed during the period of shoot growth which takes place between March and May, before the establishment of any significant leaf growth. This is produced by using most of the energy and raw materials laid down the previous year. Then, there is an abrupt change at the time of leaf expansion around May or June when hormonal activity dictates a change in the quality of the xylem, and the summer, or late wood is formed. Here the wood becomes increasingly fibrous and contains much smaller vessels. Trees with this type of growth pattern are known as ring-porous, and are distinguished by the contrast between the open, light-coloured early wood vessels and the dense, darker-coloured late wood.

Other species of tree are known as diffuse-porous, and this group includes the tulip, or yellow-poplar (*Liriodendron tulipifera L.*). Unlike the ring-porous trees, the spring vessels consist of a very small spring vessels which become even smaller as the tree advances into the summer growth. The annual growth rings are often very difficult to distinguish under even a powerful microscope, and one often needs to study the medullary rays, which thicken at the ring boundaries.

Dendrochronology utilises the variation in the width of the annual rings as influenced by climatic conditions common to a large area, as opposed to other more local factors such as woodland competition and insect attack. It is these climate-induced variations in ring widths that allow calendar dates to be ascribed to an undated timber when compared to a firmly-dated sequence. If a tree section is complete to the bark edge, then when dated a precise date of felling can be determined. The felling date will be precise to the season of the year, depending on the degree of formation of the outermost ring. Therefore, a tree with bark which has the spring vessels formed but no summer growth can be said to be felled in the spring, although it is not possible to say in which particular month the tree was felled.

Another important dimension to dendrochronological studies is the presence of sapwood and bark. This is the band of growth rings immediately beneath the bark and comprises the living growth rings which transport the sap from the roots to the leaves. This sapwood band is distinguished from the heartwood by the prominent features of colour change and the blocking of the spring vessels with tyloses, the waste products of the tree's growth. The heartwood is generally darker in colour, and the spring vessels are usually blocked with tyloses. The heartwood is dead tissue, whereas the sapwood is living, although the only really living, growing, cells are in the cambium, immediately beneath the bark. In the American white oak (*Quercus* alba), the difference in colour is not generally matched by the change in the spring vessels, which are often filled by tyloses to within a year or two of the terminal ring. Conversely, the spring vessels in the American red oak (*Q* rubra) are almost all free of tyloses, right to the pith. Generally the sapwood

retains stored food and is therefore attractive to insect and fungal attack once the tree is felled and therefore is often removed during conversion.

Methodology: The Dating Process

All timbers sampled were of oak (*Quercus* spp.) and pine (*Pinus* spp.) from what appeared to be primary first-use timbers, or any timbers which might have been re-used from an early phase. Those timbers which looked most suitable for dendrochronological purposes with complete sapwood or reasonably long ring sequences were selected. *In situ* timbers were sampled through coring, using a 16mm hollow auger. Details and locations of the samples are given in the summary table.

The dry samples were sanded on a linisher, or bench-mounted belt sander, using 60 to 1200 grit abrasive paper, and were cleaned with compressed air to allow the ring boundaries to be clearly distinguished. They were then measured under a x10/x30 microscope using a travelling stage electronically displaying displacement to a precision of 0.01mm. Thus each ring or year is represented by its measurement which is arranged as a series of ring-width indices within a data set, with the earliest ring being placed at the beginning of the series, and the latest or outermost ring concluding the data set.

As indicated above, the principle behind tree-ring dating is a simple one: the seasonal variations in climate-induced growth as reflected in the varying width of a series of measured annual rings is compared with other, previously dated ring sequences to allow precise dates to be ascribed to each ring. When an undated sample or site sequence is compared against a dated sequence, known as a reference chronology, an indication of how *good* the match is must be determined. Although it is almost impossible to define a visual match, computer comparisons can be accurately quantified. Whilst it may not be the best statistical indicator, Student's (a pseudonym for W S Gosset) *t*-value has been widely used amongst British dendrochronologists. The cross-correlation algorithms most commonly used and published are derived from Baillie and Pilcher's CROS programme (Baillie and Pilcher 1973), although a faster version (Munro 1984) giving slightly different *t*-values is sometimes used for indicative purposes.

Generally, *t*-values over 3.5 should be considered to be significant, although in reality it is common to find demonstrably spurious *t*-values of 4 and 5 because more than one matching position is indicated. For this reason, dendrochronologists prefer to see some *t*-value ranges of 5, 6, or higher, and for these to be well replicated from different, independent chronologies with local and regional chronologies well represented. Users of dates also need to assess their validity critically. They should not have great faith in a date supported by a handful of *t*-values of 3's with one or two 4's, nor should they be entirely satisfied with a single high match of 5 or 6. Examples of spurious *t*-values in excess of 7 have been noted, so it is essential that matches with reference chronologies be well replicated, and that this is confirmed with visual matches between the two graphs. Matches with *t*-values of 10 or more between individual sequences usually signify having originated from the same parent tree.

In reality, the probability of a particular date being valid is itself a statistical measure depending on the *t*-values. Consideration must also be given to the length of the sequence being dated as well as those of the reference chronologies. A sample with 30 or 40 years growth is likely to match with high *t*-values at varying positions, whereas a sample with 100 consecutive rings is much more likely to match significantly at only one unique position. Samples with ring counts as low as 50 may *occasionally* be dated, but only if the matches are very strong, clear and well replicated, with no other significant matching positions. This is essential for intra-site matching when dealing with such short sequences. Consideration should also be given to evaluating the reference chronology against which the samples have been matched: those with well-replicated components which are geographically near to the sampling site are given more weight than an individual site or sample from the opposite end of the country.

It is general practice to cross-match samples from within the same phase to each other first, combining them into a site master, before comparing with the reference chronologies. This has the advantage of averaging

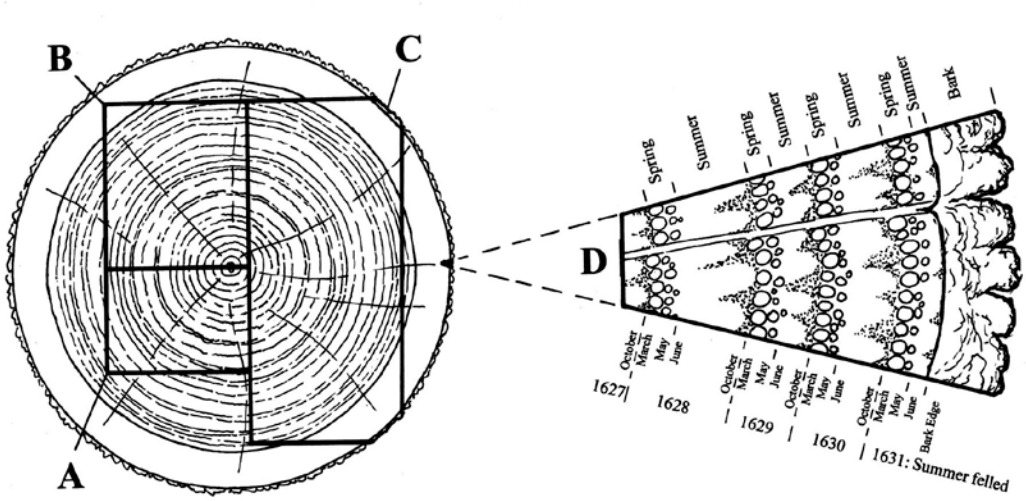
out the 'noise' of individual trees and is much more likely to obtain higher *t*-values and stronger visual matches. After measurement, the ring-width series for each sample is plotted as a graph of width against year on log-linear graph paper. The graphs of each of the samples in the phase under study are then compared visually at the positions indicated by the computer matching and, if found satisfactory and consistent, are averaged to form a mean curve for the site or phase. This mean curve and any unmatched individual sequences are compared against dated reference chronologies to obtain an absolute calendar date for each sequence. Sometimes, especially in urban situations, timbers may have come from different sources and fail to match each other, thus making the compilation of a site master difficult. In this situation samples must then be compared individually with the reference chronologies.

Therefore, when cross-matching samples with each other, or against reference chronologies, a combination of both visual matching and a process of qualified statistical comparison by computer is used. The ring-width series were compared on an IBM compatible computer for statistical cross-matching using a variant of the Belfast CROS program (Baillie and Pilcher 1973). A version of this and other programmes were written in BASIC by D Haddon-Reece, and re-written in Microsoft Visual Basic by M R Allwright and P A Parker.

Ascribing and Interpreting Felling Dates

Once a tree-ring sequence has been firmly dated in time, a felling date, or date range, is ascribed where possible. For samples which have sapwood complete to the underside of, or including bark, this process is relatively straight forward. Depending on the completeness of the final ring, i.e. if it has only the early wood formed, or the latewood, a *precise felling date and season* can be given.

Where the sapwood is partially missing, or if only a heartwood/sapwood transition boundary survives, then the question of when the tree was felled becomes considerably more complicated. In the European oaks, sapwood tends to be of a relatively constant width and/or number of rings. By determining what this range is with an empirically or statistically-derived estimate is a valuable aspect in the interpretation of tree-ring dates where the bark edge is not present (Miles 1997). The narrower this range of sapwood rings, the more precise the estimated felling date range will be.



Section of oak tree with conversion methods showing three types of sapwood retention resulting in **A** *terminus post quem*, **B** a felling date range, and **C** a precise felling date. Enlarged area **D** shows the outermost rings of the sapwood with growing seasons (Miles 1997, 42)

Unfortunately, it has not been possible to apply an accurate sapwood estimate to either the white or red oaks at this time. Primarily, it would appear that there is a complete absence of literature on sapwood estimates for oak anywhere in the country (Grissino-Mayer, *pers comm*). The matter is further complicated in that the sapwood in white oak (*Quercus alba*) occurs in two bands, with only the outer ring or two being free of

tyloses in the spring vessels (Gerry 1914; Kato and Kishima 1965). Out of some 50 or so samples, only a handful had more than 3 rings of sapwood without tyloses. The actual sapwood band is differentiated sometimes by a lighter colour, although this is often indiscernible (Desch 1948). In archaeological timbers, the lighter coloured sapwood does not collapse as it does in the European oak (*Q rober*), but only the last ring or two without tyloses shrink tangentially. In these circumstances the only way of being able to identify the heartwood/sapwood boundary is by recording how far into the timber wood boring beetle larvae penetrate, as the heartwood is not usually susceptible to attack unless the timber is in poor or damp conditions. Despite all of these drawbacks, some effort has been made in recording sapwood ring counts on white oak, although the effort is acknowledged to be somewhat subjective.

As for red oaks (*Quercus rubra*) it will probably not be possible to determine a sapwood estimate as these are what are known as 'sapwood trees' (Chattaway 1952). Whereas the white oak suffers from an excess of tyloses, these are virtually non-existent in the red oak, even to the pith. Furthermore, there is no obvious colour change throughout the section of the tree, and wood-boring insects will often penetrate right through to the centre of the timber. Therefore, in sampling red oaks, it is vital to retain the final ring beneath the bark, or to make a careful note of the approximate number of rings lost in sampling, if any meaningful interpretation of felling dates is to be made.

Similarly, no study has been made in estimating the number of sapwood rings in tulip-poplar or black ash, or for any of the pines.

Therefore, if the bark edge does not survive on any of the timbers sampled, then only a *terminus post quem* or *felled after* date can be given. The earliest possible felling date would be the year after the last measured ring date, adjusted for any unmeasured rings or rings lost during the process of coring.

Some caution must be used in interpreting solitary precise felling dates. Many instances have been noted where timbers used in the same structural phase have been felled one, two, or more years apart. Whenever possible, a *group* of precise felling dates should be used as a more reliable indication of the *construction period*. It must be emphasised that dendrochronology can only date when a tree has been felled, not when the timber was used to construct the structure under study. However, it is common practice to build timber-framed structures with green or unseasoned timber and that construction usually took place within twelve months of felling (Miles 1997).

Details of Dendrochronological Analysis

The results of the dendrochronological analysis for the buildings under study are presented in a number of detailed tables. The most useful of these is the summary **Table 1**. This gives most of the salient results of the dendrochronological process, and includes details for each sample, its species, location, and its felling date, if successfully tree-ring dated. This last column is of particular interest to the end user, as it gives the actual year and season when the tree was felled, if bark is present, and an estimated felling date range if the sapwood was complete on the timber but some was lost in coring, or a *terminus post quem*. Often these *terminus post quem* dates begin far earlier than those with precise felling dates. This is simply because far more rings have been lost in the initial conversion of the timber.

It will also be noticed that often the precise felling dates will vary within several years of each other. Unless there is supporting archaeological evidence suggesting different phases, all this would indicate is either stockpiling of timber, or of trees which have been felled or died at varying times but not cut up until the commencement of the particular building operations in question. When presented with varying precise felling dates, one should always take the *latest* date for the structure under study, and it is likely that construction will have been completed for ordinary vernacular buildings within twelve or eighteen months from this latest felling date (Miles 1997).

Table 2 gives an indication of the statistical reliability of the match between one sequence and another. This shows the *t*-value over the number of years overlap for each combination of samples in a matrix table. It should be born in mind that *t*-values with less than 80 rings overlap may not truly reflect the same degree of match and that spurious matches may produce similar values.

First, multiple radii have been cross-matched with each other and combined to form same-timber means. These are then compared with other samples from the site and any which are found to have originated from the same parent tree are again similarly combined. Finally, all samples, including all same timber and same tree means are combined to form one or more site masters. Again, the cross-matching is shown as a matrix table of *t*-values over the number of years overlaps. Reference should always be made to **Table 1** to clearly identify which components have been combined.

Table 3 shows the degree of cross-matching between the site master(s) with a selection of reference chronologies. This shows the county or region from which the reference chronology originated, the common chronology name together with who compiled the chronology with publication reference and the years covered by the reference chronology. The years overlap of the reference chronology and the site master being compared are also shown together with the resulting *t*-value. It should be appreciated that well replicated regional reference chronologies, which are shown in **bold**, will often produce better matches then with individual site masters or indeed individual sample sequences. Due to the fact that chronologies are still to be developed for many parts of the eastern seaboard of America, the number of chronologies are often limited to just one or two, and this information would alternatively be presented in the summary text.

Figures include a bar diagram which shows the chronological relationship between two or more dated samples from a phase of building. The site sample record sheets are also appended, together with any plans showing sample locations, if available.

Publication of all dated sites for English buildings are routinely published in *Vernacular Architecture* annually, but regrettably there is at the present time no vehicle available for the publication of dated American buildings. However, a similar entry is shown on the summary page of the report, and this hopefully could be used in any future publication of American dates. This does not give as much technical data for the samples dated, but does give the *t*-value matches against the relevant chronologies, provides a short descriptive paragraph for each building or phase dated, and gives a useful short summary of samples dated. These summaries are also listed on the web-site maintained by the Laboratory, which can be accessed at `www.dendrochronology.com`. The Oxford Dendrochronology Laboratory retains copyright of this report, but the commissioner of the report has the right to use the report for his/her own use so long as the authorship is quoted. Primary data and the resulting site master(s) used in the analysis are available from the Laboratory on request by the commissioner and bona fide researchers. The samples form part of the Laboratory archives, unless an alternative archive, such as the Colonial Williamsburg Foundation in association with the ODL, has been specified in advance.

Summary of Dating

Four Square Plantation

Summary:

FOUR SQUARE PLANTATION, Isle of Wight Co; Slave Quarters (36.96426º N; -76.6892ºW)

(a) South (right-hand) cabin *Felling dates:* **Winter 1788/9**

(b) North (left-hand) cabin *Felling date:* **Winter 1829/30**

(a) Corner posts 1788C; Door posts (1/2) 1788(C); Ceiling joists (1/2) 1783; Rafter (0/1); Wall-plate (0/1). (b) Corner posts (0/3); Ceiling joist (0/1); Floor joists 1829(C), 1786; Brace (0/1). *Site Masters* (a) 1576-1788 FSQx1 (pine) (*t* = 5.3 SJC; 4.8 WVVAP; 4.8 LVNx1; 4.6 fct1); (b) 1728-1829 FSQx2 (pine) (*t* = 6.9 VA021; 6.6 BAC; 6.0 LGN).

This slave quarter is comprised of two framed single-celled cabins with garrets supported on brick piers. The southern cabin is as constructed, incorporating some timbers felled in 1788/9, although these may have been reused from a previous building as the present structure was thought to have been constructed *circa* 1810, shortly after the main plantation house was built. The north cabin was constructed from timbers felled in 1829/30, and was subsequently moved and attached to the existing southern cabin.

Detailed analysis:

The frame duplex cabin is one story with a garret, covered by a gable roof and horizontal wooden siding (both modern replacements), supported by brick piers, with a central brick chimney that is largely collapsed. The two first floor rooms are accessed via single doorways centered in their bays on the west facade, with single windows in the opposite wall, and in each gable. An enclosed stair is located in the southwest corner of the south room, providing access to the garret. The garret appears to have been divided into two rooms at the chimney stack. No stair currently exists to provide access to the garret above the north room, but evidence in the framing suggests that a second stair was located in the southeast corner of the north room. In addition to the collapsed chimney/fireplace, a structural post in the east wall has failed, causing the adjoining wall section to deflect, and in turn resulting in considerable additional deterioration of the siding and of structural members. Unless remedial efforts to correct this situation are undertaken in the near future, the preservation of the building is seriously in doubt. The frame duplex is 168 feet from the SW corner of the building to the NE corner of the shed addition of the main house at 220º.

The majority of the timbers used in the construction of both cabins were of southern yellow pine (*Pinus L.*). The only exception to this were the four corner posts to the north cabin, which were of white oak (*Quercus Alba*).

Considerable evidence exists to suggest that the structure consists of two phases of construction, with the second phase likely the result of moving and appending an existing structure to the original cabin. Structural evidence relating to the manner in which the structures were joined together suggests that the current south bay was the first to be erected on this site. Therefore both sections were sampled separately, with nine pine samples being taken from the west cabin and seven samples from the east cabin, four of pine and three of oak.

From the south cabin, two timbers were found to have originated from the same parent tree: the south-west and the south-east corner posts (**fsq3** and **fsq4**). These were combined to form the same-tree mean **fsq34**, which was used in the subsequent analysis. This was found to match with an upstairs floor joist (**fsq6**) and the north doorpost (**fsq1a1** and **fsq1a2**). These were combined to form the 213-ring site master **FSQx1**. Although initially this was only tentatively dated, spanning the years 1576-1788, these matches were subsequently confirmed with additional pine samples from the region.

Two of the timbers retained bark edge, allowing for precise felling dates to be ascribed. The north doorpost (**fsq1a2**) and south-east corner post (**fsq4**) were both found to have been felled in the winter of 1788/9. Given that the south-west corner post (**fsq3**) was from the same tree as **fsq4**, therefore the same felling date of winter 1788/9 can be ascribed to this timber. The upstairs floor joist (**fsq6**) did not have bark edge, but the last measured ring date of 1783 is consistent with the 1788/9 felling date derived for other timbers.

The north cabin proved more difficult. None of the oak or pine timbers above ground-floor level retained complete sapwood with a suitable number of rings. Two pine ground-floor joists (**fsq16** and **fsq17**) did match together, and were combined to form the 102-ring site master **FSQx2**. This was found to date, spanning the years 1728-1829. The three oak corner posts (**fsq11**, **fsq12**, and **fsq13**) were found to match together and were combined to form the 87-year site master **FSQx3**. Unfortunately this sequence failed to date conclusively.

Of the two pine floor joists which dated, only one retained bark edge (**fsq16**). This timber was found to have been felled in the winter of 1829/30. The other joist without bark edge had a last measured ring date of 1786, which does not conflict with the 1829/30 felling date.

None of the other pine samples from either phase of the building cross-matched, or dated individually.

Upton (1982, 1988) hypothesised an original construction date of circa 1810 for the south cabin, primarily based on the ascribed date of construction of the nearby main house as occurring in 1807. He recognised that the existing structure was the result of two phases of construction, further hypothesising that the addition dated to the second quarter of the 19th century. The 1788/9 tree-ring felling dates are substantially earlier than those postulated by Upton. It is possible that these timbers were reused from an earlier cabin, later reconstructed, or that the south cabin is basically as originally constructed, and relates to an earlier farmstead. None of the members from which the samples were taken show any evidence for having being reused. At the north end of the Phase I building, however, there are a number of members that exhibit evidence of changes, most of which seem consistent with accommodating the framing in joining two existing buildings. The one exception is a truly puzzling situation. The northeast corner post clearly was inverted, as two empty mortises exist at the base of the post that clearly to relate to tenons for corner braces. This situation is equally puzzling whether it relates to accommodating the addition or to reusing material, as inverting the post would not be necessary in either case. The date of 1829/30 for a joist from the north cabin probably relates to the initial construction phase of the cabin, rather than the date at which it was moved and attached to the pre-existing south cabin.

Arcola Slave Quarters

Summary:

ARCOLA PLANTATION, Loudoun Co; Slave Quarters (38.946844º N; -77.528538º W)

(a) West Duplex *Felling dates:* **Winter 1811/12** and **Spring 1813**

(b) East Duplex *Felling dates:* **Winter 1844/5**

(a) Ceiling joists (5/7) 1812 (¼C^3), 1802, 1793; Rafter 1802 (+9 NM); Door lintel 1811(C); Stud 1754. (b) Ceiling joists (8/10) 1844(C^5), 1842, 1835, 1823(+22 NM). *Site Master* 1570-1844 ARC (oak) (*t* = 7.0 VA2008x; 6.9 WATVA; 6.7 PIEDMONT; 6.7 UTCx1).

This one-story stone, gable-roofed building consists of a pair of duplexes, each with two first-floor rooms. The rooms were once separate compartments, each accessed via single doorways set in the south façade. The western duplex was built first around 1813, which also included a small cellar under the western room with external door. This building was then extended to the east in 1845 by a further two rooms.

Detailed analysis:

This one-story stone, gable-roofed building consists of four first-floor rooms, all of which once were separate compartments, each accessed via single doorways set in the south façade. The four rooms are arranged like two duplexes placed end to end, with a single chimney serving each pair of rooms (a later opening was made in the partition to link the two eastern rooms). The doorways in the east duplex have been enlarged to accommodate a function as a garage. Windows in each room are set in the opposing north wall, with another window located in the gable in the western most room. A full cellar with an exterior doorway in the end wall is located under this room. The overall dimensions of the structure are 60’ by 16’9”, with the eastern duplex approximately three feet longer than the original.

A garret that may have served as living space is contained within the roof above all four of the first floor rooms. There is evidence (opposing notches in the ceiling joists) for trimmer boards to accommodate a stair in one room in each of the duplexes; remnants of floor boards exist nailed to the tops of the ceiling joists in both duplexes. Remnants of a partition (studs, nails, and fragments of partition boards) found on either side of the chimney stack in both duplexes indicate that the garret was divided into four spaces. The floor in three of the four rooms appears to have been packed earth; a wooden floor (modern replacement) is in the room above the cellar.

The structure was built in two phases. The western portion was built first, following the design of a duplex quarter, with the two non-communicating first floor rooms served by a central chimney. A fireplace (now blocked) appears to have existed in the cellar room as well. Evidence indicating that the western portion was the first phase of construction includes: the stone walls for the eastern addition abut the end wall of the western duplex, and the east gable of the Phase I structure, complete with window frame and remnants of pintles for an exterior shutter, survives within the roof of the addition. Structural differences between the two phases are relatively subtle, consisting of different types of stone and the method of coursing, the use of hand-headed nails in Phase I and machine-headed nails in Phase II, and tapered and squared rafters in Phase I and flattened, debarked poles in Phase II.

Ten timbers were sampled from the west duplex, and a further ten timbers were sampled from the east duplex. All of the structural timbers were of oak, with those from the west duplex being of red oak (*Quercus Rubra*) and the east duplex being a mixture of red and white oak (*Q. Alba*). As the walls were of stone, and the floors of dirt (except the later cellar ceiling below the western end of the building) only the ceiling joists and roof structure were available for sampling. However, the rafters were generally too small for sampling, with the sapwood in poor condition. The gable-end studwork on the centre of the building

was also of oak, however none of the timbers retained bark edge, but a lintel above the east door of the west duplex was suitable for sampling.

After combining same-timber means (only one pair cross-matched cleanly enough to be combined to form the same-timber mean arc4), the sequences were cross-matched. One pair of timbers from the east duplex, arc15a1 and arc16, were found to have originated from the same parent tree, and were combined to form the same-tree mean arc156. This was used in the subsequent analysis. This was found to match with ten other samples and were combined to form the 275-year site master ARC. This dated with local and regional reference chronologies, spanning the years 1570-1844.

A number of samples did not match together very well, due mainly to distortions in the ring patterns. These were dated individually, but were not included in the site master. These included arc5a and arc5b, arc7, and arc11a and arc11b.

From the west duplex, four timbers provided precise felling dates. These ranged from the winter of 1811/12 for the east door inner lintel (arc9), to the spring of 1813 for several ceiling joists (arc1, arc5b, and arc6). This would suggest a construction period during 1813 for this part of the building, using a slightly seasoned timber for the lintel. The east duplex produced six precise felling dates, including arc15a1 which was from the same tree as arc16, all of which were from the winter of 1844/5. This strongly suggests that this extension was constructed during 1845. A number of samples without sapwood from both phases also dated, producing last measured ring dates consistent with the other felling dates from the same phase of construction. A stud from the east end of the west duplex (arc10) had a last measured ring date of 1754. However, this sample had very narrow rings (mean ring width of 0.46mm) and by losing only an inch of the outermost surface of the log during conversion would have accounted for over half a century of growth.

The dendrochronological test results support the finding that the structure was constructed in two phases, with a date of circa 1813 for Phase I (west duplex) and circa 1845 for Phase II. While the 1813 date for Phase I is not particularly surprising, given the evidence of hand headed nails in the siding and the window trim, and a thin bead (<3/8”) incorporated into the window casing, the span of more than 30 years between phases seems notable. Although the requirements of building on to an existing structure would impose limits on the character of the addition, and the fact that it is a stone structure would further restrict possible variations, the differences between the two phases are minor. They primarily consist of different types of nails (hand-headed versus machine-headed) and treatment of the rafters.

Walnut Valley Plantation

Summary:

WALNUT VALLEY PLANTATION, Surry Co; Cabin (37.14034º N; -76.723387º W)

Felling dates: **Spring 1815** and **Winter 1815/16**

Corner posts 1815 (20C), 1814(51¼C); Down braces (2/4) 1813(11), 1803(20); Door post 1812(15+3C NM); Chimney post (0/1); Door hinges (0/2). *Site Master* 1654-1815 WVY (oak) (*t* = 7.8 GLOx1; 5.5 VA2008x; 5.4 EYREHALL; 5.3 HQFx10).

This cabin, dating to 1816, is a frame, one-story, with an unheated garret, and supported by six brick piers. The walls are clad in beaded wooden weather boards. The first floor consists of a single room, with an exterior chimney. The north door is original, whilst the south doorway (slightly larger and off line with the north door) is a later alteration. A ladder stair currently is positioned in the north-west corner of the room, but evidence in the form of a surviving header indicates that the stair originally was placed in the opposite corner, overlapping slightly with the fireplace. Probably at the same time that the stairway was repositioned, the partition in the garret was shifted from the east to the west end of the structure. The door in the current partition is hung on a pair of large wooden hinges that are attached to the door using machine cut and headed nails.

Detailed analysis:

The structure is frame, one-story, with an unheated garret, covered by a gable roof (currently standing seam metal), clad in wooden weather boards, and supported by six brick piers. The first floor consists of a single room, with an exterior chimney (3:1 bond with pencilled joints) serving a fireplace centred on the east facade, and with doorways and single windows in the two principal facades. The north door is board and batten and appears to be original, while the south doorway (slightly larger and off line with the north door) is a later addition. A ladder stair currently is positioned in the north-west corner of the room, but evidence in the form of a surviving header indicates that the stair originally was placed in the opposite corner, overlapping slightly with the fireplace. The sills, first-floor joists and floor boards, and at least portions of the exterior siding are later replacements, comprised of circular sawn timbers and attached with wire nails. Square, machine-cut nails and some hand-headed T-nails survive in the original 4/4 window sash and frames, fascia, and crown mouldings. Probably at the same time that the stairway was repositioned, the partition in the garret was shifted from the east to the west end of the structure. The door in the current partition is hung on a pair of large wooden hinges that are attached to the door using machine cut and headed nails.

This uninhabited structure, now located on Chippokes State Park, has undergone significant alterations within the relatively recent past (20th century), as well as considerably earlier. The more recent alterations include replacing the sills and many of the first floor joists with circular sawn timber, inserting sistered joists and wooden blocks to reinforce the first floor, replacing the flooring, adding a second exterior doorway, and replacing/repairing the brick piers. An earlier campaign of alterations may have included rebuilding the upper portion of the chimney, changing out portions of the siding and the fascia (circular sawn with wire nails), cladding the interior of the first floor with siding (wide horizontal boards attached with machine-cut nails, sash sawn, with whitewash and, in some areas, newspapers), and changing the locations of both the ladder stair to the garret and the garret partition.

What appear to be original corner boards are beaded and attached with machine-cut nails. On the east facade, north of the chimney, the exterior siding is attached with machine-cut nails below the level of the soffit, but this also may be replaced as a ghost in the chimney mortar does not match with the current siding. The window frames and sash exhibit hand-headed T-headed nails and brads, supporting a first-quarter 19th-century construction date. The ceiling joists extend beyond the plate, with what appears to be an original beaded fascia board nailed to the joists on the north facade, and with a beaded crown board above; the fascia on the rear facade has been replaced with an unbeaded board. The later interior siding boards are not

bevelled and are either gapped, with battens on the exterior side (such as on the west wall) or butted. On the north, east, and south walls, the circular sawn boards are confined to the top 2 to 3 feet and are 12-13 in. wide. The above description is drawn partly from Cohen 2006; for a brief history of the property and description of the main house, see Kornwulf 1976.

A total of ten timbers were sampled from the structure. These included posts, braces, and the two door hinge bands. All of the structural timber to the ground floor walls was found to be of white oak (*Quercus Alba*), whilst the ceiling joists and roof structure were of tulip-poplar (*Liriodendron tulipifera L*), and the upstairs partition was constructed of studs of black-ash (*Fraxinus nigra*). Only the oak timbers were selected for sampling.

After multiple samples were combined to form same-timber means, the data was cross-matched and the two hinge bands were found to have originated from the same parent tree. These were combined to form the same-tree mean **wvy910**. The sequences were then compared and five were found to match together to form the 162-year site master **WVY**. This was compared with local and regional reference chronologies and was found to date, spanning the years 1654-1815.

Three of the dated timbers retained bark edge, enabling precise felling dates to be given. These included the spring of 1815 for the SW corner post (**wvy7**), whilst the north-west corner post (**wvy1**) and the west door post (**wvy3**) were both felled in the winter of 1815/16. Two other dated timbers **wvy2**and **wvy8** had last measured ring date of 1803 and 1813 respec5ively, and which were consistent with an 1815/16 felling date. Therefore, the cabin was probably constructed in 1816 or shortly there after.

Unfortunately the two hinge bands failed to date, despite having been found to have originated from the same tree.

Bacon's Castle Slave Quarter

Summary:

BACON'S CASTLE PLANTATION, Surry Co; Slave Quarters (37.10658º N; -76.7229º W)

(a) North (Left-hand side) *Felling date:* **Winter 1828/9**

(b) South (Right-hand extension) *Felling date:* **Winter 1847/8**

(a) Ceiling joists 1828(C), 1807, 1788; Principal rafter (0/1); rafters (0/3). (b) Ceiling joists 1847(C), 1842; Rafters (0/3); Wall-plate (0/1); Studs (0/2); Post (0/1). *Site Master* 1730-1847 BAC (pine) (*t* = 8.9 SJC; 6.7 VA021; 6.6 FSQx2; 6.2 LGN).

This 1½ -story pine-framed duplex has a gable roof, horizontal siding, and two exterior end chimneys. The building rests on brick piers and has a porch centred on its front (west) façade that covers the three exterior doorways, one each for the two downstairs rooms, and a third that opens onto the central staircase providing access to the two garret rooms. The interior walls of the first floor rooms are covered with wood, butted planks in the south room and beaded siding in the north. Each of the garret rooms has a brick fireplace and gable-end windows. The building is the result of two phases of construction, with the earliest section to the north constructed *circa* 1829, and was extended southwards in about 1848.

Detailed analysis:

This 1.5-story frame duplex has a gable roof, horizontal siding, and two exterior end chimneys. The building rests on brick piers and has a porch centred on its front (west) façade that covers the three exterior doorways, one each for the two downstairs rooms, and a third that opens onto the central staircase providing access to the two garret rooms. The interior walls of the first floor rooms are covered with wood, butted planks in the south room and beaded siding in the north. Each of the garret rooms has a brick fireplace and gable-end windows. The quarter is located 123 feet (from the SW corner of the quarter) from the NE corner of the two story addition of the main house, at an angle of 136º.

Close examination of the upper plates and the roof frame indicates that the building is the result of two phases of construction. The primary structural evidence for this interpretation consists of the different (wider) spacing of the rafters that begins at a point within what is now the south garret room, along with corresponding lap joints in both the front and rear plates.

The presence of two posts centred in the west wall of the Phase I structure indicates the probable location of the original doorway. The half-story configuration of the building was an original feature. Conclusive evidence for the placement of the original stair has yet to be revealed, but a patch found in the garret flooring is highly suggestive, and may indicate that the stair was positioned along the rear wall roughly opposite the Phase I doorway. While the central placement of the door posts suggests that the plan of the Phase I structure may have consisted of a single first-floor room, the relatively large footprint dimensions (@24 by 14 feet) suggest that it may have been divided into more than one space. The presence of empty mortises (half-lapped, angled downward) located in the posts and studs along the west façade of the Phase I section of the building suggests the previous location of a porch. In the Phase I section of the building, there is no intermediate plate along the west (front) wall – the posts and studs run the full distance from the sill to the top plate – but there is an intermediate plate on the east wall. In Phase II, there is no intermediate plate in either the east or west walls. A rear kitchen addition that was constructed in the late 19th century was removed by the APVA. Window 3 was cut to make a doorway into the rear ell and then was replaced once the addition was removed (Upton 1982, 1988).

Both sections of the building were found to have been constructed entirely of southern yellow pine (*Pinus L.*). Much of this material was of small scantling and fast-grown, resulting in few timbers suitable for dendrochronological analysis. Seven timbers were sampled from the original, left-hand section, with an

additional nine samples from the right-hand extension. After combining multiple samples from the same timbers, all of the samples were cross-matched between themselves and two groups were formed. The first was the mean **bac123**, composed of **bac1**, **bac2**, and **bac3**. This 72-ring mean failed to match with any of the local or regional reference chronologies, or with any of the other samples from the site.

Five other samples, **bac5**, **bac6**, **bac7**, **bac18**, and **bac19** were combined to form the 118-ring site master **BAC**. This sequence was found to date, spanning the years 1730-1847, with the strongest match being found with the chronology from St John's Church, Richmond.

Three of the dated timbers came from the primary phase of the building. These were floor joists and one had a precise felling date of winter 1828/9. The other two had last measured ring dates of 1807 and 1788, and taking into account missing rings during conversion, they were not inconsistent with this precise felling date. Two floor joists from the right-hand extension also dated, with one precise felling date of winter 1847/8 and the other without complete sapwood having a last measured ring date of 1842. Thus, the first phase of the quarters was constructed during or sometime shortly after 1829, and was extended during or shortly after 1848.

Ben Lomond Quarter

Summary:

BEN LOMOND, MANASSAS, Prince William Co; Cabin (38. 048767º N; -77.600215º W)

Felling dates: **Winter 1833/4** and **Spring 1834**

Floor joists 1833(14¼C, 14C^2), 1827(5), 1793, Rafters (3/4) 1833(9C, 12C), 1822(2). *Site Master* 1735-1833 BLV (oak) (*t* = 7.9 VA2008x; 7.9 ARC; 7.5 HQFx2; 6.5 WATCH).

This one-story stone building, with a garret, originally consisted of two rooms on the first floor, each with an end chimney, and divided by a wooden partition. Each room is accessed directly from the outside via doorways placed on the east facade. A short door located in the north gable provided exterior access to the garret. Originally constructed *circa* 1834, the building was moved about 1979 from one side of the main house to its current location on the other side.

Detailed analysis:

This one-story stone building, with a garret, originally consisted of two rooms on the first floor, each with an end chimney (fireplaces now blocked), and divided by a wooden partition (no longer extant) nailed to a joist (sixth joist from north). Each room is accessed directly from the outside via doorways placed on the east facade. A short door located in the north gable provided exterior access to the garret, but there is no stair at present and there is no visible evidence to indicate where it may have been located. There is evidence for whitewashing in the attic space. The building was moved ca. 1979 from a site on one side of the main house to its current location on the other side.

A framed opening in the ceiling in the south room provides access to the attic, but round nails used to attach the header indicate that the opening was a later addition. Evidence consisting of ghosts and nail holes indicate that there were two iterations of the partition, now gone, with the first partition attached with cut nails (based on square nail holes). Framing throughout is oak, pit-sawn and hewn. Windows were positioned in the long rear facade, one in each room. The window in the south room has been broken out to accommodate a doorway. There is one window in each gable in the attic, along with what appears to be a short door in the north gable.

As of 2008, the building was undergoing restoration by the Prince William County Parks Department. The major changes consisted of reinstalling the partition and a stairway to the garret, and re-establishing the window in the south room.

A total of nine timbers were sampled from this structure, five from floor joists and four from rafters. Three of the timbers were sampled twice to try and obtain complete sapwood. After combining two of these to form the same-timber mean **blv2**, this was compared with the remaining samples. A total of eight of these were found to cross-match and were combined to form the 99-ring site master **BLV**. This dated, spanning the years 1735-1833.

Five of the dated timbers retained bark edge allowing precise felling dates to be determined. Four of these were found to be felled in the winter of 1833/4, with the fifth having been felled slightly later, in the spring of 1834. The remaining three timbers did not have complete sapwood, but did produce last measured ring dates of 1793, 1822, and 1827, all consistent with the felling dates. Given this clustering of felling dates, construction is likely to have taken place during 1834.

Logan Farm Slave Quarter

Summary:

LOGAN FARM, Ivor, Isle of Wight Co; Slave Cabin (36º 95.87N; 76º 78.38W)

(a) Re-used timbers *Felling date:* **Winter 1785/6**

(b) Present structure *Felling date:* **Winter 1837/8**

(a) Ceiling joists 1785(C^2), Door post 1785(C). (b) Studs 1837(C), 1826; Ceiling joists (0/1); Braces (1/2) 1784), Post (0/1); Corner post (0/1). *Site Master* 1702-1837 LGN (pine) (*t* = 6.2 BAC; 6.0 FSQx2; 5.7 SJC; 4.8 VA021).

This frame duplex of 1837/8 is of one story with an attic, under a gable roof covered with wooden shingles. It has horizontal siding and rests on brick piers. Each of the first-floor rooms is accessed via a single doorway located in the east facade, with an added third doorway in the west wall of the south room. A substantial brick-lined cellar is positioned beneath the south room in front of the hearth. The partition appears to be comprised of reused siding boards, and several of the structural members also appear to have been salvaged from an earlier structure dating to 1785/6. There is no stair to the attic, but empty mortises in the joists in the north room suggest its possible location. At present, a section of flooring covers the joists above the south room, but it is unclear whether the space was floored originally.

Detailed analysis:

This frame duplex is one story with an attic, under a gable roof covered with deteriorated wooden shingles. It has horizontal siding (at least two generations of which survive) and rests on brick piers. Each of the first-floor rooms is accessed via a single doorway located in the east facade, with a third doorway (added) in the west wall of the south room. The fenestration has been substantially altered, possibly more than once, currently consisting of single sash windows in each room on the east facade, and two windows in each room on the west. Both spaces likely were heated originally by exterior end brick chimneys, but if so the one to the north is completely absent, while the chimney serving the south room still survives but largely has collapsed. At present, direct communication between the rooms is provided by a doorway (apparently added) set into the partition. A substantial brick-lined cellar is positioned beneath the south room in front of the hearth. The partition appears to be comprised of reused siding boards, and several of the structural members also appear to have been salvaged from an earlier structure. At present, there is no stair to the attic, but empty mortises in the joists in the north room suggest its possible location. At present, a section of flooring covers the joists above the south room, but it is unclear whether the space was floored originally.

The fireplace/chimney at the north end appears to be missing (as opposed to never having been built), as there is a 5'-9" space between the major posts on the wall which suggests spacing to accommodate a fireplace/chimney location (mirroring the condition on the opposite wall). In addition, the end sill has been replaced, which makes sense if the fireplace was removed; in comparison, on the opposite gable short sills extend from each corner that rest on the masonry stack, which may have been the original condition on the north wall.

A total of ten pine timbers were sampled from this building. These included braces, posts, studs, and ceiling joists. Several timbers had evidence of reuse such as disused mortices, peg holes, and beads. It was decided to amend the sampling strategy to include some of the clearly reused timbers to demonstrate that the other timbers were indeed freshly cut for the present structure.

After combining multiple samples from the same timber, the sequences were compared with each other and two were found to have originated from the same parent tree. Thus two studs lgn5 and lgn7 were combined to form the same-tree mean lgn57. This was compared with the remaining sequences and was found to match with four other samples: lgn2, lgn8, lgn9, and lgn10. These five sequences were then combined to form the 137-ring site master LGN. This was compared with local and regional reference chronologies and was found to match, spanning the years 1702-1837.

Of the six timbers dated, four retained complete sapwood. Three timbers, lgn8, lgn9,and lgn10, were all found to have been felled in the winter of 1785/6. Another timber, lgn5, was found to have been felled in the winter of 1837/8. A fifth timber, lgn7, could be ascribed with the same winter 1837/8 felling date as it originated from the same parent tree as lgn5. Sample lgn2 from a brace has been dated with a last measured ring date of 1784. Although this might initially appear to have been part of the 1785/6 phase of reused timbers, the brace actually lost 35mm of the outer part of the sapwood during coring, making it most likely to belong to the 1837/8 phase of construction.

The dendrochronology has identified two distinct phases of construction. The earliest dates to 1785/6 and relates to three timbers which had clear evidence for having been reused. Thus, they would have come from a building originally constructed during 1786 or shortly thereafter. They were then incorporated into the present cabin in 1838 or shortly thereafter. This is confirmed by the presence of different finishes and a bead incorporated into one or more corners.

Sherwood Forest Slave Quarter

Summary:

SHERWOOD FOREST PLANTATION, Stafford Co; Slave Quarters (38.788784º N; -77.506319º W)

Felling dates: **Winter 1845/6**

Rafters (7/8) 1845(C^2), 1833, 1822, 1801, 1770, Studs 1845(C^2). *Site Master* 1739-1845 SHR (pine) (*t* = 9.3 ME024; 7.1 ME016; 5.4 NH003; 4.9 ME018).

This one-story frame building, with garret under a gabled roof, is oriented north-south. Framing methods and nail types, along with documentary evidence, suggests that the building was constructed between the 1830s and early 1850s, according well with the tree-ring date of 1846. Two rooms on the first floor share a central chimney of sandstone, and each room has a ladder stair to the garret. Dendro-provenancing suggests the white pine studs and rafters originated from around Maine.

Detailed analysis:

This one-story frame building, with garret, under a gable roof, is oriented north-south. Framing methods and nail types, along with documentary evidence, suggests that the building was constructed between the 1830s and early 1850s. Two rooms on the first floor share a central chimney of sandstone, which changes from stone to brick as it exits the roof. A central partition of horizontal boards divides the structure into two rooms. Each room had a ladder stair that gave access to the garret space, which also had a central partition of boards. A replacement open stringer stair is located in the northern room's corner (opposite the fireplace), while the opening for the stairway in the southern room is visible in a similar position, along the gable end wall towards the corner. The first floor interior surfaces (wall boards, ceiling joists, underside of attic flooring) had been whitewashed. The first floor walls consisted of clay infill between studs that had been partially covered with flush boards of narrow width and spaces of various sizes. The front façade faces west and includes a door for each room located towards the building's corners, along with a single window for each room. Gable end windows exist on the south façade and in the attic spaces.

All of the timbers within the house were of white pine, with the exception of the sill beams which were of fast-grown oak. Therefore it was decided to sample the pine, which was exposed throughout the attic. Sampling was hindered by the fact that half of the northern roof was missing and the floor was in poor condition. A total of ten samples were taken – eight from rafters and two from the centre partition. Four of the rafters retained complete sapwood, the majority of the timbers had been cut square.

After combining same-timber means, the samples were compared with each other, and two were found to have originated from the same parent tree. Thus samples **shr2** and **shr5** were combined to form the same-tree mean **shr25**. This was compared with the other samples and all with the exception of **shr7** were found to match each other. These were combined to form the 207-year site master **SHR**. This was found to span the years 1639-1845. Exceptional matches were found with chronologies from Maine, suggesting that the timber was imported from that area.

Four of the timbers retained bark edge, all of which dated to the winter of 1845/6. This would suggest that the building was constructed during 1846 or 1847, depending on whether the timber was stock-piled before being transported to Virginia.

Spring Hill Duplex (northern building)

Summary:

SPRING HILL FARM, Culpeper Co.; Slave Quarters (38.048767º N; -78.600215º W)

Felling dates: **Winter 1857/8** and **Spring 1858**

Rafters 1857(C, 15C^2, 8C, 13C); Rails 1857(14¼C, 9C); wall plates 1857(13C, 11C); Girt 1853. *Site Master* 1759-1857 SPR (oak) (*t* = 8.1 HQFx; 7.8 VA2008x; 7.5 HQFx4; 7.0 HQFx2).

This one story with garret, timber-framed building is oriented north-south and is the more northerly of two surviving slave buildings. It dates to 1858 and has a rear, shed roof addition that likely dates to the antebellum period. The building's exterior has board and batten vertical siding. Two rooms on the first floor share a central chimney and there are two corresponding unheated rooms in the garret, which also had a central partition of boards and battens, but with no communication between the rooms. Originally the building had separate doorways for each first-floor room on the east façade. Access to the garret was provided by a stair in each room situated against the building's end walls and toward the western corner of each room.

Detailed analysis:

Located in Culpeper County, Virginia, this one story with garret, gable roof, frame building is oriented north-south and is the more northerly of two surviving slave buildings. It has a rear, shed roof addition that likely dates to the antebellum period. More secure dating evidence derives from fully formed machine-cut nails, placing construction to the 1830s or later. The dominance of hewn and sash-sawn timbers, flooring, and siding, along with the unglazed nature of original windows, typically suggests an earlier date, but given the nail type, an overall construction date could be in the 1840s, with the rear addition dating to the 1850s. The building's exterior has board and batten vertical siding. Two rooms on the first floor share a central chimney, which is comprised of brick resting on a stone base, with some stone used for the fireplace interiors. The original partitions to either side of the chimney have been removed. There are two corresponding rooms in the garret, which also had a central partition of boards and battens, with no communication between the rooms, and which were unheated spaces. Originally the building had separate doorways for each first-floor room on the east façade. The southern room's doorway was later converted to a window, while the northern room's doorway was removed during a later insertion of a large double door arrangement for farm vehicles, which also led to the removal of numerous floor boards. Access to the garret was provided by a stair in each room, with these stairs similarly situated against the building's end walls and toward the western corner of each room. An original, but repaired open stringer stair survives in the northern room's NW corner, while the southern room's stair has been removed. The building's interior finish consists of whitewash on exposed framing members, with this treatment also seen in the northern garret room. The rear addition involves similar framing and has machine-cut nails like the Period 1 duplex, although its floor is lower by 1.5 feet. A central partition divides the addition into two separate rooms.

The building was constructed entirely of oak, much of it relatively slow grown, although the sizes of the timber members were not large. Therefore, none of the timbers sampled had more than 100 growth rings. A total of ten timbers were sampled. These included two rails, two wall plates, a girt, and five rafters.

After combining multiple samples to form the same-timber means **spr5** and **spr9**, all of the timber sequences were compared with each other and two rafters (**spr6** and **spr9**) were found to have originated from the same parent tree and were combined to form the same-tree mean **spr69**. This was then found to match all of the other samples from the site with the sole exception of **spr5**, and were all combined to form the 99-year site master **SPR**. This was compared with local and regional reference chronologies and was found to date, spanning the years 1759-1857. Sample **spr5** was similarly compared with the reference chronologies and was also found to date, spanning the years 1785-1853.

Of the ten timbers which dated, all except **spr5** sample retained bark edge. Eight were found to have been felled in the winter of 1857/8 and one in the spring of 1858. This excellent clustering of precise felling dates suggest that the timber frame was framed up during 1858, and erected the same year, or the following year at the latest. Sample **spr5** did not retain complete sapwood, but the last measured ring date of 1853 would suggest that only a few sapwood rings were removed on converting the timbers from the round.

Conclusions

A total of 111 timbers were sampled from eight buildings in Virginia. Of these, 65 timbers dated, representing a total of 12 phases of construction. These ranged from a felling date of 1785/6 for a group of reused timbers at Logan Farm, 1788/9 for what is possibly an *in situ* assemblage at Four Square Plantation, to as late as 1858 at Spring Hill Farm.

Of the timbers sampled, 52 were of oak, both white and red, whilst 49 were of pine, mostly southern yellow pine, although 10 were of white pine. There was strong evidence through dendro-provenancing that the white pine used at Sherwood Forest originated in or near the state of Maine. The rest of the timber was probably obtained locally.

The oak timbers dated best, with 39 out of 65 timbers dating, representing a 60% success rate. The pine on the other hand was less successful, with 53% of the 49 timbers dating. It was noted that those sites further north and west, such as Arcola and Spring Hill, had the best degree of cross-matching. Those areas with the worst dating potential were in the Tidewater region where the material from Surry County proved particularly difficult.

Despite these difficulties, the programme of research on the eight buildings was successful, with at least one precise felling date for each of the twelve phases identified and sampled. Nine new reference chronologies were produced – five of pine and four of oak. Some of these were of extensive length, with the longest pine chronology of 213 years coming from Four Square, spanning the years 1576-1788, with the longest oak chronology with 275 years coming from Arcola, spanning the years 1570-1844. The white pine chronology from Sherwood Forest was found to be 207 years long and spanned the years 1639-1845. This showed the importance of dendro-provenancing and demonstrated that timber was being imported some distance during this period.

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Table 1: Summary of Tree-Ring Dating

FOUR SQUARE PLANTATION SLAVE QUARTERS, ISLE OF WIGHT COUNTY, VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
Right-hand (West) cabin											
* **fsq1a1**	c	PISP	North doorpost	1595-1741			147	0.84	0.34	0.235	
* **fsq1a2**	c		ditto	1767-1788		C	22	0.35	0.17	0.395	Winter 1788/9
fsq2	c	PISP	South doorpost	-			40	2.54	1.09	0.215	
fsq3	c	PISP	South-west corner post	1576-1716			141	0.98	0.47	0.239	(Winter 1788/9)
fsq4	c	PISP	South-east corner post	1603-1788		C	186	0.76	0.31	0.249	Winter 1788/9
* **fsq34**			Same-tree mean of **fsq3** + **fsq4**	1576-1788		C	213	0.87	0.44	0.238	Winter 1788/9
fsq5	c	PISP	4th upstairs joist from south	-			55	2.81	1.26	0.195	
* **fsq6**	c	PISP	3rd upstairs joist from south	1725-1783			59	1.89	0.46	0.217	After 1783
fsq7a1	c	PISP	6th rafter from south on east side	-			79	1.39	0.64	0.248	
fsq7a2	c		ditto	-		C	6	1.05	0.13	0.110	
fsq8a	c	PISP	West wall-plate	-			108	1.25	1.23	0.287	
fsq8b	c		ditto	-		½C	40	0.50	0.30	0.307	
fsq8			Mean of **fsq8a** + **fsq8b**	-			109	1.24	1.23	0.269	
fsq9	c	PISP	2nd stud from west on south end	-			63	1.69	0.76	0.267	
*** = FSQx1 Site Master**				**1576-1788**			**213**	**1.00**	**0.42**	**0.219**	
Left-hand (East) cabin											
fsq11	c	QUAL	North-east corner post	-			65	1.42	0.58	0.184	
fsq12a	c	QUAL	North-west corner post	-			75	1.38	0.38	0.189	
fsq12b	c		ditto	-			81	1.43	0.35	0.161	
fsq12			Mean of **fsq12a** + **fsq12b**	-			81	1.41	0.33	0.164	
fsq13	c	QUAL	South-west corner post	-			84	1.35	0.48	0.227	
fsq14	c	PISP	1st upstairs joist from north	-		+5-10C NM	43	1.67	1.30	0.305	
fsq15	c	PISP	West brace north end	-			61	2.73	0.92	0.204	
fsq16a	c	PISP	1st joist from north ground floor	1747-1816			70	1.73	0.50	0.262	
fsq16b	c		ditto	1746-1829		C	84	1.88	0.53	0.243	
† **fsq16**			Mean of **fsq16a** + **fsq16b**	1746-1829		C	84	1.82	0.49	0.252	Winter 1829/30
† **fsq17**	c	PISP	2nd joist from north ground floor	1728-1786			59	2.19	0.68	0.196	
† = FSQx2 Site Master				**1728-1829**			**102**	**1.98**	**0.65**	**0.225**	
FSQx3 Site Master			**Mean of fsq11 + fsq12 + fsq13**	**-**			**87**	**1.41**	**0.41**	**0.172**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity; QUAL = *Quercus Alba* (White oak), PISP = *Pinus L.* (Southern yellow pine)

ARCOLA SLAVE QUARTERS, LOUDOUN COUNTY, VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
West Duplex											
* **arc1**	c	QURU	3rd ceiling joist from west	1744-1812		¼C	69	1.40	0.37	0.150	Spring 1813
* **arc2**	c	QURU	4th ceiling joist from west	1747-1802			56	1.46	0.60	0.186	
arc3a1	c	QURU	5th ceiling joist from west	-			27	1.72	0.38	0.191	
arc3a2	c		ditto	-		7¼C	34	1.80	0.31	0.183	
arc4a	c	QURU	7th rafter from west on south side	1745-1797		+10 NM	53	1.00	0.30	0.228	
arc4b	c		ditto	1765-1802		+9 NM	38	0.88	0.24	0.222	
* **arc4**			Mean of **arc4a** + **arc4b**	1745-1802		+9 NM	58	0.95	0.28	0.220	After 1811
arc5a	c	QURU	7th ceiling joist from west	1742-1785			44	1.71	0.32	0.147	
arc5b	c		ditto	1778-1812		¼C	35	1.58	0.55	0.252	Spring 1813
* **arc6**	c	QURU	8th ceiling joist from west	1755-1812		¼C	58	1.69	0.38	0.180	Spring 1813
arc7	c	QURU	10th ceiling joist from west	1704-1793			90	1.35	0.56	0.249	
arc8	c	QURU	11th ceiling joist from west	-		12¼C	95	0.96	0.53	0.153	
* **arc9**	c	QURU	East door inner lintel	1732-1811		C	80	1.07	0.28	0.186	Winter 1811/12
* **arc10**	c	QURU	Stud to north side of east end window	1570-1754			185	0.46	0.11	0.160	
East Duplex											
arc11a	c	QURU	1st ceiling joist from west	1795-1833			39	1.51	0.20	0.129	
arc11b	c		ditto	1770-1835			66	1.31	0.36	0.223	
* **arc12**	c	QURU	4th ceiling joist from west	1763-1844		C	82	0.77	0.34	0.134	Winter 1844/5
* **arc13**	c	QURU	5th ceiling joist from west	1732-1842			111	0.73	0.21	0.204	
* **arc14**	c	QUAL	6th ceiling joist from west	1677-1844		C	168	0.67	0.22	0.244	Winter 1844/5
arc15a1	c	QUAL	7th ceiling joist from west, north side	1726-1823			98	0.65	0.23	0.222	
arc15a2	c		ditto	-		C	22	0.70	0.11	0.178	(Winter 1844/5)
arc16	c	QUAL	4th ceiling joist from west, south side	1722-1844		C	123	0.65	0.23	0.206	Winter 1844/5
arc17	c	QURU	8th ceiling joist from west	-		C	72	1.05	0.44	0.161	
* **arc18**	c	QURU	10th ceiling joist from west	1726-1844		C	119	0.72	0.34	0.171	Winter 1844/5
arc19	c	QURU	12th ceiling joist from west	-			71	1.34	0.30	0.134	
* **arc20**	c	QUAL	14th ceiling joist from west	1764-1844		C	81	1.33	0.38	0.195	Winter 1844/5
* **arc156**			Same-tree mean of **arc15a1** + **arc16**	1722-1844		C	123	0.66	0.22	0.196	Winter 1844/5
*** = ARC Site Master**				**1570-1844**			**275**	**0.67**	**0.27**	**0.166**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity; QUAL = *Quercus Alba* (White oak), QURU = *Q Rubra* (Red oak)

WALNUT VALLEY PLANTATION CABIN, SURRY COUNTY., VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
* **wvy1**	c	QUAL	NW corner post	1700-1815		20C	116	0.81	0.24	0.129	Winter 1815/16
* **wvy2**	c	QUAL	NW corner downbrace (N wall)	1665-1803		20	139	0.92	0.40	0.157	After 1803
wvy3a	c	QUAL	W door post (N door)	1668-1801		3	134	0.75	0.28	0.161	
wvy3b	c		ditto	1666-1812		15+3C NM	147	0.76	0.39	0.160	Winter 1815/16
* **wvy3**			Mean of **wvy3a** + **wvy3b**	1666-1812		15+3C NM	147	0.76	0.32	0.140	
wvy4a	c	QUAL	S chimney post	-		14+16C NM	126	0.64	0.33	0.171	
wvy4b	c		ditto	-		29C	109	0.69	0.48	0.180	
wvy4			Mean of **wvy4a** + **wvy4b**	-		29C	142	0.71	0.47	0.167	
wvy5a1	c	QUAL	SE corner downbrace (E wall)	-		1	120	0.82	0.39	0.137	
wvy5a2	c		ditto	-		+16¼C	16	1.12	0.25	0.113	
wvy6	c	QUAL	SE corner downbrace (S wall)	-			172	0.81	0.28	0.155	
wvy7a1	c	QUAL	SW corner post	1654-1690			37	1.06	0.49	0.250	
wvy7a2	c		ditto	1685-1814		51¼C	130	0.65	0.24	0.152	
wvy7b	c		ditto	1654-1718			65	0.59	0.19	0.224	
* **wvy7**			Mean of **wvy7a1** + **wvy7a2** + **wvy7b**	1654-1814		51¼C	161	0.68	0.28	0.169	Spring 1815
wvy8a	c	QUAL	SW corner downbrace (W wall)	-			116	0.64	0.31	0.182	
* **wvy8b**	c		ditto	1733-1813		11	81	0.93	0.34	0.187	After 1813
wvy9	c	QUAL	Top door hinge, garret partition door	-		C	66	1.07	0.23	0.158	
wvy10	c	QUAL	Bottom door hinge, garret partition door	-		C	66	1.01	0.22	0.147	
wvy910			Same-tree mean of **wvy9** + **wvy10**	-		C	66	1.04	0.22	0.147	
*** = WVY Site Master**				**1654-1815**			**162**	**0.82**	**0.26**	**0.125**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity; QUAL = *Quercus Alba* (White oak), QURU = *Q Rubra* (Red oak),

BACON'S CASTLE, SLAVE QUARTERS, SURRY COUNTY, VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
Left-hand side											
bac1	c	PISP	Front LH principal rafter	-			41	2.48	1.11	0.248	
bac2	c	PISP	Front rafter 12th from left	-			68	1.49	0.96	0.268	
bac3	c	PISP	Rear rafter 12th from left	-			46	2.55	1.09	0.247	
bac4	c	PISP	Front rafter 13th from left	-			47	2.62	0.69	0.189	
* **bac5**	c	PISP	10th joist from left	1747-1807			61	2.10	0.63	0.217	After 1807
bac6a	c	PISP	11th joist from left	1730-1786			57	3.16	0.83	0.178	
bac6b	c		ditto	1749-1788			40	2.54	0.74	0.194	
* **bac6**			Mean of **bac6a** + **bac6b**	1730-1788			59	3.06	0.90	0.177	After 1788
* **bac7**	c	PISP	12th joist from left	1760-1828		C	69	1.90	0.65	0.188	Winter 1828/9
Right-hand extension											
bac11	c	PISP	Rear rafter 16th from left	-			100	1.08	0.63	0.175	
bac12	c	PISP	Front rafter 16th from left	-		C	74	1.14	0.24	0.179	
bac13	c	PISP	Rear rafter 17th from left	-			60	1.77	0.61	0.169	
bac14	c	PISP	1st rear stud in extension	-			93	1.12	0.43	0.231	
bac15	c	PISP	Rear wall-plate	-			33	2.73	0.60	0.183	
bac16	c	PISP	Post right-hand end of 2nd phase	-		C	96	0.90	0.99	0.254	
bac17	c	PISP	2nd front stud in extension	-			37	1.39	0.35	0.271	
* **bac18**	c	PISP	1st joist in 2nd phase	1772-1842			71	1.24	0.95	0.256	After 1843
bac19a	c	PISP	5th joist in 2nd phase	1773-1845			73	1.14	0.87	0.278	
bac19b	c		ditto	1811-1847		C	37	0.54	0.22	0.314	
* **bac19**			Mean of **bac19a** + **bac19b**	1773-1847		C	75	1.12	0.87	0.286	Winter 1847/8
bac123			Mean of **bac1** + **bac2** + **bac3**	-			72	1.85	1.16	0.206	
*** = BAC Site Master**				**1730-1847**			**118**	**1.95**	**1.25**	**0.192**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity; PISP = *Pinus L.* (Southern yellow pine)

BEN LOMAND HISTORIC SITE, 10321 SUDLEY MANOR DRIVE, MANASSAS, PRINCE WILLIAM COUNTY., VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
* **blv1**	c	QUAL	5th floor joist from north	1767-1833	1819	14C	67	1.36	0.40	0.193	Winter 1833/4
blv2a	c	QUAL	6th floor joist from north	1766-1811			46	1.80	0.47	0.213	
blv2b	c		ditto	1790-1833	1819	14C	44	1.53	0.32	0.145	
* **blv2**			Mean of **blv2a** + **blv2b**	1766-1833	1819	14C	68	1.65	0.38	0.180	Winter 1833/4
* **blv3**	c	QUAL	7th floor joist from north	1735-1793			59	1.81	0.64	0.224	
* **blv4**	c	QUAL	9th floor joist from north	1758-1833	1819	14¼C	76	1.55	0.36	0.161	Spring 1834
* **blv5a**	c	QUAL	11th floor joist from north	1771-1827	1822	5	57	1.60	0.39	0.189	
blv5b	c		ditto	-		+12¼C	12	1.80	0.35	0.130	
* **blv6**	c	QUAL	5th rafter from north, west side	1767-1822	1820	2	56	1.38	0.33	0.168	
* **blv7**	c	QUAL	11th rafter from north, west side	1761-1833	1824	9C	73	1.15	0.31	0.180	Winter 1833/4
* **blv8**	c	QUAL	9th rafter from north, east side	1758-1833	1821	12C	76	1.34	0.33	0.161	Winter 1833/4
blv9a	c	QUAL	7th rafter from north, east side	-		5+6¼C NM	33	1.67	0.54	0.171	
blv9b	c		ditto	-		+10¼C	10	1.87	0.27	0.102	
*** = BLV Site Master**				**1735-1833**			**99**	**1.62**	**0.51**	**0.156**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ϴ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity; QUAL = *Quercus Alba* (White oak),

LOGAN FARM SLAVE CABIN, IVOR, ISLE OF WIGHT COUNTY, VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
lgn1	c	PISP	East post north end	-			38	2.33	0.70	0.221	
* **lgn2**	c	PISP	East brace north end	1703-1784			82	1.76	1.09	0.267	*c*. 1838
lgn3	c	PISP	North-east corner post	-		C?	122	1.25	0.76	0.274	
lgn4a	c	PISP	North brace east wall	-			85	1.59	1.19	0.224	
lgn4b1	c		ditto	-			36	2.13	1.03	0.234	
lgn4b2	c		ditto	-			13	0.71	0.19	0.226	
lgn4b3	c		ditto	-			13	0.71	0.23	0.323	
lgn4			Mean of **lgn4a** + **4b1** + **b2** + **b3**	-			85	1.61	1.21	0.221	
lgn5a	c	PISP	1st stud north of centre wall, west side	1725-1822			98	0.92	0.56	0.257	
lgn5b	s		ditto	1764-1837		C	74	0.63	0.24	0.245	
lgn5			Mean of **lgn5a** + **lgn5b**	1725-1837		C	113	0.90	0.52	0.243	Winter 1837/8
lgn6	c	PISP	4th ceiling joist from north	-			44	2.67	0.69	0.234	
lgn7	c	PISP	Centre stud north wall	1726-1826			101	0.97	0.61	0.266	(Winter 1837/8)
* **lgn8**	c	PISP	8th ceiling joist from north	1702-1785		C	84	1.81	0.89	0.269	Winter 1785/6
lgn9a1	c	PISP	South door post south door	1721-1759			39	2.41	0.67	0.203	
lgn9a2	c		ditto	1762-1785		C	24	1.21	0.36	0.278	
lgn9b1	c		ditto	1742-1774			33	1.81	0.55	0.227	
lgn9b2	c		ditto	-		C	9	1.01	0.31	0.268	
lgn9c1	c		ditto	1739-1756			18	2.16	0.31	0.115	
lgn9c2	c		ditto	1759-1785		C	27	1.24	0.39	0.253	
* **lgn9**			Mean of **lgn9a1** + **a2** + **b1** + **c1** + **c2**	1721-1785		C	65	1.94	0.79	0.221	Winter 1785/6
lgn10a	c	PISP	9th ceiling joist from north	1713-1756			41	2.91	1.19	0.268	
lgn10b	c		ditto	1715-1785		C	71	2.24	1.22	0.240	
* **lgn10**			Mean of **lgn10a** + **lgn10b**	1713-1785		C	73	2.28	1.23	0.250	Winter 1785/6
* **lgn57**			Same-tree mean of **lgn5** + **lgn7**	1725-1837			113	0.93	0.54	0.241	Winter 1837/8
*** = LGN Site Master**				**1702-1837**			**136**	**1.44**	**1.04**	**0.221**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity PISP = *Pinus L.* (Southern yellow pine)

SHERWOOD FOREST SLAVE QUARTERS, STAFFORD COUNTY, VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
* **shr1**	c	PIST	2nd rafter East side	1723-1822			100	0.86	0.35	0.185	
shr2a	c	PIST	4th rafter East side	1758-1845		C	88	0.88	0.33	0.152	
shr2b	c		ditto	1756-1845		C	90	0.87	0.31	0.148	
shr2			Mean of **shr2a** + **shr2b**	1756-1845		C	90	0.88	0.31	0.140	Winter 1845/6
* **shr3**	c	PIST	5th rafter East side	1694-1845		C	152	0.74	0.32	0.176	Winter 1845/6
shr4a	c	PIST	7th rafter East side	1732-1764			33	1.12	0.24	0.221	
shr4b	c		ditto	1700-1770			71	1.23	0.36	0.176	
* **shr4**			Mean of **shr4a** + **shr4b**	1700-1770			71	1.24	0.36	0.186	
shr5	c	PIST	5th stud centre wall	1754-1845		C	92	0.99	0.34	0.169	Winter 1845/6
* **shr6**	c	PIST	West stud centre wall	1712-1845		C	134	0.84	0.27	0.130	Winter 1845/6
shr7	c	PIST	11th rafter East side	-			65	0.57	0.30	0.286	
* **shr8**	c	PIST	11th rafter West side	1681-1801			121	0.99	0.44	0.187	
* **shr9**	c	PIST	13th rafter East side	1686-1833			148	0.60	0.37	0.189	
* **shr10**	c	PIST	18th rafter West side	1639-1771			133	0.75	0.22	0.141	
* **shr25**			Same-tree mean of **shr2** + **shr5**	1754-1845		C	92	0.94	0.31	0.149	Winter 1845/6
*** = SHR Site Master**				**1639-1845**			**207**	**0.86**	**0.25**	**0.128**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity PIST = *Pinus Strobus L.* (Eastern White pine)

SPRING HILL FARM SLAVE QUARTER, CULPEPER COUNTY, VIRGINIA

Sample number & type		Species	Timber and position	Dates AD spanning	H/S bdry	Sapwood complement	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges
* **spr1**	c	QURU	Rail on west elevation	1788-1857	1848	9C	70	1.67	0.39	0.199	Winter 1857/8
* **spr2**	c	QURU	West wall plate	1792-1857	1846	11C	66	1.70	0.74	0.148	Winter 1857/8
* **spr3**	c	QURU	Rail on south elevation	1789-1857	1843	14¼C	69	1.28	0.24	0.125	Spring 1858
* **spr4**	c	QURU	East wall plate	1766-1857	1844	13C	92	1.00	0.43	0.157	Winter 1857/8
spr5a1	c	QURU	North girt	1785-1807			23	2.85	0.82	0.251	
spr5a2	c	QURU	ditto	1808-1853			46	1.87	0.53	0.151	
spr5b	c	QURU	ditto	1809-1852			44	1.88	0.53	0.150	
spr5			Mean of **spr5a1** + **spr5a2** + **spr5b**	1785-1853			69	2.21	0.78	0.179	
spr6	c	QURU	Rafter 2E	1767-1857	1842	15C	91	1.31	0.33	0.155	Winter 1857/8
* **spr7**	c	QURU	Rafter 4E	1793-1857	1842	15C	65	1.01	0.25	0.121	Winter 1857/8
* **spr8**	c	QURU	Rafter 4W	1775-1857		C	83	1.20	0.25	0.117	Winter 1857/8
spr9a	c	QURU	Rafter 6E	1759-1846			88	1.19	0.19	0.138	
spr9b	c	QURU	ditto	1789-1857	1844	13½C	69	1.18	0.26	0.139	
spr9			Mean of **spr9a** + **spr9b**	1759-1857	1844	13C	99	1.18	0.22	0.135	Winter 1857/8
* **spr10**	c	QURU	Rafter 10E	1784-1857	1849	8C	74	1.40	0.47	0.144	Winter 1857/8
* **spr69**			Same-tree mean of **spr6** + **spr9**	1759-1857	1843	14C	99	1.25	0.25	0.136	
*** = SPR Site Master**				**1759-1857**			**99**	**1.26**	**0.23**	**0.118**	

Key: *, † = sample included in site-master(s); c = core; mc = micro-core; g = graticule; ⊖ = pith included in sample; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn, or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity; QUAL = *Quercus Alba* (White oak), QURU = *Q Rubra* (Red oak),

Explanation of terms used in Table 1

The summary table gives most of the salient results of the dendrochronological process. For ease in quickly referring to various types of information, these have all been presented in Table 1. The information includes the following categories:

Sample number: Generally, each site is given a two or three letter identifying prefix code, after which each timber is given an individual number. If a timber is sampled twice, or if two timbers were noted at time of sampling as having clearly originated from the same tree, then they are given suffixes '**a**', '**b**', etc. Where a core sample has broken, with no clear overlap between segments, these are differentiated by a further suffix '**1**', '**2**', etc.

Type shows whether the sample was from a core 'c', or a section or slice from a timber's'. Sometimes photographs are used 'p', or timbers measured *in situ* with a graticule 'g'.

Species gives the four-letter species code used by the International Tree-Ring Data Bank, at NOAA. These are identified in the key at the bottom of the table.

Timber and position column details each timber sampled along with a location reference. This will usually refer to a bay or truss number, or relate to compass points or to a reference drawing.

Dates AD spanning gives the first and last measured ring dates of the sequence (if dated),

H/S bdry is the date of the heartwood/sapwood transition or boundary (if identifiable).

Sapwood complement gives the number of sapwood rings, if identifiable. The tree starts growing in the spring during which time the earlywood is produced, also known also as spring growth. This consists of between one and three decreasing spring vessels and is noted as *Spring* felling and is indicated by a ¼ C after the number of sapwood ring count. Sometimes this can be more accurately pin-pointed to very early spring when just a few spring vessels are visible. After the spring growing season, the latewood or summer growth commences, and is differentiated from the proceeding spring growth by the dense band of tissue. This summer growth continues until just before the leaves drop, in about October. Trees felled during this period are noted as *summer* felled (½ C), but it is difficult to be too precise, as the width of the latewood can be variable, and it can be difficult to distinguish whether a tree stopped growing in autumn or *winter*. When the summer growth band is clearly complete, then the tree would have been felled during the dormant winter period, as shown by a single C. Sometimes a sample will clearly have complete sapwood, but due either to slight abrasion at the point of coring, or extremely narrow growth rings, it is impossible to determine the season of felling.

Number of rings: The total number of measured rings included in the samples analysed.

Mean ring width: This, simply put, is the sum total of all the individual ring widths, divided by the number of rings, giving an average ring width for the series.

Mean sensitivity: A statistic measuring the mean percentage, or relative, change from each measured yearly ring value to the next; that is, the average relative difference from one ring width to the next, calculated by dividing the absolute value of the differences between each pair of measurements by the average of the paired measurements, then averaging the quotients for all pairs in the tree-ring series (Fritts 1976). Sensitivity is a dendrochronological term referring to the presence of ring-width variability in the radial direction within a tree which indicates the growth response of a particular tree is "sensitive" to variations in climate, as opposed to complacency.

Standard deviation: The mean scatter of a population of numbers from the population mean. The square root of the variance, which is itself the square of the mean scatter of a statistical population of numbers from the population mean. (Fritts 1976).

Felling seasons and dates/date ranges is probably the most important column of the summary table. Here the actual felling dates and seasons are given for each dated sample (if complete sapwood is present). Sometimes it will be noticed that often the precise felling dates will vary within several years of each other. Unless there is supporting archaeological evidence suggesting different phases, all this would indicate is either stockpiling of timber, or of trees which have been felled or died at varying times but not cut up until the commencement of the particular building operations in question. When presented with varying precise felling dates, one should always take the *latest* date for the structure under study, and it is likely that construction will have been completed for ordinary vernacular buildings within twelve or eighteen months from this latest felling date (Miles 1997).

Table 2: Matrix of *t*-values and overlaps for same-timber means and site masters

Components of timber **fsq8**

Sample:	**fsq8b**
Last ring date AD:	
fsq8a	8.79 / 39

Components of timber **fsq12**

Sample:	**fsq12b**
Last ring date AD:	
fsq12a	15.84 / 75

Components of timber **fsq16**

Sample:	**fsq16b**
Last ring date AD:	1829
fsq16a	18.89 / 70

Components of same-tree mean **fsq34**

Sample:	**fsq4**
Last ring date AD:	1788
fsq3	12.02 / 114

Timber **arc4**

Sample:	**arc4b**
Last ring date AD:	1802
arc4a	8.18 / 33

Same-tree mean **arc156**

Sample:	**arc16**
Last ring date AD:	1844
arc15a1	13.44 / 98

Components of timber **wvy3**

Sample:	**wvy3b**
Last ring date AD:	1812
wvy3a	6.29 / 134

Components of timber **wvy4**

Sample:	**wvy4b**
Last ring date AD:	1815
wvy4a	5.82 / 93

Components of timber **wvy7**

Sample:	**wvy7a2**	**wvy7b**
Last ring date AD:	1814	1718
wvy7a1	0.00 / 6	7.45 / 37
	wvy7a2	5.36 / 34

Components of mean **wvy910**

Sample:	**wvy10**
Last ring date AD:	
wvy9	9.31 / 66

Components of timber **bac6**

Sample:	**bac6b**
Last ring date AD:	1788
bac6a	6.06 / 38

Components of timber **bac19**

Sample:	**bac19b**
Last ring date AD:	1075
bac19a	16.53 / 35

Components of mean **bac123**

Sample:	**bac2**	**bac3**
Last ring date AD:		
bac1	7.60	6.18
	37	36
bac2		3.55
		46

Components of mean **bac567**

Sample:	**bac6**	**bac7**
Last ring date AD:	1788	1828
bac5	7.39	6.67
	42	48
bac6		4.36
		29

Components of mean **bac189**

Sample:	**bac19**
Last ring date AD:	1847
bac18	7.19
	70

Components of timber **blv2**

Sample:	***blv2b***
Last ring date AD:	1833
blv2a	8.11
	22

Components of timber **lgn4**

Sample:	**lgn4b1**	**lgn4b2**	**lgn4b3**
Last ring date AD:	1780	1793	1808
lgn4a	17.51	4.90	3.79
	36	13	13
lgn4b1		0.00	0.00
		0	0
lgn4b2			0.00
			0

Components of timber **lgn5**

Sample:	**lgn5b**
Last ring date AD:	1837
lgn5a	9.82
	59

Components of timber **lgn9**

Sample:	**lgn9a2**	**lgn9b1**	**lgn9c1**	**lgn9c2**
Last ring date AD:	1785	1774	1756	1785
lgn9a1	0.00	7.72	9.16	0.00
	0	18	18	0
lgn9a2		9.62	0.00	14.26
		13	0	24
lgn9b1			5.74	11.15
			15	16

Components of timber **lgn10**

Sample:	**lgn10b**
Last ring date AD:	1785
lgn10a	17.50
	42

Components of same-tree mean **lgn57**

Sample:	**lgn7**
Last ring date AD:	1826
lgn5	14.25 / 101

Timber **shr2**

Sample:	**shr2b**
Last ring date AD:	1845
shr2a	8.79 / 88

Timber **shr4**

Sample:	**shr4b**
Last ring date AD:	1770
shr4a	9.46 / 33

Components of same-tree mean **shr25**

Sample:	**shr5**
Last ring date AD:	1845
shr2	14.20 / 90

Timber **spr5**

Sample:	**spr5b**
Last ring date AD:	1852
spr5a2	25.97 / 44

Timber **spr9**

Sample:	**spr9b**
Last ring date AD:	1857
spr9a	13.33 / 58

Components of same-tree mean **spr69**

Sample:	**spr9**
Last ring date AD:	1857
spr6	10.57 / 91

Components of site master **FSQx1**

Sample:	**fsq1a2**	**fsq34**	**fsq6**
Last ring date AD:	1788	1788	1783
fsq1a1	0.00 / 0	8.96 / 147	2.79 / 17
	fsq1a2	7.84 / 22	1.91 / 17
		fsq34	7.02 / 59

Components of site master **FSQx2**

Sample:	**fsq17**
Last ring date AD:	1786
fsq16	7.12 / 40

Components of site master **FSQx3**

Sample:	**fsq12**	**fsq13**
Last ring date AD:		
fsq11	4.24 / 59	3.43 / 62
	fsq12	7.17 / 81

Components of site master **ARC**

Sample:	**arc2**	**arc4**	**arc6**	**arc9**	**arc10**	**arc12**	**arc13**	**arc14**	**arc156**	**arc18**	**arc20**
Last ring date AD:	1802	1802	1812	1811	1754	1844	1842	1844	1844	1844	1844
arc1	2.53 56	3.93 58	5.57 58	4.35 68	2.14 11	2.79 50	3.94 69	3.79 69	1.44 69	2.87 69	2.90 49
	arc2	3.59 56	3.66 48	4.54 56	0.99 8	2.91 40	3.88 56	2.17 56	4.11 56	3.58 56	2.29 39
		arc4	2.62 48	3.38 58	0.00 10	3.57 40	4.76 58	4.12 58	2.39 58	2.98 58	2.55 39
			arc6	3.38 57	0.00 0	1.09 50	2.94 58	2.07 58	1.85 58	3.18 58	3.16 49
				arc9	5.54 23	1.56 49	4.71 80	5.06 80	3.68 80	4.78 80	2.90 48
					arc10	0.00 0	2.43 23	1.45 78	0.76 33	0.50 29	0.00 0
						arc12	3.81 80	5.32 82	3.36 82	1.27 82	3.24 81
							arc13	8.03 111	5.41 111	4.30 111	5.15 79
								arc14	6.13 123	4.80 119	6.32 81
									arc156	3.91 119	2.20 81
										arc18	3.33 81

Components of site master **WVY**

Sample:	**wvy2**	**wvy3**	**wvy7**	**wvy8b**
Last ring date AD:	1803	1812	1814	1813
wvy1	3.35	2.33	4.32	4.27
	104	113	115	81
	wvy2	1.73	3.35	1.98
		138	139	71
		wvy3	5.68	2.21
			147	80
			wvy7	2.90
				81
				wvy8b

Components of site master **BAC**

Sample:	**bac6**	**bac7**	**bac18**	**bac19**
Last ring date AD:	1788	1828	1842	1847
bac5	7.39	6.67	0.41	2.65
	42	48	36	35
	bac6	4.36	0.16	2.37
		29	17	16
		bac7	0.75	2.90
			57	56
			bac18	7.19
				70

Components of site master **BLV**

Sample:	**blv2**	**blv3**	**blv4**	**blv5a**	**blv6**	**blv7**	**blv8**
Last ring date AD:	1833	1793	1833	1827	1822	1833	1833
blv1	4.10 67	3.18 27	7.42 67	2.80 57	2.72 56	3.02 67	4.93 67
	blv2	8.36 28	6.70 68	4.60 57	5.68 56	4.60 68	5.14 68
		blv3	4.62 36	3.72 23	2.56 27	3.41 33	3.65 36
			blv4	4.22 57	4.65 56	4.71 73	5.36 76
				blv5a	3.68 52	3.71 57	3.82 57
					blv6	5.61 56	6.01 56
						blv7	6.72 73

Components of site master **LGN**

Sample:	**lgn8**	**lgn9**	**lgn10**	**lgn57**
Last ring date AD:	1785	1785	1785	1837
lgn2	7.56 82	3.84 64	7.42 72	4.55 60
	lgn8	4.84 65	9.76 73	3.32 61
		lgn9	5.38 65	3.74 61
			lgn10	2.89 61

Components of site master **SHR**

Sample:	**shr3**	**shr4**	**shr6**	**shr8**	**shr9**	**shr10**	**shr25**
Last ring date AD:	1845	1770	1845	1801	1833	1771	1845
shr1	5.56 100	3.17 48	3.56 100	2.64 79	1.51 100	0.00 49	3.70 69
	shr3	4.73 71	3.69 134	2.77 108	2.29 140	1.84 78	6.18 92
		shr4	4.90 59	4.08 71	5.21 71	4.33 71	4.06 17
			shr6	3.73 90	3.06 122	3.47 60	4.27 92
				shr8	3.80 116	2.51 91	2.09 48
					shr9	4.37 86	2.38 80
						shr10	3.24 18

Components of site master **SPR**

Sample:	**spr2**	**spr3**	**spr4**	**spr7**	**spr8**	**spr10**	**spr69**
Last ring date AD:	1857	1857	1857	1857	1857	1857	1857
spr1	7.72 66	3.56 69	5.20 70	3.51 65	3.69 70	2.13 70	6.80 70
	spr2	4.57 66	5.39 66	3.26 65	3.26 66	5.81 66	5.40 66
		spr3	3.59 69	4.76 65	1.99 69	2.73 69	6.32 69
			spr4	1.65 65	2.71 83	1.66 74	4.22 92
				spr7	5.74 65	3.60 65	10.12 65
					spr8	3.28 74	8.68 83
						spr10	3.78 74

Table 3: Dating of site master **FSQx1** (1576-1788) against reference chronologies at 1788

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Shenandoah National Park	(World Data Bank)	**VA014**	1612-1981	177	3.74
North Carolina	Tanner House Henderson	*(Miles and Worthington in prep)*	TNR	1671-1818	118	3.81
Pennsylvania	Spruce Glen	(World Data Bank)	PA012	1488-2001	177	4.09
Virginia	Falling Creek Ironworks VA	(Worthington and Miles 2007)	Fct1	1563-1700	124	4.61
Massachusetts	The Lindens Danvers MA	*(Miles and Worthington in prep)*	LVNx1	1577-1724	148	4.81
Virginia	Cofecha Dating Master WVVA DAT PINE	(Columbia unpubl)	**WVVAP**	1400-2001	175	4.83
Virginia	St John's Church Richmond	*(Miles and Worthington in prep)*	SJC	1556-1849	213	5.28

Table 3: Dating of site master **FSQx2** (1728-1829) against reference chronologies at 1829

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Piedmont Oak + Historical	*(Columbia pers comm)*	**PIEDMONT**	1488-2001	102	4.35
Virginia	Mount Fair, Albemarle County	(Miles and Worthington 2008)	HQFx8	1705-1848	102	4.51
Virginia	St John's Church Richmond	*(Miles and Worthington in prep)*	SJC	1556-1849	102	4.70
Virginia	Nottoway River	(World Data Bank)	VA025	1171-1984	102	5.23
Virginia	Logan Farm Slave Cabin	(Miles and Worthington in prep)	LGN	1702-1837	102	6.03
Virginia	Bacon's Castle Slave Quarters	*(Miles and Worthington 2009)*	BAC	1730-1847	100	6.60
Virginia	Blackwater River TADI	(World Data Bank)	VA021	932-1985	102	6.86

Table 3: Dating of site master **ARC** (1570-1844) against reference chronologies at 1844

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Spring Hill Farm Slave Quarter	(Miles and Worthington 2009)	SPR	1759-1857	86	6.54
Virginia	Hanover Tavern	(Columbia unpubl)	WATCH	1595-1981	250	6.61
Maryland	Josiah Henson Site ("Uncle Tom's Cabin")	(Miles and Worthington in prep)	UTCx1	1742-1849	103	6.66
Virginia	Piedmont Master Oak + Historical QUSP	(Columbia unpubl)	**PIEDMONT**	1488-2001	275	6.71
Virginia	Watchdog Massenhutten Mountain	(Columbia unpubl)	WATVA	1642-1981	203	6.87
Virginia	Virginia Master Chronology	*(Worthington 2008)*	**VA2008X**	932-2005	275	7.04
Virginia	Ben Lomand Historic Site	*(Miles and Worthington 2009)*	BLV	1735-1833	99	7.93

Chronologies in **bold** denote regional masters

Table 3: Dating of site master **arc7** (1704-1793) against reference chronologies at 1793

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Maryland	Doughoregan Manor Site Master	Oxford forthcoming	DRN	1536-1834	90	4.09
Virginia	Old Mansion, Bowling Green	*(Miles and Worthington unpubl)*	OMBx1	1570-1790	87	4.03
Virginia	Mt Vernon Mansion	Oxford forthcoming	mtvx5	1567-1777	74	4.03
Virginia	Arcola Slave Quarters, Loudoun County	(Miles and Worthington 2009)	ARC	1570-1844	90	4.63

Table 3: Dating of site master **arc5b** (1778-1812) against reference chronologies at 1812

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
New York	New York Mohonk	(Columbia unpubl)	NY	1449-1987	35	3.70
New York	Mohonk Lake Chestnut	(Columbia unpubl)	MOLNY	1659-1987	35	3.73
Virginia	Virginia Master Chronology	*(Worthington 2008)*	**VA2008X**	932-2005	35	3.80
Virginia	Watch Dog	(Columbia unpubl)	WATCH2	1642-1981	35	3.81
Virginia	Rubush Hunting Cabin Headquarters Farm Crozet Albemarle Co	(Miles and Worthington *2008*)	HQFx5	1661-1851	35	4.15
Virginia	Arcola Slave Quarters, Loudoun County	(Miles and Worthington 2009)	ARC	1570-1844	35	5.87

Chronologies in **bold** denote regional masters

Table 3: Dating of site master **arc5b** (1742-1785) against reference chronologies at 1785

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Massachusetts	Smith Healey House 1350 North St Walpole Norfolk MA	(Miles and Worthington in prep)	wlp	1674-1796	44	3.87
Virginia	Headquarters Farmhouse Crozet Albemarle Co	(Miles and Worthington *2008*)	HQFx1	1630-1836	44	3.94
North Carolina	Hoggatt House Highpoint Museum NC	(Miles and Worthington *2008*)	HMHx2	1744-1840	42	3.97
Virginia	Rubush Hunting Cabin Headquarters Farm Crozet Albemarle Co	(Miles and Worthington *2008*)	HQFx5	1661-1851	44	4.11
North Carolina	Hoskins Cabin NC (H G-M)	(Henderson et al 2009)	HOS	1723-1813	44	4.48
North Carolina	Hoggatt House Highpoint Museum NC	(Miles and Worthington *2008*)	HMHx1	1593-1823	44	4.59

Table 3: Dating of site master **arc11b** (1770-1835) against reference chronologies at 1835

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
New York	Palisades House	(Columbia unpubl)	phny	1469-1737	66	3.69
Massachusetts	Tuttle House, Ipswich – Phase 1	(Miles *et al* 2002)	ITH	1495-1670	66	3.93
New Hampshire	Gilman Garrison House Exeter	(Miles *et al* 2003)	ggh28	1533-1667	66	4.00
Massachusetts	The Old Castle, Pigeon Cove, Rockport	(Miles 2004)	OCP	1563-1710	66	4.27
Massachusetts	Fairbanks House, Dedham – Red Oak	(Miles *et al* 2002)	FHDX	1546-1654	66	6.01
Massachusetts	Fairbanks House, Dedham – Phase 2	(Miles *et al* 2002)	FHD-2	1546-1654	66	8.49

Table 3: Dating of site master **WVY** (1654-1815) against reference chronologies at 1815

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
New Jersey	Hutchingson Forest	(World Data Bank)	**NJ001**	1620-1982	162	4.87
Virginia	Blackriver River	(World Data Bank)	VA021	932-1985	162	5.02
	Mount Vernon Mansion and Estate	*(Miles and Worthington???)*	mtvx6	1678-1758	81	5.08
Virginia	Mount Fair, Albemarle County	*(Miles and Worthington 2008)*	HQFx10	1704-1840	112	5.27
Virginia	Eyre Hall, Cheriton,	(Miles and Worthington 2003)	EYREHALL	1514-1806	153	5.38
Virginia	Virginia Master Chronology	(Worthington 2008)	**VA2008x**	932-2005	162	5.51
Virginia	Gloucester Goal and Tavern	*(Miles and Worthington in prep)*	GLOx1	1702-1823	114	7.76

Chronologies in **bold** denote regional masters

Table 3: Dating of site master **BAC** (1730-1847) against reference chronologies at 1847

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Arcola Slave Quarters, Loudoun County	(Miles and Worthington 2009)	ARC	1570-1844	115	4.12
Virginia	Mount Fair, Albemarle County	(Miles and Worthington 2008)	HQFx9	1695-1835	106	4.34
Virginia	Mount Fair, Albemarle County	(Miles and Worthington 2008)	HQFx8	1705-1848	118	5.72
Virginia	Logan Farm Slave Cabin, Ivor, Isle Of Wight County	*(Miles and Worthington 2009)*	LGN	1702-1837	108	6.19
Virginia	Four Square Plantation Slave Quarters, Isle of Wight County	*(Miles and Worthington 2009)*	FSQx2	1728-1829	100	6.60
Virginia	Black water River	(World Data Bank)	VA021	932-1985	118	6.69
Virginia	St John's Church Richmond	*(Miles and Worthington in prep)*	SJC	1556-1849	118	8.91

Table 3: Dating of site master **BLV** (1735-1833) against reference chronologies at 1833

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Mount Fair, Albemarle County	(Miles and Worthington 2008)	**HQFx8**	1705-1848	99	5.87
Virginia	Browns Cove Site Master (oak), Albemarle County	(Miles and Worthington 2008)	HQFx	1571-1872	99	6.02
Virginia	Gloucester Goal and Tavern	(Miles and Worthington *in prep*)	GLOx1	1702-1823	89	6.06
Virginia	Hanover Tavern	(Columbia unpubl)	WATCH	1595-1981	99	6.50
Virginia	Yates Schoolhouse (Demolished) Headquarters Farm Crozet Albemarle VA	(Miles and Worthington *2008*)	HQFx2	1643-1815	81	7.52
VIrginia	Arcola Slave Quarters, Loudoun County	(Miles and Worthington 2009)	ARC	1570-1844	99	7.93
Virginia	Virginia Master Chronology	*(Worthington 2008)*	**VA2008X**	932-2005	99	7.94

Chronologies in **bold** denote regional masters

Table 3: Dating of site master **LGN** (1702-1837) against reference chronologies at 1837

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Piedmont Oak + Historical	*(Columbia pers comm)*	**PIEDMONT**	1488-2001	136	4.22
Pennsilvania	Moon Williamson House Bucks County	*(Columbia pers comm)*	MWHPY	1693-1781	80	4.29
North Carolina	Tanner House Henderson NC	(Miles and Worthington in prep)	TNR	1671-1818	117	4.39
Virginia	Blackwater River	(World Data Bank)	VA021	932-1985	136	4.76
VIrginia	St John's Church Richmond	*(Miles and Worthington in prep)*	SJC	1556-1849	136	5.67
Virginia	Four Square Plantation Slave Quarters, Isle of Wight County	(Miles and Worthington 2009)	FSQx2	1728-1829	102	6.03
Virginia	Bacon's Castle, Slave Quarters, Surrey County	(Miles and Worthington 2009)	BAC	1730-1847	108	6.19

Chronologies in **bold** denote regional masters

Table 3: Dating of site master **SHR** (1639-1845) against reference chronologies at 1845

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Maine	Traveler Mountain	(World Data Bank)	ME025	1728-1976	118	4.56
Maine	Elephant Mountain	(World Data Bank)	ME026	1667-1977	179	4.86
Maine	Ironbound Mountain	(World Data Bank)	ME017	1665-1982	181	4.86
Maine	Ironbound Mountain	(World Data Bank)	ME018	1665-1982	181	4.94
Maine	Grandfather Mountain	(World Data Bank)	NH003	1610-1979	207	5.35
Maine	Hamlin Ridge MT Katahdin	(World Data Bank)	ME016	1610-1981	207	7.12
Maine	Wizard Pond	(World Data Bank)	ME024	1692-1982	154	9.29

Table 3: Dating of site master **SPR** (1759-1857) against reference chronologies at 1857

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Arcola Slave Quarters, Loudoun County	*(Miles and Worthington 2009)*	ARC	1570-1844	86	6.54
Virginia	Piedmont Oak + Historical	*(Columbia pers comm)*	**PIEDMONT**	1488-2001	99	6.70
Virginia	Yates Schoolhouse (Demolished) Headquarters Farm, Crozet, Albemarle County	*(Miles and Worthington 2009)*	HQFx2	1643-1815	57	7.02
Virginia	Hay House Headquarters Farm Crozet Albemarle County	*(Miles and Worthington 2009)*	HQFx4	1715-1872	99	7.54
Virginia	Virginia Master Chronology	*(Worthington 2008)*	**VA2008X**	932-2005	99	7.84
Virginia	Browns Cove Site Master (oak), Albemarle County	(Miles and Worthington 2008)	HQFx	1571-1872	99	8.11
Virginia	Spring Hill Farm Slave Quarter Culpeper Co VA	(Miles and Worthington 2009)	spr5	1785-1853	69	8.60

Table 3: Dating of site master **spr5** (1785-1853) against reference chronologies at 1853

County or region:	*Chronology name:*	*Short publication reference:*	*File name:*	*Spanning:*	*Overlap:*	t-*value:*
Virginia	Browns Cove Site Master (oak), Albemarle County	(Miles and Worthington 2008)	HQFx	1571-1872	69	4.32
Virginia	Piedmont Oak + Historical	*(Columbia pers comm)*	**PIEDMONT**	1488-2001	69	4.62
Virginia	Hay House Headquarters Farm Crozet Albemarle Co VA	(Miles and Worthington *2008*)	HQFx4	1715-1872	69	5.62
Virginia	Virginia Master Chronology	*(Worthington 2008)*	**VA2008X**	932-2005	69	5.96
Virginia	Spring Hill Farm Slave Quarter Culpeper Co VA	(Miles and Worthington 2009)	SPR	1759-1857	69	8.60

Chronologies in **bold** denote regional masters

Bar diagram showing dated timbers in chronological position