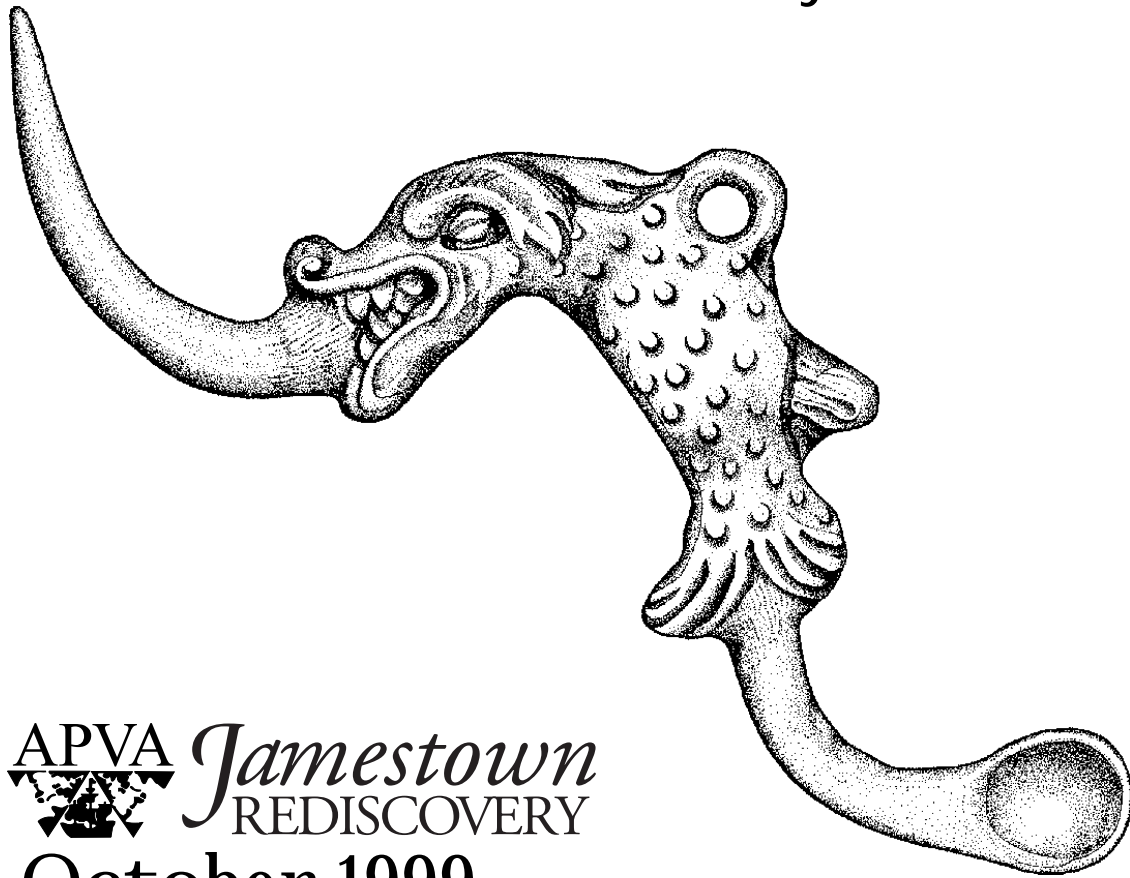


# 1998 Interim Report

on the APVA Excavations at Jamestown, Virginia

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APVA *Jamestown*  
REDISCOVERY  
October 1999

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# ACKNOWLEDGMENTS

The 1998 archaeological research was guided by Dr. William M. Kelso, Director of Archaeology for the Association for the Preservation of Virginia Antiquities (APVA). The field crew consisted of full-time APVA archaeologists Nicholas Lucchetti, Jamie May, Eric Deetz, and Seth Mallios. *Jamestown Rediscovery* veteran field assistants Martha Gates, Camille Hedrick, Thaddeus Pardue, and Danny Schmidt comprised the summer staff along with UVA doctoral student Heather Lapham. Dutch archaeological student Ranjith Jayasena volunteered for 6 weeks on the excavations and archaeologist Taft Kiser contributed many hours of field work. For the third consecutive year, the summer field school was managed by Seth Mallios and Garrett Fesler.

The full-time laboratory staff was headed by curator Beverly Straube and chief conservator/information technologist Elliott Jordan. Conservator Michael Lavin also handled photographic duties. Many volunteers assisted in the washing, sorting, and numbering of artifacts. These include Mac White, Emily Barbee, Ann Patterson, Harvey Patterson, Paul Rider, Suzanne Doley, Nancy Grieve, Phyllis Jennings, Gean Crane, Nan Papageorge, Alynne Pilch, Bill Wilhelm, Bob Vitarelli, Fritz Mueller, Christa Mueller, Phil DuPriest, Corinne Behen, and Gary Rast.

Funding for the 1998 year was provided by the Virginia General Assembly, the National Endowment for the Humanities, the National Geographic Society, and branches of the APVA.



Figure 1. Archaeological site plan through 1998

# INTRODUCTION

Nineteen ninety-eight was the 5<sup>th</sup> fieldwork season of the APVA's *Jamestown Rediscovery* archaeological project. The principal discoveries of the 1997 field season consisted of tracking the palisade slot trench for the east wall of James Fort, the excavation of Pit 3 (a probable magazine) located within the east bulwark, uncovering a palisade slot trench extending out from James Fort that may have enclosed James Town, exposing part of an early pit, excavation of a second early burial within the fort trace, and uncovering the foundations of part of a large, elaborate building related to the New Town development during second quarter of the 17<sup>th</sup> century.<sup>1</sup> These discoveries guided the 1998 field season to expand the open area excavations eastward

across the suspected James Town enclosure and the New Town building. The majority of the 1998 field season was devoted to excavating two major features, Structure 165 which was filled in c.1610 and Structure 163 which was built c.1640 and destroyed c.1650. Most of the project area, with the exception of some of the iron-fenced churchyard, had been farmed in the past, resulting in an overall stratigraphy of a plowzone layer above subsoil. Some limited areas contained remnants of an old topsoil layer below the plowzone. As in all previous field seasons, plowzone was removed in 10' squares and screened through ¼" wire mesh. A plowzone soil chemistry sample was taken from each 10' square.



# 1998 EXCAVATIONS

## James Fort

The only area of the triangular James Fort that was investigated in 1998 was the re-excavation of a 1938 utility trench west of the southwest corner of the iron-fenced church yard. This work is described in the Probable Burials section of this report.

## Structure 165 (JR158) & Possible Outwork Features

### Structure 165

The southwestern corner of this feature was unearthed in 1997. Structure 165, which consisted of a cellar hole and associated postholes, was completely uncovered and one-half of the cellar was excavated during the 1998 field season. At the subsoil surface, Structure 165's cellar hole measured 25' long and 13' wide through the center with an 11' by 7' wing off the southwest corner and a 5'3" by 3'6" wing off the northwest corner. The cellar fill had

been cut by two shallow trenches: a utility trench containing an iron pipe, and a narrow drainage ditch.

The west half of the cellar was excavated, leaving a continuous north-south profile. In addition, east-west profiles were maintained through the center of the main body of the cellar and through the southwest wing to the main north-south profile. Flotation samples (minimum of 10 liters) were taken from most layers, as well as a flotation column and a phytolith column from the center of the cellar (identical flotation and phytolith columns were collected from Pit 1 and Pit 3). Also, a 4' wide by 8" thick by 3' high section of intact fill, or monolith, was removed and curated.

Although the cellar was excavated in more than 50 separate contexts, the numerous distinct layers represented 4 major episodes of filling: occupation accumulations on the floor when the cellar was open, intentional filling with redeposited subsoil, intentional filling with contemporary refuse, and surface layers contaminated with later deposits. Most of the cellar floor was covered with a 2"-3" thick layer of compact white and orange sand that was composed of numerous thin laminations of sand wash (JR158BP). This layer extended across the floor to

*Figure 2. Photo of Structure 165 with west half excavated.*





a point about 4'6" short of the north wall and it also was not present in the southwest wing. The laminated sands were produced by water getting into the cellar and each lamination represents a separate water event. A similar layer of white and orange sand (JR158BG), but mixed and without any laminations, covered the cellar floor at the north end and sealed JR158BP. The 2 layers had mostly Native American ceramics and few European artifacts. JR158BP yielded 34 sherds of prehistoric pottery, 1 Martincamp flask sherd, 1 coarseware sherd, 1 delftware drug jar sherd, and 2 tobacco pipe stems while JR158BG contained 27 sherds of Native American pottery, 1 coarseware sherd, 1 tobacco pipe stem, and 1 jetton.

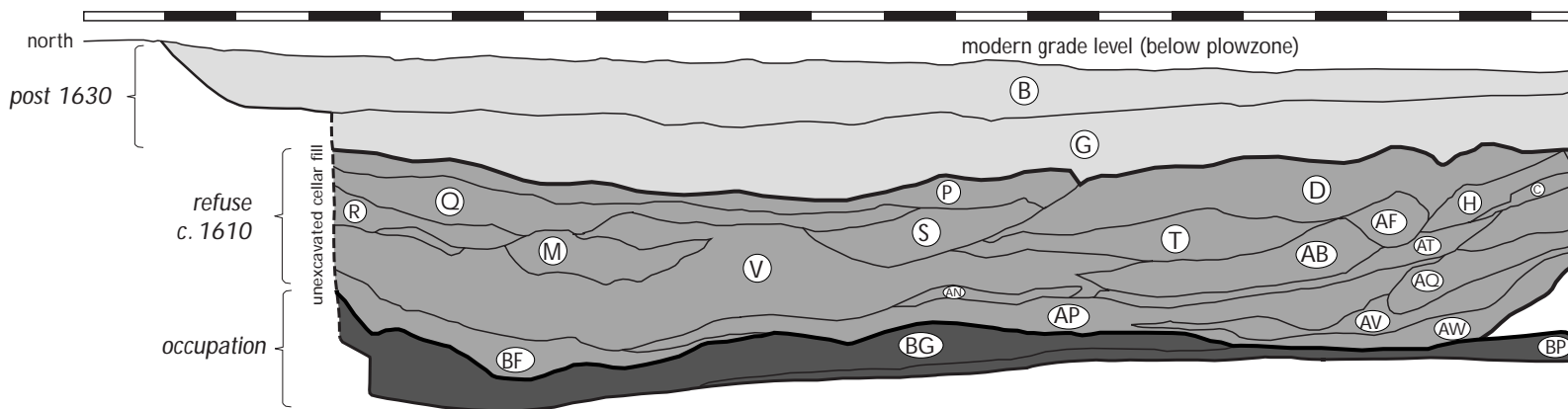
Above the compact sand layers on the floor of the cellar was a deliberate backfill of yellow and white clay mottled with grey sandy loam. This material clearly was dumped into Structure 165's cellar from the south and extended about 8' to the north. The clay backfills (JR158AA, BM) were among the most voluminous layers in the cellar, but not surprisingly, they contained comparatively few European artifacts. JR158BM had no artifacts at all. JR158AA had 362 artifacts, but of these there were only 49 sherds of European ceramics. The rest of the finds consisted of 78 faunal remains, 5 oyster shells, and 227 sherds of prehistoric pottery. These layers were redeposited subsoil mixed with some topsoil, apparently the result of digging into subsoil nearby and getting rid of the spoil by discarding it into the abandoned cellar. The large percentage of prehistoric pottery in the fill indicates it came from an area that was little disturbed by the Jamestown settlers at the time.

The principal fill in the rectangular core of the cellar incorporated many ash and loam layers (JR158S, D, H, N, T, V, AB, AP, AQ, AV, BF, and

AW) that contained large quantities of oyster shells, bones, and other artifacts. Most of these deposits were discrete dumps of refuse. However, layer JR158AP was more than a single episode of filling. Its appearance in the main north-south profile is deceiving since JR158AP diminished as it approached the center of the cellar. JR158AP was composed of a dark brown/black loam with a dense concentration of oyster shells and sturgeon bone. It was deposited into the cellar from the west side where it was thickest along the west wall of the cellar and then sloped down and thinned toward the center of the cellar. It contained more than 4 times the number of finds (n=25122) than any other layer in the cellar. The top-ranking artifact-bearing layers by total number of artifacts in Structure 165's cellar are 158AP, N (n=6214), D (n=3599), V (n=2964), and R (n=2359). The earliest dated artifact, a silver sixpence with the date 1573, came from JR158BF which was a well-mixed layer of roughly equal amounts of orange clay and brown loam that covered the 3<sup>rd</sup> and 4<sup>th</sup> steps of the cellar entrance and sealed layer JR158BG. Although cataloguing of finds from Structure 165 is incomplete at this time, the work to date indicates that JR158AP contains more than 40% of the total number of artifacts from Structure 165.

A homogeneous stratum of very sandy brown loam with few brick bits (JR158G) covered JR158D. JR158G was a horizontal layer that averaged 9"-12" in thickness and filled nearly the entire cellar except the south end where it thinned and stopped about 3' from the south edge of the cellar. Although it yielded a large quantity of artifacts (n=1905) that were mostly of the same type as the underlying layers, JR158G did contain a number of artifacts that dated its deposition to post-1630 including 10 sherds of earthenware produced by the

Figure 3. North-south profile through Structure 165.



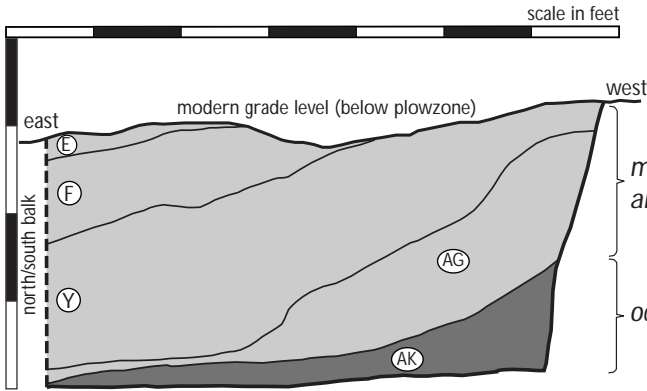
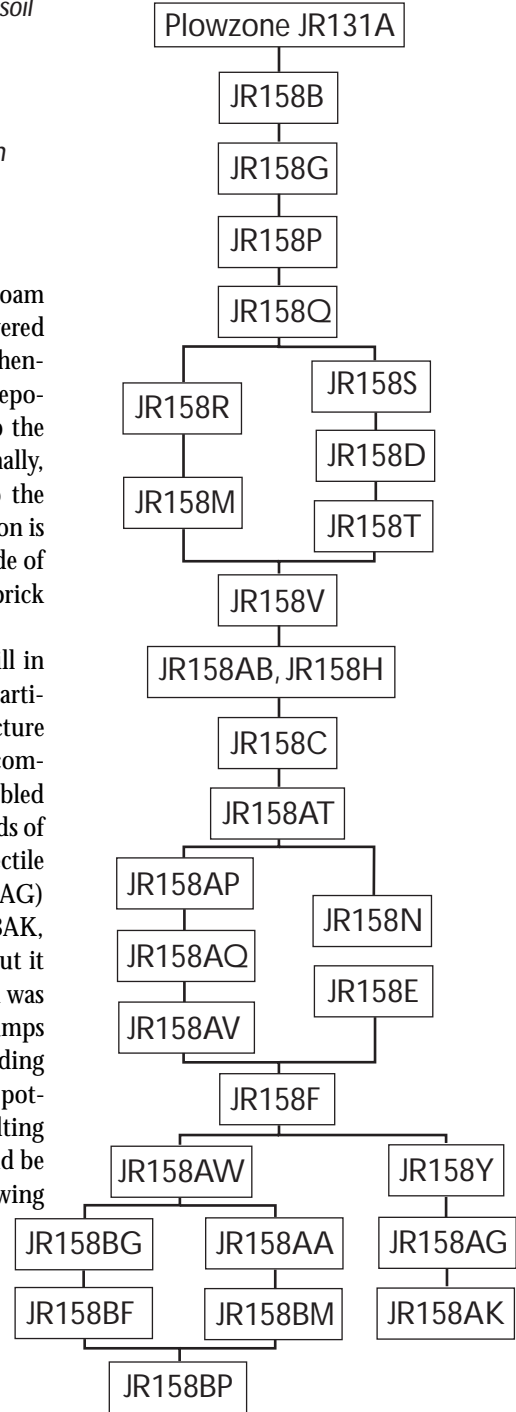


Figure 4. East-west profile through southwest wing of Structure 165.

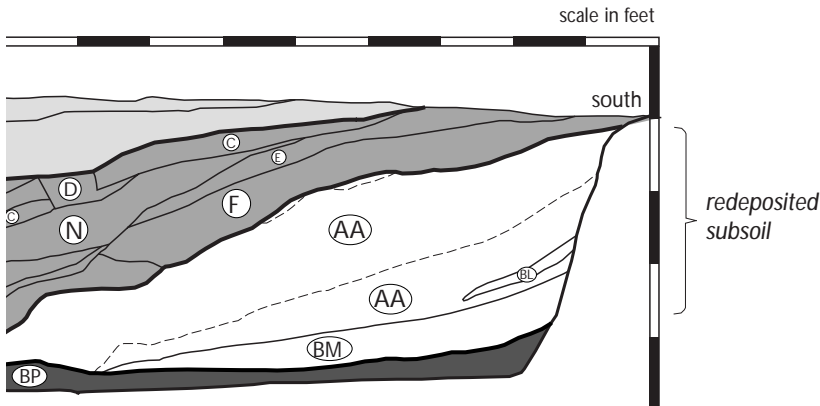
“Jamestown potter”. Above this was JR158B, a layer of brown loam with chunks of yellow clay and a heavy scatter of brick that covered most of the surface of the pit. In addition to the Jamestown earthenware, it produced 17 fragments of wine bottle glass, dating its deposition to post-1650. It likely was a plowzone soil that filled up the cellar after the original backfill had compacted and subsided. Finally, there was a post-1650 deposit (JR158J) that was confined to the north end of the cellar and sealed JR158B. JR158J (its designation is out of sequence since it was not found until much of the west side of the cellar was already excavated) had a heavy concentration of brick bats and coal.

The fill in the southwest wing was markedly different the fill in the core of the pit (Figure 4), most notable was the absence of artifact-rich, ashy loam deposits that filled the main body of Structure 165’s cellar. The floor of the wing was covered with a layer of compacted, laminated white and orange sand (JR158AK) that resembled JR158BP. It washed in from the west side and contained 54 sherds of Native American pottery, 1 sherd of Martincamp flask, 1 projectile point, and 1 bone. A sizable layer of grey/brown sand (JR158AG) also washed in from the west side on top of JR158AK. Like JR158AK, it had a large amount of Native American pottery, 52 sherds, but it also contained 41 sherds of European pottery. Sealing JR158AK was a thick layer of dark grey very sandy loam with many fist-sized lumps of yellow clay (JR158Y). It yielded almost 900 artifacts including 210 sherds of Native American pottery; a variety of European pottery, largely delftware drug jars and pieces of crucibles and melting pots; and a 4” copper square pierced in one corner so that it could be worn as a pendant. None of these layers extended beyond the wing

Figure 5. Modified Harris matrix of Structure 165.



Note: JR158AF, AN, and BG were not included in the matrix because they were considered insignificant deposits.



into the rectangular core of the pit. JR158Y was sealed by layers JR158E and F which were present in the main north-south profile of the pit.

The excavation revealed that the rectangular core of Structure 165's cellar had vertical walls on the west, north, and south, and a flat floor. The floor of the cellar was 4'7" below subsoil, which added to the thickness of the overlying plowzone, resulted in a cellar that minimally was 5'6" deep below grade at the time it was built. It originally could have been even deeper since it was dug on the slope of a hill and the grade likely was altered by erosion during the 18<sup>th</sup> and 19<sup>th</sup> centuries when it was cultivated. The rougher and gently sloping side walls of the southwest wing were noticeably different than the smooth vertical walls of the rectangular core. The wing off the northwest corner proved to be the main entrance into the cellar where a set of steps had been cut into the subsoil. The entrance consisted of a 5-step stairway that descended west-to-east to a landing, then made a 90 degree turn to the south with 1 final step down to the cellar floor. The space where the stairway adjoined the cellar was 3' wide.

An area of scorched subsoil was found slightly south of center at the base of the west wall. It consisted of a 3" high by 1' long patch of red-baked clay with a thin line of scorched clay trailing off on either side to an overall length of 1'6". Associated with the scorched clay was a 2'4" by 4'0" thin layer of charcoal and daub bits (JR158BZ) that covered the cellar floor in front of the scorched clay. This may have been produced by an extremely crude hearth. There are no architectural features along the

west side of the cellar for a corresponding chimney.

Since the Structure 165 cellar has not been completely excavated, only a general overview of the artifacts assemblage will be presented. A simple layout of the ceramics shows that delftware drug jars were the most numerous vessel type followed by Bartmann bottles, Spanish olive jars, and Martincamps flasks. Border ware is rarely found on European sites in North America and then in only very small quantities. Border ware forms from Structure 165 include dishes, candlesticks, pipkins, costrels, skillets, and jars. Other finds include glass beads, Irish coins, jettons, copper scrap and ornaments, fish hooks, bandolier cylinders, tasset lames, bullet molds, matchlock lockplates, triggers and trigger guards, belt hooks, gorgets, musket rests, rapier blades, sword guards, a halberd, spade nosings, and sturgeon bone.

### Associated Features: Possible Palisade and Possible Post Structure

An auxiliary palisade slot trench (JR140-144) extending out perpendicular from the south corner of the east wall of James Fort was uncovered in 1997 (see Figure 1). The palisade slot trench, which had very distinct postmolds in it, was about 1' wide and 1' deep below subsoil, and stopped 4' from Structure 165 where it terminated at a small posthole.<sup>2</sup> In 1998, a test trench (JR165) was excavated 4' from the east side of Structure 165 to see if the palisade continued along the same line. There was no indi-

Figure 6. Range of ceramic types recovered from Structure 165 excluding the later deposits of JR158B, G, and J

Red Border ware	Midlands Purple	West Somerset
delftware	Beauvais	East Somerset
Dutch coarseware	Verwood	North Devon plain
Spanish costrel	Frechen stoneware	Raeren stoneware
Spanish holloware	Martincamp flask	Spanish majolica
Spanish olive jar	Merida jug	Dutch faience
Essex Post-Medieval Blackware	London Post-Medieval Redware	Portuguese faience
Essex Post-Medieval Fine Redware	London Post-Medieval Slipped Red and Green	refractory clay vessels (both crucibles and melting pots)
Chinese porcelain	North Italian	



Figure 7. Detail photo of steps into Pit 4.

cation of the palisade in JR165.

A narrow trench was found that appeared to be contemporary with the auxiliary palisade and Structure 165. The trench (JR195) was parallel to the long axis of Structure 165 and perpendicular to the east end of the auxiliary palisade where it may have formed a 6' wide gate. A 2' long section of the 1'3" wide trench was trowel-cleaned and excavated. The trench was only 2" deep below subsoil and there was no evidence of postmolds, either in the test section or the rest of the trench. The absence of any discernable postmolds in JR195 and its shallowness are in sharp contrast to the obvious postmolds and depth of the auxiliary palisade slot trench.

Immediately off the north end of Structure 165 is a vaguely rectangular pattern of postholes that perhaps formed some kind of structure adjacent to or adjoining Structure 165. Just outside the north edge of Structure 165's cellar are 3 postholes in a line at 8' intervals. There is a second parallel line of postholes 12' further north, however they do not form matching pairs with the postholes in the first line. The postholes had not excavated at the time of this report.

## Dating and Interpretation

The artifact assemblage from Structure 165, just as in Pit 3 and Pit 1, suggests they all were filled in at the same time, about 1610, while the profusion of weapons and armor also reinforces the emerging assessment that Jamestown was established on a deep-seated military foundation. All 3 features contained the same ceramic types as well as an abun-

dance of military objects and copper scrap. And just like Pits 1 and 3, all the precisely datable objects from Structure 165 were manufactured before 1607. Ten dated coins were recovered from Structure 165; their dates are 1573, 1591, 1601 (n=6), and 1602 (n=2). Structure 165 had 2 datable jettons including: a "Lion of St. Mark" Hans Krauwinkel jetton that was made c.1580-1586 and a "Franco-Allego" Hans Krauwinkel jetton made in 1589. In addition, Structure 165 yielded a "St. Michael slaying a dragon" Antwerp coin weight made 1558-1603 and 3 lead cloth seals, 1 made no later than 1602, and 2 made in 1603. The connections between Pits 1 and 3 and Structure 165 is further established by the extensive number of ceramic crossmends. Not only does each pit crossmend to the other two, but the crossmends are numerous and from deep sealed layers and not from upper layers where crossmends can produce erroneous associations (i.e. early midden washing into a depression in a later pit caused by compaction of the pit fill and resulting in a crossmend to earlier features).

There is a good chance that Structure 165's cellar was dug in 2 phases; the rectangular core first and the southwest wing second. The unsmoothed sloping side walls of the southwest wing infer that it was not constructed at the same time as the vertical walled rectangular core. The fact that the southwest wing lies south of the conjectural James Town palisade slot trench while the main body of Structure 165's cellar is north of the slot trench further suggests different periods of construction. Also, different periods of construction could explain the absence of JR158BP, the floor covering layer in the cellar core, in the southwest wing. It may be that the rectangular core was dug first with silt collecting on the floor and the wing added sometime after the silt layers had been deposited.

If Pits 1 and 3 and Structure 165 were abandoned and filled all at the same time, it is reasonable to assume that the changes were caused by major modifications to James Fort c.1610. Further, a redesign of such magnitude also implies that it was spawned by an event of equal consequence. There were two conspicuous events that occurred at that time that might have brought about the re-vamping of James Fort. The first is the arrival of Lord De La Warr, the first Lord Governor of Virginia, in the spring of 1610 and the second occasion was the replacement of Lord De La Warr in 1611 by Sir Thomas Dale. Thomas West, the third

Lord De La Warr, gained military experience in the Low Countries wars and later served on Queen Elizabeth's Privy Council.<sup>3</sup> When he arrived at Jamestown in June (the previous winter was the "Starving Time"), De La Warr found the place in a shambles and ordered a crew to "...cleanse the town," an action that aptly describes the filling of holes with refuse.<sup>4</sup>

Sir Thomas Dale was a professional soldier with long experience and wide renown who spent more than 7 years in Low Countries, many of those as captain of an infantry company. He arrived in May of 1611 as Deputy Governor, relieving George Percy who had been the interim Deputy Governor after De La Warr's departure from Jamestown in March of 1611.<sup>5</sup> Dale, famous for his implementation of martial law in the colony, also engaged in an extensive series of major new construction and renovation projects at Jamestown including (by Dale's account): repair of the church and the storehouse; construction of a stable, a munition house, a powder house, a new well, a sturgeon house, a blockhouse, a barn, and a bridge among other things.<sup>6</sup>

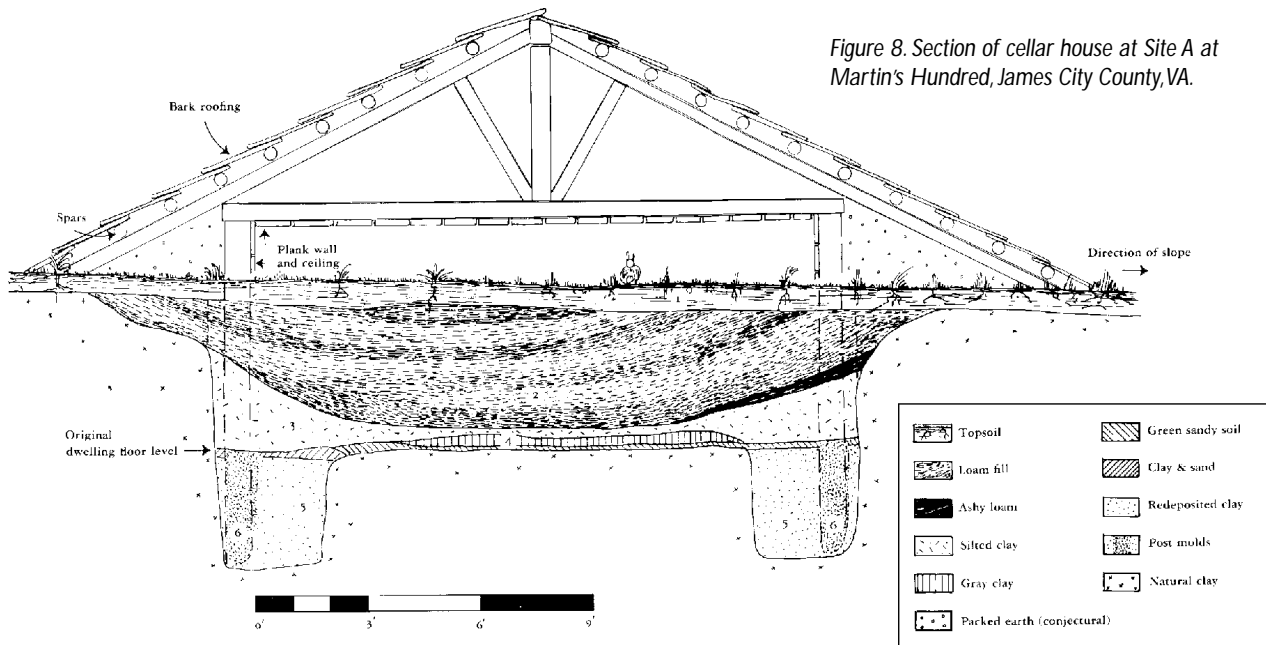
The form of Structure 165's cellar is distinctly different from Pits 1 and 3, and likely its function as well. Pit 1, save for a small rectangular component, was created by several episodes of digging, resulting in overlapping, irregularly-shaped, rough-sided holes in the ground, and it likely was a clay borrow pit. Pit 3 was a large circular hole with smooth sloping side walls and a flat floor that may have been a type of magazine that served the east bulwark. The rectangular plan, vertical sides, flat floor, and subsoil steps all indicate that the Structure 165 cellar was designed with architectural considerations for a specific purpose and carefully dug.

The edge of the pit at the surface of subsoil was not eroded, suggesting that it had been protected from the elements by a covering, most likely a roof of some form. There are postholes along the perimeter of Structure 165's cellar that may have supported such a cover. No postholes were detected in the floor of the cellar.

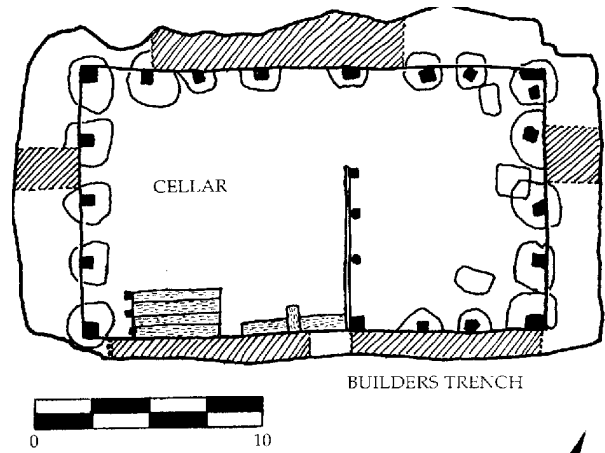
As a semi-subterranean structure, Structure 165 possibly was built as a dwelling, a storehouse, a defensive work, or as a dungeon. John Smith specifically mentioned a dungeon while describing an incident involving a stolen pistol and the incarceration of a hostage, "Yet the President pitying the poor naked savage in the dungeon sent him some victual and some charcoal for a fire."<sup>7</sup> When the pistol was returned, the English went to the dungeon to release the captive in the dungeon only to find him unconscious from smoke inhalation. This lack of adequate ventilation in the dungeon has led one researcher to suggest that it must have been an underground structure.<sup>8</sup>

Another type of subterranean structure was identified in a 1623 report that described the living conditions of the struggling colony in January of 1608 as:

"all utterly destitute of houses, not one as yet built, so that they lodged in cabins and holes in the ground."<sup>9</sup> In fact, 3 semi-subterranean dwellings or cellar houses have been found by Virginia archaeologists on sites dating to the first half of the 17<sup>th</sup> century, although these later cellar houses are not associated with impoverished or frontier sites. Ivor



Noel Hume excavated a cellar house at Site A at Martin's Hundred that dated to c.1635-1650.<sup>10</sup> The Site A cellar house was dug not quite 4' deep into the subsoil and measured 18' by 16'6". It had 6 large postholes that were connected by slots which held timber studs. The Site A cellar house had a flight of clay steps in the center of one of the gable ends, but there was no sign of a hearth or chimney base. Working under the direction of James Deetz, Ann Markell excavated a cellar house at site PG92 at Flowerdew Hundred.<sup>11</sup> The 1620's-1630's cellar house at PG92 was 16' by 20' and 4' deep into subsoil. The interior framing was attached to posts in holes spaced at 4' intervals around the bottom of the cellar. There was evidence of wooden stairs at one corner of the cellar, a wooden partition dividing the cellar into two unequal rooms, and indications of a brick chimney at one gable. The author, while working for the Virginia Department of Historic Resources, directed the salvage excavation of the 1630-1650 Boldrop Site in Denbigh.<sup>12</sup> The Boldrop cellar house was a 15' square earthfast building set into a 22' square and 2'6" deep hole. The frame had principal posts at the corners and midpoints of the walls with studs between the main posts. There was no evidence for an exterior cellar entrance nor a chimney base or hearth. Based on the shallowness of the cellar and the absence of a cellar entrance and chimney, the Boldrop cellar house seems to be a different type of structure from



44 PG 92

FEATURES 12 & 12 a

Figure 9. Plan of cellar house at PG92 at Flowerdew Hundred, Prince George County, VA.

the cellar houses at Site A and Flowerdew Hundred. One astute interpretation that has been offered is that the Boldrop cellar house represents an effort to construct a frame house with an English basement.<sup>13</sup> In contrast to Structure 165, these three examples all had postholes in the cellar floors to support either a superstructure and/or a wood lining along the cellar walls. Another difference between the cellar houses and Structure 165 is that at least two of the cellar houses had good evidence of a chimney base.

There are several references to storehouses at James Fort in contemporary accounts.<sup>14</sup> Unlike the descriptions of the "holes in the ground" dwellings and the dungeon, there is no hint that the store-

Figure 10. Photo of the cellar house at Boldrop, Newport News, VA.





Figure 11. 1608 Zuniga map depicting James Fort's possible rectangular watchtowers.

houses were partially underground, although the descriptions of the storehouses were very brief and without any details apart from size.

There is little precedent in 16<sup>th</sup>- or 17<sup>th</sup>-century English fortifications in Ireland or the Netherlands that suggests Structure 165 and the conjectural adjoining post building were defensive works such as watchtowers or outworks. Renaissance fortifications in Ireland and Europe were not built with separate, or attached, specially-designed structures that served as watchtowers. Nonetheless, William Strachey stated in 1610 that James Fort had “at every Angle or corner, where the lines meete, a Bulwarke or Watchtower is raised,”<sup>15</sup> and this comment has prompted many Jamestown researchers to interpret the rectangular projections depicted on the Zuniga map at the southeast and southwest corners of James Fort as watchtowers. Indeed, John Smith did illustrate a watchtower that was built on Bermuda.<sup>16</sup> One archaeologist has suggested that the James Fort watchtowers were New World adaptations necessitated by the guerrilla-style warfare practiced by the Powhatans.<sup>17</sup>

There is a similar lack of evidence to conclude that Structure 165 was some type of fortification. Outworks, sometimes called advanced works, were constructed outside the curtain walls (and defensive ditch if present) for several reasons: to control strategic ground, to force an enemy to attack at a greater distance, to cover areas that were obscured

to the fort walls, and to provide additional flanking fire. The only time specialized fortification features were built adjacent to the fort walls was to protect the defensive ditch and these were low structures so as not to obstruct the field of fire from neighboring bastions.<sup>18</sup>

## Structure 163 (JR100)

Excavation of the west half of Structure 163 during the 1997 field season revealed that its exterior dimensions were 30' by 50', that the west facade had one definite chimney base and another probable chimney base, and was built using cobble foundations. In 1998, the remainder of the Structure 163's interior squares on APVA property (roughly 10% of the building is on NPS property) were excavated. In addition, the NPS issued a permit to the APVA allowing the *Jamestown Rediscovery* team to excavate a 3'-wide trench on NPS property to expose the east side of the building footprint to determine whether it had additions, chimneys, porches, etc.

Beneath the plowzone, the stratigraphy of Structure 163 consisted of an upper layer of brown loam with brick bits (JR100A) that sealed a dense layer of whole bricks, brick bats and chunks, shell mortar, and very little soil (JR100C). The rubble layer in turn lay directly upon intact or fallen brickwork and the remains of a burned wooden floor (JR100D). Much of Structure 163's foundation had been salvaged and a robber's trench (JR100B) was present along the west side of the building. The fill in the north end of Structure 163 was quite different than the rest of the building. Below the plowzone was a large clinker deposit (JR100L) that contained several broken wine bottles whose shapes date to c.1770. The clinker cut into a thick layer of clay (JR100M) that extended from the north edge of the building to the north chimney base.

Much of the west half of Structure 163 has been excavated down to intact brickwork, fallen brickwork, and burned wooden floor. Structure 163 has two chimney bases on the west wall and the north chimney base is the best preserved. In fact, it looks as if the entire north chimney has toppled completely into the building, producing a jumbled but largely articulated chimney fall which eventually could provide important architectural information about Structure 163. There is another large section of wall (chimney?) fall in the southwest room of the building.



Figure 12. Overhead view of archaeological remains of Structure 163.

The north chimney base foundation is  $1\frac{1}{2}$  bricks wide with a 10"-12" trench around the outside that is filled with cobbles. The firebox is 4' deep and 8'6" wide. There are at least 4 courses of brick remaining in the north chimney base, while only the bottom course of one-half of the south chimney base survives. Most of the west foundation has been completely robbed of its cobbles. The vestige of brickwork in the south chimney base indicates that, unlike Structure 163's walls, the chimney foundations were constructed entirely of brick. The two chimney bases were built asymmetrically along the west wall and separated by a 12'6" wide gap. The distance between the north chimney base and the northwest corner of Structure 163 is 14' and this may represent an unheated room at one end of the building. The exposed part of the south gable foundation has most of its dry laid cobbles still in place. Also, a large burned timber in the center of the south

wall likely marks the location of a large door. This riverside entrance could be for loading goods.

The 3'-wide trench excavated along the east wall line of Structure 163 was devoid of any additional structural related features except for the southeast corner. Beginning at the northeast corner, the east wall line was manifested as a sharp straight line of dark brown loam cutting through yellow clay subsoil for a distance of 36'. The last 14' consisted of fill within what appears to be a perpendicular line at the 36' point, although it is difficult to know for sure due to the limited exposure in the 3' wide trench. It is possible that this fill may mark the location of a porch tower.

Significant architectural details can be gleaned from the archaeological evidence. The roof covering is suggested by the many pieces of broken pantile in the brick rubble while at least some of the rooms or hearths in the building had floors paved





Figure 13. Detail photo of north chimney base and chimney fall of Structure 163.

with brick tile. Wooden floors apparently were used in other rooms as seen in the charred floor boards and joists in the room in front of the south firebox. The large amounts of Dutch brick found concentrated in and around each chimney base implies that Structure 163 had some architectural embellishment.

### Dating and Interpretation

The charred wooden floor indicates that Structure 163 was destroyed by fire, while the excavation of an artifact-rich midden devoid of any wine bottle glass adjacent to the southwest corner of Structure 163 suggests that the mishap occurred before c.1650. The only other deposit that has been dug that conceivably might provide a destruction date is the burned floor layer. Part of it was excavated in front of the south chimney base, but no datable artifacts were found. There is documentary evidence that indicates that Structure 163 was built by a merchant, John White. A 1644 land patent to White certainly seems to describe the correct place on Jamestown Island:

*“Now Know yee that I Richard Kemp Esqre doe by thses presents According to ye Act of assembly*

*give grant and Confirm unto mr John White ‘one Acre of Land lyeing in James City bounded west upon the Church Yard East upon Land apprtaining to the State house North towards the Land of mr Thomas Hampton, and south upon James river the Length being Twenty three poles and the breadth seaven poles almost.’ To have and to hold the said one Acre...”<sup>19</sup>*

The terms of the patent also required White to construct a building within 6 months or lose the property. The fact that White was a merchant is mentioned in a 1649 land record which stated that “John White of James Parish in Virginia, merchant,” sold 1000 acres near the falls of the James River to Fleetwood Dormer.<sup>20</sup>

The archaeological findings are consistent with the historical information. The dating evidence from the midden confirms that a building was present during the time when documentary evidence reveals that a merchant owned the property, while the size and plan of Structure 163 unquestionably indicate that it was more than a large dwelling. In fact, the plan resembles contemporary English merchants’ houses that were a combination dwelling and warehouse. In sum, the evidence indicates that Structure 163 was a large, architecturally sophisticated (for early 17<sup>th</sup>-century Virginia), half-timbered building, likely a warehouse, that belonged to the New Town period at Jamestown.

## Human Burials

### Burial 3 (JR200)

A 5’ by 10’ unit (JR91) was excavated in the south church yard to trace the east wall palisade trench of James Fort and at least one unmarked human burial (JR200) was encountered. The burial, which was oriented east-west, cut into an undisturbed original topsoil layer at a depth of 1’3” below modern grade. It was sealed by two layers; an upper modern topsoil and root mat layer that covered a 9” thick layer with a heavy concentration of brick chunks and shell mortar (JR91A). A 2’ long section of the west end of the burial was tested to examine the preservation of the bone and also to determine the amount and types of artifacts in the grave fill for dating the interment. The individual had been buried in a wood coffin which had completely decomposed and the subsequent slumping of soil created a long shallow depression in the cen-

ter of the grave that eventually was filled-in by the overlying layer of brown sandy loam with brick bits (JR200A). The grave shaft originally was filled with sandy orange clay (JR200B) which was simply the redeposition of the subsoil that had been excavated to create the grave. Excavation of the burial was suspended when part of the skull was found. The bone was not crushed and was well preserved. The position of the skull at the west end indicates that it was a standard Christian burial. The undisturbed burial fill from the test section contained 6 artifacts: 1 sherd of London postmedieval redware, 2 small pieces of brick, 2 small pieces of clay tiles, and 1 quartzite flake. This artifact sample is insufficient to date the internment more precisely than post-1607.

There may be part of another grave with the same east-west alignment in the northeast corner of square JR91.

## Probable Burials

Archaeological preservation conditions toward the center of James Fort were investigated by mechanically removing the backfill in a 1938 utility trench that ran off the southwest corner of the church yard. A 30' long section of the 1938 trench was excavated first using a backhoe and then the trench side walls and bottom were trowel cleaned. There were 2 features in the bottom of the utility trench that almost certainly are burials (JR170, 171). The presence of several pieces of human bone in the trench backfill, undoubtedly the result of disturbing the burials during the installation of the utility trench, supports this presumption. The probable burials are oriented east-west.

A ten foot square (JR184) at the northeast corner of the excavation contained features that represent at least one, and possibly 2, burials. A neighboring square (JR183) also contains a possible burial.

## Dating and Interpretation

The sequence of human burials and the evolution of the Jamestown churches and related graveyard is a complicated and unsettled issue, and the following is a brief outline of the available evidence regarding the development of the Jamestown church and its graveyard. There is little debate that the first church built on the same location of the reconstructed church dates to no later than 1617, while some researchers have suggested that it might even date to 1610. There were at least 2 earlier wooden churches, and the Zuniga Map apparently indicates

that they were approximately in the center of James Fort. Sir George Yeardley, who died in 1627, is believed to be buried inside the church. The earliest documented burial in the graveyard is 1642-1649. The graveyard encompassed 1½ acres by 1690 and had a 260' long rail fence on north side of the church. The church was abandoned in 1750 and in the early 1790's John Ambler and William Lee built a brick wall, which is the same one that stands today, enclosing the graves of their families within about 1/7<sup>th</sup> of an acre. An APVA report made in 1902 on the church excavations stated that the cemetery, based on the presence of uncovered human burials, extended south to the river, west to the Confederate Fort, and within the brick wall to the north and east.<sup>21</sup>

The foundation of the 1617 Jamestown church was constructed following the customary east-west orientation. Burial 3, along with probable burials JR170, 171, and 184, also complied with the Christian tradition of east-west alignment. These stand in contrast to previously excavated burials JR102 and JR156. The latter two burials, thought to date to 1607 and 1608, respectively, were aligned to the river side wall of James Fort which runs northwest-southeast. Consequently, Burial 3 and probable burials JR170, 171, and 184 likely belong to the formal graveyard that grew around the more permanent 1617 (or possibly 1610) Jamestown church. The *Jamestown Rediscovery* excavations contradict the 1902 APVA report that indicated that the graveyard extended south to the river since no burials have been found south of burials JR102 and JR156. Further, there are no burials south of probable burial JR184, so it, along with probable burials JR170 and 171, may mark the southern extent of the Jamestown church graveyard.

## Ditch 6: Probable Property Line (JR136,137)

The 1998 field season continued to expose a zig-zag ditch (JR136, 137) that was first uncovered in 1997. A zig-zag ditch usually is related to a corresponding snake or worm fence which parallels the zig-zag ditch. Ditch 6 extends almost 110' north-south through the east side of the project area. It cuts through, from south to north, the following features: Pit 3, the bulwark trench, the possible fort extension palisade trench, and the possible out-

work palisade trench. The part of Ditch 6 north of the possible fort extension palisade line has not been excavated.

## Dating and Interpretation

Sections of Ditch 6 have been excavated in previous years. It has produced wine bottle glass, sherds of Jamestown coarseware and Westerwald chamberpot, and 2 white ball clay tobacco pipe bows marked with the initials “RG” and “WC”. These artifacts suggest that Ditch 6 was filled in post-1650.

It is very likely that Ditch 6 marked a 17<sup>th</sup>-century property line. It is plausible to suggest that the zig-zag trench marks the western boundary between John White’s property and the church yard. If this is correct, then it would be possible to determine the amount of erosion that has taken place since the 1644 patent stated that John White’s lot was 23 poles (379.5’) long and the south boundary is the James River. All that needs to be done is to trace the zig-zag ditch north to a corner to see how much of the 379.5’ survives.

### 17<sup>th</sup>-Century Fireplace or Kiln (JR215)

An enigmatic brick feature was uncovered about 20’ north of Structure 165 in squares JR182 and 183. Given its proximity to the church cemetery and other unmarked burials found by Jamestown Rediscovery excavations, this brick feature initially was considered as part of the foundation for a table top tomb or perhaps a remnant of a colonial church yard wall. Further excavation located definite corners of a 8’6” east-west foundation with three shorter sections of foundation extending north, resulting in an “E”-shaped feature. Therefore, this was not part of a wall. The north face of the east-west foundation was heavily burned, suggesting that the feature was a fireplace or possibly a small kiln.

The brickwork shows distinct evidence of two periods of construction. The 5’10” long and 1½ brick-wide east wall (cheek?) and part of the south wall are oriented to the cardinal directions. The south wall is clearly chopped through about 2’3” from the southeast corner, where a 2 brick-wide cheek and perpendicular wall were installed with a northeast-southwest alignment.

The are two large postholes at the southern corners of the feature and it is possible that this is an earthfast structure with a brick fireplace and a wood-and-clay chimney, although the heavily burned brick edges would seem to be the product of more in-

tense fires like those used in a kiln. JR215 does somewhat resemble Structure 27 that was excavated on NPS property in 1935. Broadly dating to the mid-17<sup>th</sup> century, Structure 27 was 6’3” by 5’6” with chambers on either side of a central firebox.<sup>22</sup> Its small size and the presence of waster tobacco pipes and possible kiln props, suggest that Structure 27 was a pipe kiln. No wasters have been found in the vicinity of JR215, however, it has not been completely excavated as of this report. Artifacts from the plowzone over and around JR215 indicate that it dates to the 17<sup>th</sup> century.

### Forge Pits 1 & 2 (JR167,168)

Two small clinker-filled pits about 2’ apart were found along the west edge of the southwest wing of Structure 165. Forge Pit 1 (JR167) consisted of two components; a square pit that was lined with brick along three sides with a small shallow pit adjoining the open side. The 10” by 1’ pit was about 4” deep and filled entirely with clean brown sand. The 1’3” square pit had one course of either stretcher or soldier bricks along three sides. The fill inside the brick-

Figure 14. Photo of Feature 215, a possible fireplace or kiln.





Figure 15. NPS Structure 27, a small kiln excavated in 1935.

lined pit was a dense concentration of clinker mixed with brown loam. Some of the clinker chunks were fist-sized and larger. The pit was removed intact, but while cutting back the east face, a distinct bowl-shaped depression was seen immediately below the brick lining.

Forge Pit 2 (JR168) measured about 2' in diameter. It has not been excavated at this time, however, its surface is filled primarily with clinker, coal, and ash with some iron artifacts mixed in and very little soil.

Currently, the only available dating evidence is that the construction Forge Pit 1 cut through the fill in Structure 165's cellar and therefore must date to post-1610.

### “T”-trenches 3 & 4

The two “T”-trenches found during the 1998 field season make a total of four such features located by the Jamestown Rediscovery excavations. All four trenches are aligned with their long legs, which range from 8'6” to 10'3”, parallel to the seawall. The perpendicular short legs, which measure 1'6” to 2'0”, extend toward the James River. So far, the only dating evidence for the trenches is that one “T” trench cuts through a chimney base in Structure 163, thereby dating it to post-1650. The trenches somewhat resemble 1781 Continental artillery footings that have been excavated at Yorktown. If the trenches are related to a gun or mortar battery, then they must date to either the Revolutionary War or the Civil War. The immediate vicinity of the Jamestown church was fortified during both conflicts.

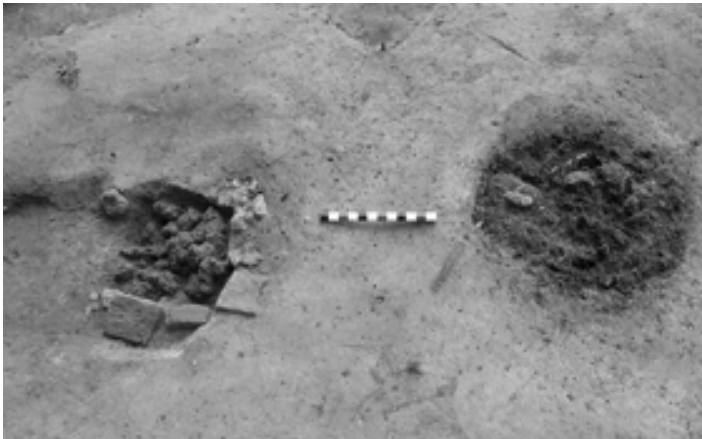


Figure 16. Photo of Forge Pits 1 & 2.

Figure 17. Profile photo of Forge Pit 2.



## Geological Studies

William and Mary geologists Drs. Gerald Johnson and Greg Hancock initiated two research projects at the James Fort site in 1998. Groundwater monitoring wells were installed to determine whether there are tidal oscillations in the groundwater beneath the site of James Fort, if the tidal oscillations pump brackish water into the groundwater system, and the effect of drought on the salinity of the groundwater. The second project was part of a continuing endeavor to ascertain the posi-

tion of the c.1607 shoreline. A transect of 5 vibracores was taken from the James River bottom at approximately 70' intervals. The transect originated from a point that was projected to be the location of the now lost west bulwark of James Fort and, therefore, a point that was dry land 400 years ago. The 350' vibracore has been analyzed and the 17' long core indicates that the southwestern shore of Jamestown Island could not have extended out this far in the early 17<sup>th</sup> century.<sup>23</sup> Scientific examination of the other vibracore tests is in progress.

# SELECTED ARTIFACTS

## Ear Picker

While full baths were not part of the daily routine for Englishmen of the 17<sup>th</sup> century and, in fact, were infrequent occurrences, other parts of the body received fastidious care. This is reflected in the range of cosmetic implements dating from this time period that were devised to shape the eyebrows and other facial hair and to clean the nails, teeth, and ears.<sup>24</sup>

One such cosmetic implement known in contemporary terms as an “ear picker” or “ear pick”<sup>25</sup> was excavated from the plowzone (Figure 1). As was the fashion for many of these tools, it is doubled ended, combining the function of an earscoop with that of a nail/tooth cleaner. These dual-purpose ear pickers are known in England from at least the late Iron Age<sup>26</sup> and were used into the 19<sup>th</sup> century.<sup>27</sup>

Randle Holme, chronicler of 17<sup>th</sup>-century material culture, describes an “eare picker” in 1688 as an instrument used “to cleanse the eares from waxe, which often causeth a Deafness in the part; the other end is used to cleanse the teeth.”<sup>28</sup> (Figure 2) The 17<sup>th</sup>-century English were knowledgeable of plaque, “a stone-like substance commonly called the scales or surf of the teeth,”<sup>29</sup> and were encouraged by medical professionals to use toothpicks frequently.

Ear pickers were also an integral part of the surgeon’s chest. Ivory ear pickers, bearing the name of an unknown Dr. Armitage,<sup>30</sup> were recovered from a medical chest that sank aboard the *Mary Rose* in 1545. London surgeon John Woodall, who sent a fully furnished surgeon’s chest to Jamestown in 1609, also mentions “eare-pickers” as part of the surgeon’s “necessary bundle of small Instruments

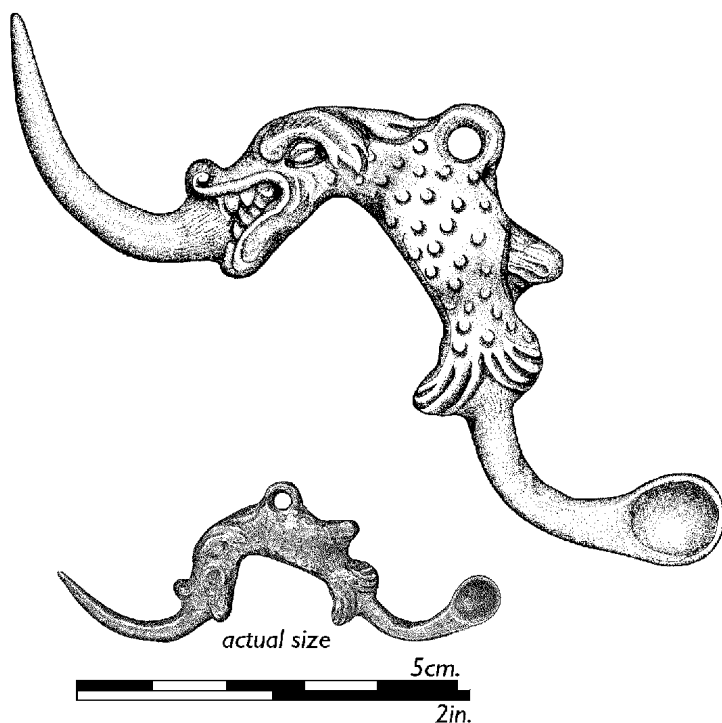


Figure 18. Drawing of silver ear picker in the shape of a sea rhinoceros recovered from the plowzone of James Fort.

Figure 19. Randle Holme’s drawing of an ear picker depicted on a page of medical tools and distillation equipment in his *Academy of Armory and Blazon*. Although the book was not published until 1688, Holme did the work for it in 1649.



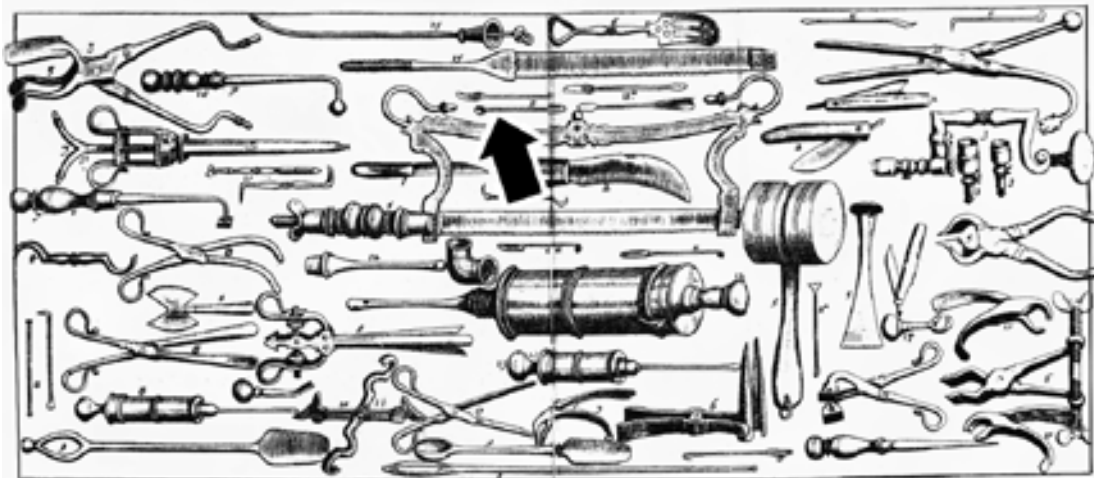


Figure 20. Tools for a surgeon's chest, including an ear picker, from John Woodall's *The Surgions Mate*, published in 1617.



Figure 21. Randle Holme's depiction of a sea rhinoceros which resembles the spotted, hump-backed and horned sea creature forming the ear picker from James Fort.



Figure 22. A silver ear picker excavated from a c. 1620-1635 context in Prince George County, Virginia. (PG300/152E-10, Virginia Department of Historic Resources)



usually brought from Germanie." These tools were needed for "casualties," such as "a stone in the eare," which "unfortunately happen on the sodaine."<sup>31</sup>

The ear picker from James Fort is an unusually ornate example. Unlike most known ear pickers, which are made of bone or base metal, it is composed of silver and has been cast in the form of a marine monster most closely resembling what was known as a "sea rhinoceros" or narwhal. Randall Holme describes the sea rhinoceros as a spotted and finned creature with dragon-like fins on the head, a sharp nose and teeth, a sharp-pointed hump on the back, and a horn at the end of the nose.<sup>32</sup>

The spotted excavated example grasps between its sharp teeth a round-sectioned nail/tooth cleaner, which curves out to a point like a giant tusk. Arching out from the creature's tail is a small scoop for cleaning the ears. A suspension loop for hanging the tool from a girdle, or possibly a chain about the neck, forms the hump at the top of the animal's back. The S-shaped object measures 57 mm in length.

Although many ear pickers have been excavated in England,<sup>33</sup> reflecting how important this tool was to daily hygiene, none of them parallel the complexity of design of the James Fort example. Two other seventeenth-century silver ear/tooth pickers

with a Virginia context are known—one from a probate inventory<sup>34</sup> and the other from excavation.<sup>35</sup> It is not possible to know the appearance of the inventoried object however the excavated example is not cast into a zoomorphic form. In addition, the nail/tooth cleaner end of the implement is sickle-shaped which appears to be a later development.<sup>36</sup>

With its sea creature motif, the ear picker from Jamestown dates to the late 16<sup>th</sup> or early 17<sup>th</sup> century. It undoubtedly belonged to one of the gentlemen at Jamestown, perhaps one who had spent many years adventuring on the sea. It must have been a very costly object at the time and would have been proudly displayed by the owner as representative of his status.

## Cloth Seals

Small leaden devices known as cloth seals were part of the European textile industry's system of industrial regulation and quality control between the 14<sup>th</sup> and 19<sup>th</sup> centuries. Manufacturers and finishers of cloth as well as merchants and tax officials once crimped these diminutive objects onto cloth as it moved through the various processes from loom to consumer.<sup>37</sup>

The most common type of cloth seal is two-part, consisting of a disc with a tapered rivet (disc 1) connected by a thin strip to a similarly sized disc with a central hole (disc 2). The seal is folded at the connecting strip over the edge of "fabric so that the rivet on one disc could be pushed through the fabric and the corresponding hole in the other disc."<sup>38</sup> The discs were sealed firmly over the cloth by being stamped with one, or between two, dies which impressed the discs with various numerals, letters, and/or decorative motifs.

Fourteen cloth seals were excavated from Structure 165. The various impressions upon the seals can provide a good deal of information beyond that of simply identifying the types of material the colonists were using. Status can be indicated as well as suggestions of trading patterns and practices. One of the seals (1216-JR), for instance, is an Elizabethan alnage seal impressed with the Tudor coat of arms. The alnager is the crown's official representative who insures that the proper taxes have been paid on the textile. This particular impression would not have been used beyond 1602, the year of Elizabeth's death, being at that time replaced by the symbols of James I. Since the Jamestown colony did

not start until 1607 this means that the textile must have been produced at least 5 years before it reached Virginia. This is a surprisingly long time for the fabric to be languishing about unused considering the high value of textiles in the 17<sup>th</sup> century. A lot of capital was tied up in the production and distribution of cloth and all indications are that textiles were sold and subsequently used soon after production.<sup>39</sup>

Another Elizabethan seal (1112-JR) appears to be from the county of Kent, which was a major producer of kersey and broadcloth during the late 16<sup>th</sup> and early 17<sup>th</sup> centuries (Figure 25). Broadcloth is a fine, traditional woolen textile used primarily for men's clothing in England from the 12<sup>th</sup> century. Virginia gentleman George Percy ordered "6 yardes of Broade Clothe for a Cloke a Jerkin and a paire of breeches" in 1610.<sup>40</sup>

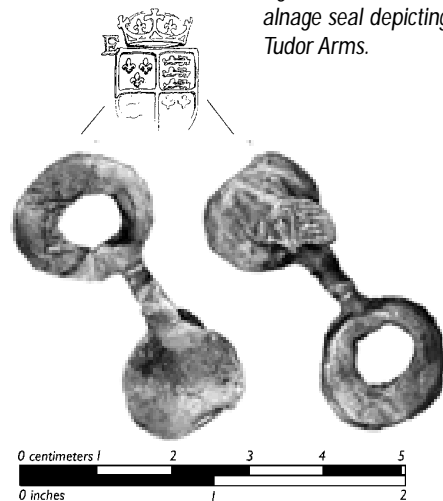


Figure 23. Elizabethan alnage seal depicting the Tudor Arms.

Figure 24. Elizabethan alnage seal with a crown over a seeded rose and ER to the side. The legend N.PAN.ERO.KENT identifies the seal with fabric from the English county of Kent.





A total of eight alnage seals dating to the period of Elizabeth's reign have been excavated during the *Jamestown Rediscovery* project (See Appendix I). One seal (520-JR) even bears a date of the 1590s although the last digit is obscured. The frequency of these early seals (19% of the entire cloth seal assemblage of 36) indicates a pattern of textile supply to the colony consisting of old stores of material. These supplies had perhaps been assembled for previous voyages of the merchant adventurers that abounded during Elizabeth's reign and continued under James. Possibly the goods were not used during the journey and were off-loaded at London on

the return voyage to be stored for another venture. A court minute from the East India Company dated September 1607 appears to substantiate this practice. It records "beads and **cloth very much moth eaten**, sold to the Governor Sir Thomas Smythe for £3.5s. for the Virginia Voyage."<sup>41</sup> The beads were clearly intended for the Indian trade, but was the cloth as well? Perhaps the English considered the Indians to be indiscriminating consumers who would accept fabric no matter what the condition. Or was Smythe trying to save his undercapitalized Virginia Company some money by clothing the colonists in hole-ridden textiles? Smythe, a highly successful London merchant had controlling interests in both the East India Company, of which he was governor, and the Virginia Company, of which he was the treasurer and the first chief executive. He would be aiding both organizations by buying up the unused supplies from one group that would be needed by the other. It is likely that the East India Company surplus is also the source of the inadequate tents of which John Smith complains.<sup>42</sup> The Virginia Company's pattern of supplying its colony with second rate goods seems to endure its tenure. As late as 1623 colonists are complaining that they are being "victualled wth mustie bred the reliques of former Vioages."<sup>43</sup>

Figure 25. Elizabethan alnage seal with crowned ER over a large central fleur de lis on disc two. Disc one bears a crowned I for James I.

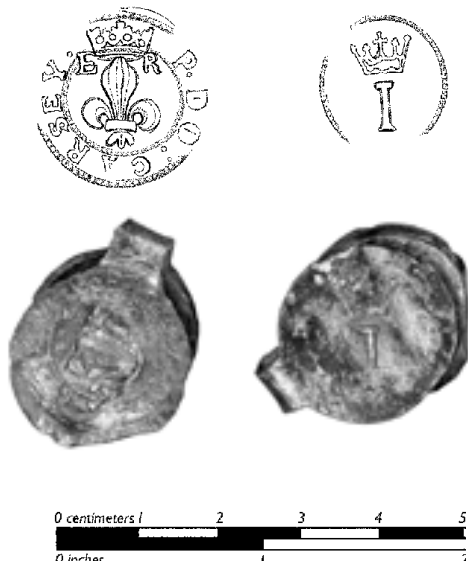
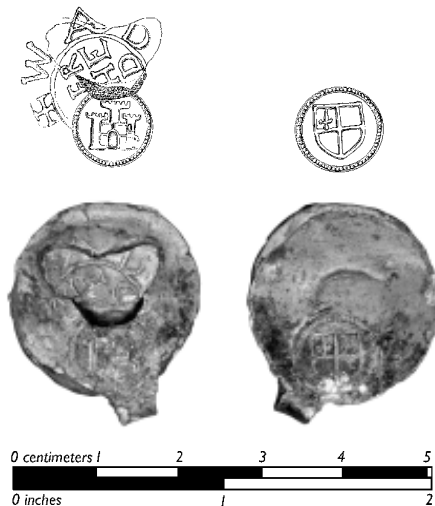


Figure 26. Alnage seal from London stamped with SEARCHED indicating that the cloth had been officially inspected.



The two other alnage seals from Structure 165 appear to be from the reign of James I. One (657-JR) is an Elizabethan seal which was validated in James' reign by the addition of a crowned I in a beaded cartouche. The seal contains the legend P. D O : C A R S E Y which probably was once attached to a twilled, narrow woolen cloth known as kersey. The DO may signify the English county of Dorset which manufactured kersies but not to any national significance.<sup>44</sup>

The other alnage seal (656-JR) is a two-part seal bearing a secondary stamp consisting of the Arms of London on disc one and a castle opposing it on disc two. Such seals with secondary stamps are known on Essex and Suffolk seals in a shipwreck group dating to the 1620s or early 1630s.<sup>45</sup> The Structure 165 example, which comes from a c.1610 context, suggests that this practice had an earlier beginning.

The primary stamp consists of the word *SEARCHED* which indicates that it had been inspected. Less visible are the large letters W – A D which may stand for *WOADED* which is a blue colored dye.<sup>46</sup>

Six, or 43%, of the Structure 165 seals are from German fabrics that had been imported into England, probably through London, before being shipped to Virginia. Imported textiles are generally types that were not produced in England but occasionally they are fabrics that could be obtained more cheaply abroad. Of the lead seals that have been recorded in England only one in forty is foreign,<sup>47</sup> which indicates that Continental imports were not very prevalent.

Five of the seals bear the letter A and the pinecone heraldic badge of the southern German city of Augsburg. This type of seal, known in over a dozen English counties, is the most common of the Continental cloth seals recovered in England, comprising one third of the identified assemblage.<sup>48</sup> Augsburg seals have also been recovered at Martin's Hundred, the neighboring settlement to Jamestown. There, eight seals were excavated from c.1620–1622 contexts and represent the most closely dated Augsburg seals prior to the Jamestown finds.<sup>49</sup> In Britain they are generally dated between the late 16<sup>th</sup> and mid 17<sup>th</sup> century by which “time the import of German fabrics was seriously curtailed.”<sup>50</sup>

Augsburg was known for its production of *fustian*, which is a mixed linen-warp/cotton-weft fabric. Fustian could be made with a silky finish and was often used as a substitute for velvet.<sup>51</sup> In 1610, Virginia colonist George Percy ordered from England “3 yardes 1 quarter of fustian for a dublett and Joanes fustian to lyne...4 suites & a dublett and a paire of clothe breeches.”<sup>52</sup> Percy was a gentleman who at the time of this request had been newly elected President of the colony. His doublets and breeches would necessarily be made of a fabric reflective of his rank in society. There is a reference in Shakespeare's *Taming of the Shrew*, which is believed to have been written sometime between 1594 and 1606, to the “serving men in their new fustian.”<sup>53</sup> In this case, the servants are clothed in this textile as an indication of the household's status.

Another mention of fustian in the colony occurs in 1620. Fustian was named among the fabrics sent to Berkeley Plantation in 1620 to clothe the colonists. A shipment of 57 yards of dyed “Holmes fustian,” a textile made in Ulm, Germany<sup>54</sup> was purchased in London to make 20 doublets.<sup>55</sup>

Interestingly, four of the five Augsburg seals from Structure 165 were excavated from the same level, JR158K. They have all been opened out to release the fabric from their grips and, from their casting

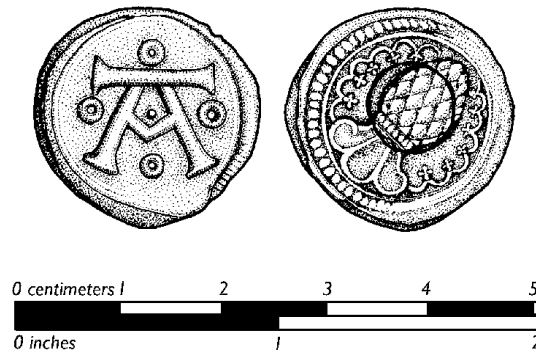
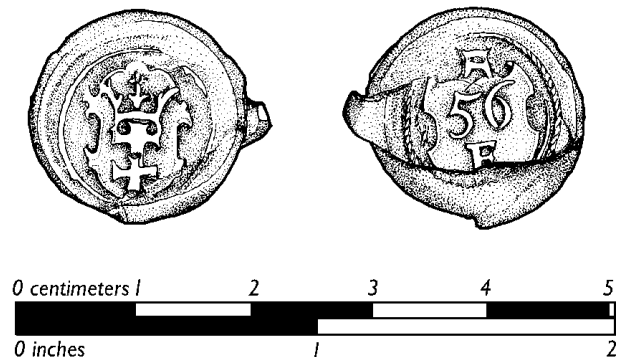


Figure 27. Cloth seal exhibiting the pinecone and letter A representing Augsburg, Germany. This example is from Jordan's Journey, Prince George County, Virginia. (PG302, F-320, EU2089, Virginia Department of Historic Resources)

marks, they appear to be from the same mold. The dies impressing the seals appear to be different, however. A similar cluster of Augsburg cloth seals found at Martin's Hundred led the archaeologist Ivor Noël Hume to conjecture that this indicated the site of the settlement's central storehouse from which goods would be issued.<sup>56</sup> It is highly unlikely that a single household would have such a large quantity of the textile in store. Perhaps this cache of textiles in Structure 165 also indicates a storehouse. This is one of the interpretations being tendered for this subterranean structure (See page 8).

The sixth Continental cloth seal in Structure 165 comes from the Baltic city of Gdansk, which was part of Germany in the 17<sup>th</sup> century but is now within Poland. Disc one of the two-part seal consists of the number “56” over an “E” on a garnished shield. This most likely represents the length of the cloth in ells.<sup>57</sup> Disc two bears the arms of Gdansk consisting of a crown over two crosses potent on a shield. This cloth seal was probably attached to sailcloth. “In the late 16<sup>th</sup> century and the early 17<sup>th</sup> century some 5 percent by value of England's imports from the Baltic were canvasses for sailmaking,

Figure 28. Cloth seal from Gdansk.



mainly brought from Gdansk to London.”<sup>58</sup> The Jamestown colonists would have need of sailcloth to repair the sails on their shallops and other boats rigged for sailing. They also evidently had need of sailcloth for shelter as illustrated by John Smith’s description of the first church at Jamestown.

*When I went first to Virginia, I well remember, wee did hang an awning (which is an old saile) to three or foure trees to shadow us from the Sunne...this was our Church.*<sup>59</sup>

The remaining four seals from Structure 165 are privy seals. They were used by weavers, merchants, and dyers and usually include initials in conjunction with the stylized privy mark or *huismerk*. This mark consists of the number 4, sometimes depicted backwards, on the top of a vertical line that terminates in two side by side x’s. Initials are usually ligatured or astride the mark.

The privy mark was “a sort of commercial heraldry” used quite commonly from the early 16<sup>th</sup> century.<sup>60</sup> They are believed to have begun as marks of property in northern and central Europe when most individuals were illiterate. They were then adapted by Dutch and English merchants as trademarks—an easily recognizable guarantee of quality.<sup>61</sup> Very few of these marks have been identified with English merchants so the dating of these seals must be pri-

marily by the style of the mark and letters.<sup>62</sup> All of the Structure 165 privy marks appear to be of the type used in the late 16<sup>th</sup> and early 17<sup>th</sup> centuries with two of the seals bearing the same ligatured “R B” initials.

## Wingfield’s Wing?

Edward-Maria Wingfield was the first president of the council in Virginia. He served 4 months in this capacity before altercations with other members of the council and growing unrest among the colonists with his leadership caused him to be removed from office. He returned to England in disgrace in April 1608, one year after his arrival at Jamestown.

Wingfield was of a distinguished family who had the right to possess a coat of arms. The arms carried by Edward-Maria Wingfield consisted “of three pairs of silver wings on a red diagonal stripe on a white background.”<sup>63</sup>

Excavations in Structure 165 uncovered what appear to be half of a pair of wings (1228-JR) that has been snipped out of thin lead sheeting. The wing fragment consists of 9 points representing feather tips. Thin lead mounts, both plain and decorative, are known from the medieval period in England. They were attached to flat surfaces on small boxes, furniture, and even the walls of houses using tacks or glue.<sup>64</sup> Since the Structure 165 mount shows no sign of attachment holes, it was presumably glued to the object it was embellishing.

Could this possibly have been on a small box or other piece of furniture owned by Wingfield and abandoned at his departure in April 1608? Or per-

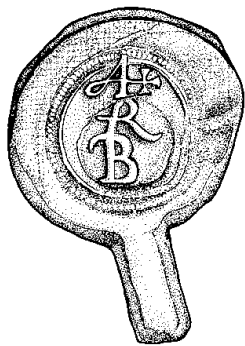


Figure 29. One of two privy seals with the initials RB.

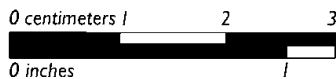


Figure 30. Privy seal bearing the initials CSMR. The back is stamped “22” in roman numerals representing the yard length of the fabric.

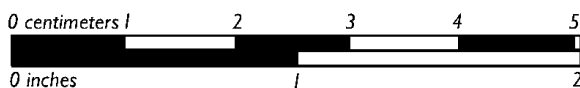
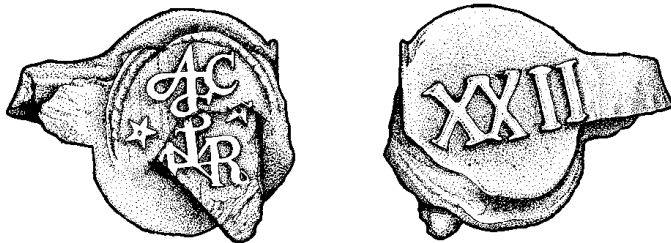
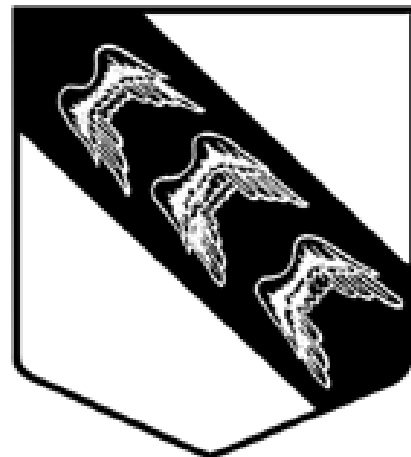


Figure 31. Coat of arms of Edward-Maria Wingfield.



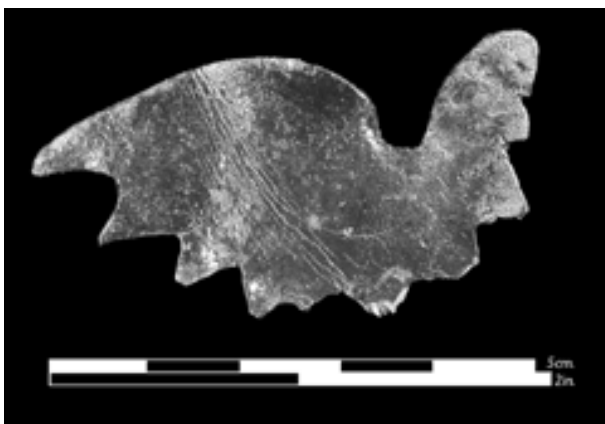


Figure 32. Lead wing fragment, possibly part of Wingfield's coat of arms.

haps it was pillaged before. Wingfield relates in his *Discourse of Virginia* that, after he was deposed from the presidency and removed from the council, the new president and council asked for the keys to his "coffers." They were searching for further evidence of fraud and treason to justify their claims against the ex-president. As he was being held prisoner on a pinnace in the river, Wingfield was helpless to stop the intrusion into his personal effects. Along with financial records and the cape merchant's inventory of the colony's provisions, Wingfield says that they "took diuers other bookes & trifles of my owne proper goods, wch I could neuer recover."<sup>65</sup> Could the silvery wing have decorated one of Wingfield's rifled chests? This question will probably never be answered with any certainty but it is interesting to reflect on the diminutive lead wing fragment as a remnant of a once very powerful individual who was very influential in the beginnings of the Jamestown colony.

## Compass Dial<sup>66</sup>

On one occasion, John Smith used a "round Ivory double compass Dyall" to extricate himself from what appeared to be sure death at the hands of a group of 200 Pamunkey Indians.<sup>67</sup> In desperation, he presented their leader Opechancanough with the instrument "whereat [Openchancanough] so amazedly admired" that he decided to spare Smith's life and, instead, take him into captivity.

The instrument to which Smith is referring in this account is a small portable combination sundial/compass, which was also known simply as a *compass* as early as the 1480s.<sup>68</sup> Nuremberg, Germany was the major manufacturing center of ivory compass dials in the sixteenth and seventeenth centuries although ivory dials are also known from Paris and Dieppe, France.

An incomplete ivory compass was recovered from Structure 165. These may have been in common use in the seventeenth century, especially among the gentlemen, but they are rare archaeological finds.<sup>69</sup> If one doesn't take Smith's description of "round" as the form of the device but rather of the dials contained within, it could very easily be the same "compass Dyall," which along with his "gowne, points and garters,"<sup>70</sup> was returned to Smith upon his eventual release.

The instrument from Structure 165 consists of half of the bottom element of what is known as a diptych, or tablet, dial. A diptych dial consists of two leaves, like a book, hinged together on one end so that the leaves open out to form a right angle. Most diptych dials include a horizontal dial engraved on the inside of the lower leaf and a vertical dial on the inside of the upper. Strung between the two leaves is a string, often referred to as the "pole string," which serves as the gnomon.

To set a diptych dial, the user must hold the instrument in the open position with the upper and lower leaves at right angles to each other and with

Figure 33. Ivory compass dial from Structure 165.



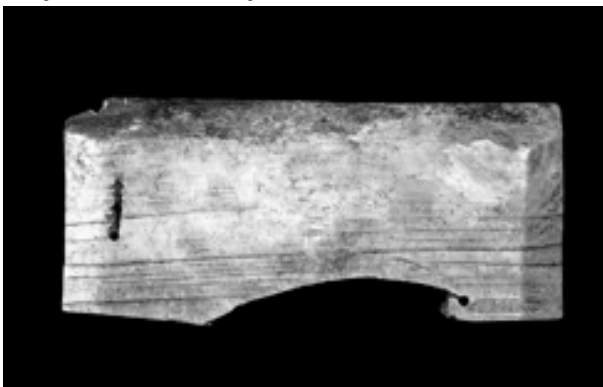


Figure 34. Side view of compass dial showing inset for the compass.

the lower leaf parallel to the horizon. By using the built-in magnetic compass, the gnomon must then be aligned with the meridian, which is the imaginary north-south line that runs through the location and the poles. Finally, the gnomon must form an angle relating to the latitude of the place where the dial is being used. Since these portable instruments were intended for use by travelers, the gnomon was often made adjustable to various latitudes. This was accomplished on the Nuremberg dials by having a choice of holes through which the top end of the gnomon string could be attached on the upper leaf.

The ivory diptych dial found in Structure 165 consists of half of the lower leaf incorporating a horizontal dial. Engraved on the inner surface are the daylight hour lines of 6 a.m. through 12 noon, with the digits in Roman numerals and with dots marking the half-hours. There are indications that the numbers were once colored with a red pigment, probably cinnabar.<sup>71</sup> Two small crosses with expanded ends that are punched in each of the two existing corners also show signs of red pigmentation. The other lines of the dial appear to have been colored black.

Figure 35. Back of compass dial with the hole for the gnomon string visible on the lower right.



The dial surrounds a recess that would have held a magnetic compass which, as previously mentioned, is necessary to insure that the gnomon is properly aligned. The gnomon is now missing but would have been attached to the lower leaf by being knotted through a hole that is visible passing through to the back.

The latitude for which the compass was designed was determined by calculating the existing dial angles of the compass. To accomplish this, the formula

$$\log \sin \theta = \log \tan D - \log \tan t$$

was applied whereby  $D$  is the angle formed by the hour line and the 12 o'clock line,  $t$  is the time measured from noon in degrees and minutes of arc, and  $\theta$  is the latitude of the place where the dial is to be used.<sup>72</sup> As can be seen in Figure 36, the angles are not consistent between each hour line, suggesting that this compass dial was not well made and does not seem of the caliber of most Nuremberg dials. The hour line for 7 a.m., for instance, is  $53.8^\circ$  and varies widely from the  $46^\circ$  that the rest of the angles that seem to cluster around. According to Ptolmy's *Geography*, which was the source of latitudes for compass-makers into the 17th century,<sup>73</sup> this calibration is suitable for Venice.

The usual latitude for non-adjustable Nuremberg dials is approximately  $48^\circ$ , which would provide accurate measurement across most of central Europe, although dials could be commissioned for particular latitudes.<sup>74</sup> Adjustable instruments were also produced which could range between  $42^\circ$  and  $54^\circ$ , enabling the traveler wider flexibility.<sup>75</sup> The Structure 165 diptych compass was not adjustable and would hardly be accurate at Jamestown which has a latitude of  $37^\circ$ !

But was the main purpose of the diptych dial to read time? Certainly the most accurate of these instruments could provide local time, but what was the pressing social or economic need to have this information in 17<sup>th</sup>-century society? Much more important than precise time telling seems to have been "the aesthetic or religious satisfaction derived from making a device to simulate the heavens."<sup>76</sup> The possessor of such an instrument could hold the marvel of the working universe in miniature in his hands. John Smith's description of how he demonstrated the "compass Dyall" to his Indian captors encapsulates this essence. He was not trying to teach the Indians to tell time as they "marveled at the playing of the Fly and Needle, which they could see so plainly, and yet not touch it, because of the glass

that covered them.” Rather, he was illustrating the order of the universe that operates with understandable clockwork predictability as

*he demonstrated by that Globe-like Jewell, the roundnesse of the earth, and skies, the spheare of the Sunne, Moone, and Starres, and how the Sunne did chase the night round about the world continually; the greatnesse of the land and Sea, the diversity of nations, varietie of complexions, and how we were to them antipodes, and many other such like matters, they all stood as amazed with admiration.*<sup>77</sup>

The astronomical model of the celestial sphere, encasing the earth and encompassing all the stars and other heavenly bodies, could be demonstrated by anyone possessing this small hand-held instrument. As John Smith recounts, he is mapping the heavens for that small group of Indians in Virginia, and by doing so is describing their place on the earth in relation to the universe. The Pamunkeys are indeed *antipodes* to the English. Not only do they oc-

cupy opposite positions on the round earth, but they are also a world apart in their ideologies and the imperialistic energies that have brought the two groups together.

Did the diptych compass from Structure 165 once belong to John Smith? This will probably never be determined with any certainty; however, it is interesting to speculate, considering the latitude for which the compass was calibrated, that Smith may have picked it up during his extensive travels through Italy.<sup>78</sup> But it is not really important to determine ownership of the instrument to realize its significance. The dial's presence in Structure 165 at Jamestown represents the age in which it was produced—an age of exploration and discovery, of scientific inquiry that is as much philosophy as it is science. The “compass Dyall” is a great deal more to the 17<sup>th</sup> century individual than a timekeeper delineating the hours. It is a contemplative device by which a gentleman engaged in the art of “dyalling”<sup>79</sup> could ponder his place in the world.

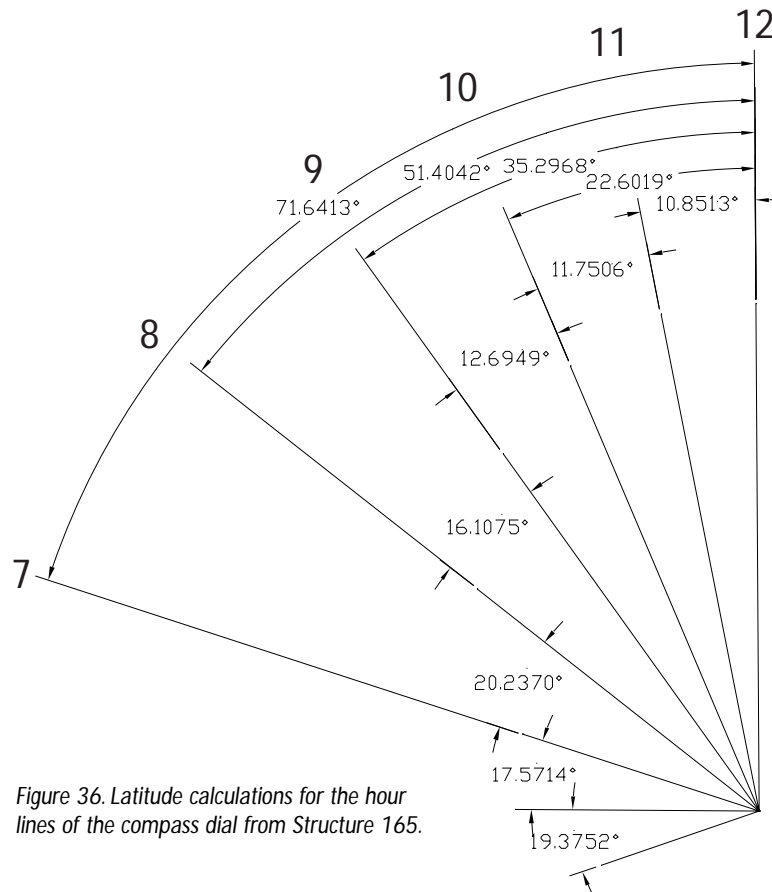


Figure 36. Latitude calculations for the hour lines of the compass dial from Structure 165.



# Appendix

## Elizabethan Alnage Seals from *Jamestown Rediscovery* Excavations

OBJ ID	CONTEXT	PART	DESCRIPTION
77-JR	Plowzone	2	-//portcullis
194-JR	Pit 1	2	-//Tudor Arms
346-JR	Ditch 1	4	-//rampant lion and unicorn flanking fleur de lis/ER//-/portcullis
520-JR	Pit 3	2	ER astride Tudor Arms/159-//incised 222
521-JR	Pit 3	2	Inscribed ligatured RW privy mark
927-JR	Midden 1	2	-//portcullis
1112-JR	Structure 165	2	-//crown over seeded rose, E to side, N.PAN.ERO Kent and fleur de lis around
1216-JR	Structure 165	2	-//Tudor Arms with E

The conventions used in the descriptions are the same as outlined by Geoff Egan (1994:viii):

- no stamp or other device
- // next disc or part
- / next line on same disc

Disc one is described first. On the four part disc, the inner disc next to disc one is disc two and is described in that order, and so on.





# Notes

- 1 Nicholas Luccketti and Beverly Straube. *1997 Interim Report on the APVA Excavations at Jamestown, VA* (Richmond VA: Association for the Preservation of Virginia Antiquities, 1998).
- 2 *Ibid.*, 10-11.
- 3 Alexander Brown, *The Genesis of the United States* (Cambridge: The Riverside Press, 1891), II:1048.
- 4 *Ibid.*, II:415.
- 5 *Ibid.*, I:492.
- 6 *Ibid.*, II:869-870.
- 7 Philip L. Barbour, ed., *The Complete Works of Captain John Smith (1580-1631)* (Chapel Hill, NC: The University of North Carolina Press, 1986), II:317-318.
- 8 Ivor Noel Hume, *The Virginia Adventure* (New York Alfred A. Knopf), 230.
- 9 Edward Wright Haile, *Jamestown Narratives* (Champlain, VA: Roundhouse, 1998), 894.
- 10 Ivor Noel Hume, *Martin's Hundred* (Charlottesville, VA: University Press of Virginia, 1991), 54-59.
- 11 James Deetz, *Flowerdew Hundred* (Charlottesville, VA: University Press of Virginia, 1993), 61-63.
- 12 Excavation records on file with the Virginia Department of Historic Resources, Richmond, VA.
- 13 William M. Kelso, personal communication, 1994.
- 14 Barbour, I:233, II:180, 262; William Strachey, "A True Reportory of the Wreck and Redemption of Sir Thomas Gates, Knight," in *A Voyage to Virginia in 1609*, ed. Louis B. Wright (Charlottesville, VA: University Press of Virginia, 1964), 79.
- 15 Strachey, 79-81.
- 16 Barbour, II:337.
- 17 Ivor Noel Hume, "The Reconstructed Jamestown Fort A Re-examination of the Documentary and Interpretive Evidence," (manuscript report on file, APVA Jamestown Rediscovery, 1983), 52.
- 18 Detailed discussions of Renaissance fortifications can be found in Christopher Duffy, *Siege Warfare, The Fortress in the Early Modern Period 1494-1660* (London: Routledge, 1997); Geoffrey Parker, *The Military Revolution* (Cambridge, UK: Cambridge University Press, 1996); and Quentin Hughes *Military Architecture* (Liphook, UK: Beaufort Publishing Ltd., 1991).
- 19 Jamestown Land Patents, Book 2, 10-11, Virginia State Land Office, Richmond, VA.
- 20 William Byrd Title Book, 1637-1743, Virginia Historical Society, Richmond, VA.
- 21 Annie A. Galt, Mary J. Galt, Mary W. Garrett, et. al., "Report of Excavations Made at the Jamestown Church, 1894-1902 (manuscript report on file, APVA Jamestown Rediscovery).
- 22 John C. Cotter, *Archaeological Excavations at Jamestown Virginia* (Archaeological Society of Virginia, Special Publication No.32, 1994), 66-67.
- 23 Gerald Johnson, draft report on groundwater wells and vibracoring at Jamestown (manuscript report on file, APVA Jamestown Rediscovery).
- 24 Geoff Egan and Frances Pritchard, *Dress Accessories* (London: HMSO, 1991), 377.
- 25 *Oxford English Dictionary* (Oxford: Clarendon Press, 1998), 825.
- 26 Egan and Prichard, 377.
- 27 William Hone, *The Every-Day Book* ( London: 1828), vol 1, 1255.
- 28 Randle Holme, *The Academy of Armory* (Chester: 1688), III: Chap 11, 427.
- 29 Charles Allen {1686} *Curious Observations on the Teeth* as quoted in Liza Picard, *Restoration London*, (London: Weidenfeld and Nicholson, 1997), 131.
- 30 Brendan Derham, personal communication, 1999.
- 31 John Woodall, *The Surgions Mate* (1617; reprint with foreward by John Kirkup, Bath: Kingsmead, 1978), 17-18.
- 32 Holme, II: Chap 15, 357.
- 33 Geoff Egan, personal communication, 1999.
- 34 An inventory from the 1630s on the Eastern Shore of Virginia lists a *silver toth picker* worth 2 shillings. Susie M. Ames, ed., *County Court Records of Accomack-Northampton, Virginia 1632-1640*, American Legal Records Volume 7. (Washington, D.C.: The American Historical Association, 1954), 143.
- 35 A silver combination earscoop and nail/tooth cleaner was excavated from Jordan's Journey in Prince George County. The site is located at the confluence of the James and Appomattox rivers, 30 miles upriver from Jamestown.
- 36 A gold ear picker with a sickle-shaped tooth/nail cleaner was found in a German tomb dating to 1614 (Egan and Pritchard, 379).
- 37 Geoff Egan, *Lead Cloth Seals and Related Items in the British Museum*, British Museum Occasional Paper 93 (London: The British Museum, 1994), 1.
- 38 Egan, *Lead Cloth Seals*, 4.
- 39 Egan, personal communication, 1994.
- 40 John W. Shirley, "George Percy at Jamestown, 1607-1612," *The Virginia Magazine of History and Biography* 57:3 (1949), 237.
- 41 Brown, II:115.
- 42 On at least two occasions John Smith complains about the condition of the tents that the first colonists were provided: *our Tents were rotten* (Barbour, 1:35); and *in foule weather we shifted into an old rotten tent* (Barbour, III: 295).
- 43 Susan Myra Kingsbury, *The Records of the Virginia Company of London* (Washington D.C.: Government Printing Office, 1906), IV: 450
- 44 Egan, *Lead Cloth Seals*, 25.
- 45 Geoff Egan, personal communication, 1999.
- 46 Geoff Egan, personal communication, 1999.
- 47 Geoff Egan, "England's Post-Medieval Cloth Trade: A Survey of the Evidence from Cloth Seals," in Duncan R.

Hook and David R.M. Gaimster (eds.) *Trade and Discovery: The Scientific Study of Artefacts from Post-Medieval Europe and Beyond*. (London: British Museum Press, 1995), 319.

48 Egan, *Lead Cloth Seals*, 106.

49 Noel Hume, *Martin's Hundred*, 190-191.

50 Egan, "England's Post-Medieval Cloth Trade," 319.

51 Kathy Lynn Emerson, *Everyday Life in Renaissance England From 1485-1649* (Cincinnati, Ohio: Writer's Digest Books, 1996), 22.

52 Shirley, 237.

53 William Shakespeare, {1597} "Taming of the Shrew" in William Aldis Wight, *The Complete Works of William Shakespeare* (New York: Garden City Books, 1936), 213-246, iv.i.49.

54 OED.

55 Kingsbury, III:385.

56 Noël Hume, *Martin's Hundred*, 191.

57 The English ell was 45 inches whereas the Dutch ell was 27 inches (Egan, *Lead Cloth Seals*, 145).

58 Egan *Lead Cloth Seals*, 113.

59 Barbour, III: 295.

60 Sheelah Ruggles-Brise, *Sealed Bottles* (New York: Charles Scribner's Sons, 1949), 162. This mark was adapted by Virginians for use on their personally marked wine bottles. Interestingly, this practice does not extend to English individuals or merchants.

61 Robert Steinuit, "Early relics of the VOC trade from Shetland :The wreck of the flute *Lastdrager* lost off Yell, 1653," *The International Journal of Nautical Archaeology and Underwater Exploration* (1974) 3.2: 243-244.

62 Egan, *Lead Cloth Seals*, 78.

63 Jocelyn R. Wingfield, *Virginia's True Founder: Edward-Maria Wingfield and His Times 1550- c.1614*. (Athens, Georgia: The Wingfield Family Society, 1993), 1.

64 Geoff Egan, *The Medieval Household*. (London: HMSO, 1998), 84.

65 Wingfield, 328.

66 I would like to thank Robert D. Hicks of Loxodrome History Consultants for his thoughts on the use of portable compass dials in early 17th-century Europe and for his assistance in locating resources for this research. The description of diptych dials is largely derived from Gouk (Penelope Gouk, *The Ivory Sundials of Nuremberg*

1500-1700. (Cambridge: Whipple Museum of the History of Science, 1988)) which is a comprehensive study of the Nuremberg sundial industry. My gratitude also extends to Hazel Forsythe of the Museum of London (MOL) who very kindly showed me the sundials in the MOL collection.

67 Barbour, II: 147.

68 Gouk, 9.

69 A brass compass case was excavated from The Governor's Land, a site adjoining Jamestown, from a c. 1617-1624 context (Allan Outlaw, *Governor's Land* (Charlottesville: University Press of Virginia, 1990), 150, fig A3.18.219). It bears the inscriptions: *Ich campast kan nicht recht weis ennase bey eissen* [This compass cannot give true direction when near iron]; *Wenn Gott wil so ist das rechtzil* [God willing you will find the right path]; and *Devs vitae nos trae terminvs es* [God is the goal of our lives]. German and Latin sayings are commonly found on Nuremberg compasses c. 1520-1610. The injunction to not use the compass near iron is commonly found on instruments produced by the Tucher family (Gouk, 95).

70 Barbour, I:49.

71 Gouk, 72. Coloration of the engraving was common in various combinations of red, black, green, blue, and orange/brown.

72 Albert E. Waugh, *Sundials: Their Theory and Construction*. (New York: Dover Publications, Inc., 1973), 48.

73 Gouk, 90.

74 Gouk, 89-90.

75 Gouk, 88.

76 Derek Price *Technology and Culture*. V:1 (1964) as quoted in Waugh, 5.

77 Barbour, II: 147.

78 Barbour, III:345. Before Smith's tenure at Jamestown, he was adventuring throughout Europe. Venice was one of his destinations.

79 *Dyalling* is described by Joseph Moxom in his *Mechanical Exercises* as a **Mathematical Science**, attained by the *Philosophical contemplation of the Motion of the Sun, the Motion of the Shadow, the Constitution of the Sphere, the Scituation of Planes, and the Consideration of Lines* (Joseph Moxom, *Mechanical Exercises* (London: 1703), 307).