Dating the Colonial-Era Davis Site (44LA46) in Lancaster County, Virginia

Marcus M. Key, Jr., Tara E. Jones, and Carolyn H. Jett

Abstract

This is the first detailed archeological analysis of the Davis Site (44LA46), located on the Eastern Branch of the Corrotoman River in Lancaster County, Virginia. The goal of the study was to date the site's colonial occupation using historical archeological methods. Plow zone surface collections, which were dominated by clay tobacco pipe fragments, formed the basis of the study. The very complete courthouse records in Lancaster County permitted an integrated historical archeological approach to dating the site. The timing of colonial occupation was determined using five independent approaches. The first three were based on archeological artifacts: (1) pipe stem bore diameters calculated a mean date of 1674, (2) pipe bowl shapes indicated a mean date of 1696, and (3) pipe makers' marks suggested a mean date of 1675. The last two were based on historical documents: (1) courthouse records and (2) tithable rolls which indicated mean dates of 1686 and 1687, respectively. The historical records indicate the site was occupied by the Thomas Buckley family. The archeological data and the historical data closely matched, resulting in a mean date for the colonial occupation of the Davis Site of 1684, with a maximum range of 1650–1718.

Introduction

The most productive archeological studies of American colonial sites draw upon data sets of both history (i.e., written documents) and archeology (i.e., material culture). The merger of these two complementary disciplines, historical archeology, permits more rigorous hypothesis testing (Deetz 1988, 1993). This approach, utilizing both historical documents and archeological artifacts, was chosen for this study. The ultimate goal was to date the colonial occupation of the previously undescribed Davis Site in Lancaster County, Virginia.

Site Description

The Virginia Department of Historic Resources site number for the Davis Site is 44LA46. The site is in the Northern Neck of Virginia (Figure 1) in the Outer Coastal Plain physiographic province (Wentworth 1930). The Northern Neck is a 225 km (140 mi) long, 32 km (20 mi) wide peninsula in northern Virginia bounded by the Potomac River to the north, the Chesapeake Bay to the east, and the Rappahannock River to the south (Beale 1967; Newton and Siudyla 1979). The Northern Neck has extensive navigable estuaries which frequently penetrate the peninsula along its length (Beale 1967).

One of these estuaries is the Corrotoman River. The north shore of the Eastern Branch of the Corrotoman River is located 65 m (210 ft.) to the southeast of the site (Figure 2). The estuary is still quite navigable at this site (Dickson 1992) and was in the past, as evidenced by the presence of a steam boat landing here in the 1800s. The site is located 6.6 km (4.1 mi) south of Lancaster, Virginia, between the mouths of Hills Creek and Bells Creek. The river here is estuarine and has a mean tidal range of roughly 2 ft. (Wentworth 1930). The shoreline consists of a veneer of sand overlying impermeable, pre-Holocene, clay-rich sediments (Rosen 1980). This type of shoreline has the highest erosion rates in the Chesapeake Bay region with rates up to 1.1 m/y (3.7 ft./year) (Rosen 1980). The distance to navigable water undoubtedly has changed since the site was last occupied some 300 years ago. Soil erosion due to agricultural practices causes siltation, whereas waves, tides, storm surges, groundwater flow, and relative sea level rise cause erosion (Rosen 1980). The nearest freshwater is a spring which is the surface reflection of the water table of the Northern Neck's aquifer (Newton and Siudyla 1979). The spring, which is located 115 m (375 ft.) to the west (see Figure 2), currently is used for domestic water consumption by two adjacent residences. The site is located on a relatively level bluff 9 m (30 ft.) above the estuary on the Chowan Terrace, which is 9–14 m (30–45 ft.) above sea level in this area (Elder et al. 1963; Wentworth 1930). The soil developed on the site is the Sassafras loamy fine sand (Elder et al. 1963; Markewich et al. 1987). The site is in actively cultivated farm fields and

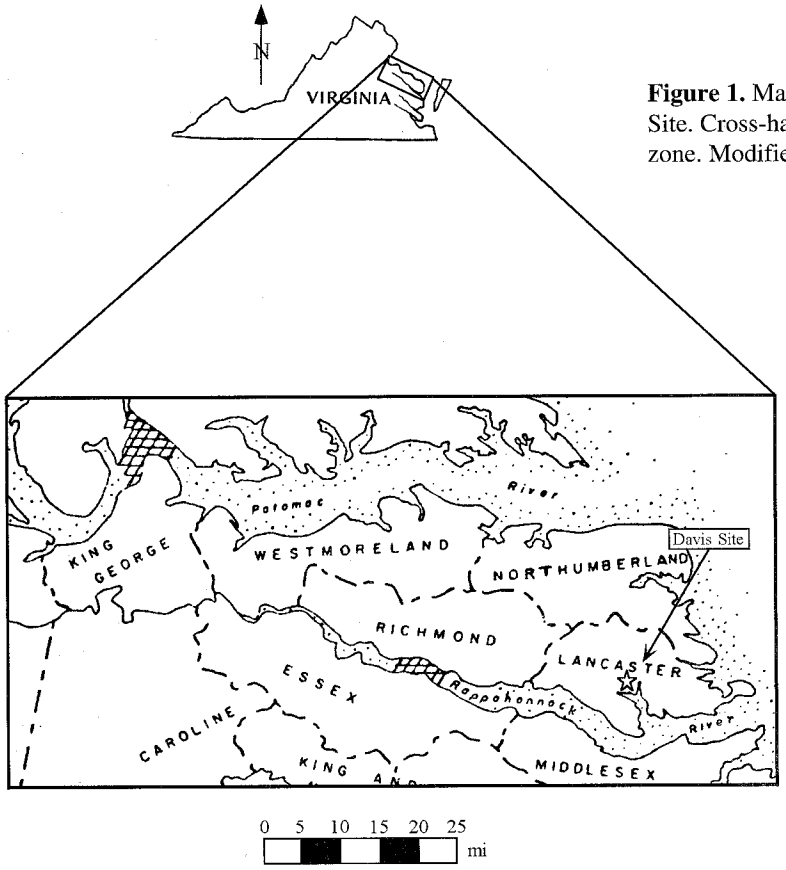

Figure 1. Map of Northern Neck showing the location of Davis Site. Cross-hatched areas indicate freshwater/saltwater transition zone. Modified from Egloff and Potter (1982:Figure 1).

is bisected by an unpaved road (see Figure 2). When freshly plowed, the site is immediately identifiable by its markedly darker organic discoloration. Using the spatial distribution of clay pipe fragments to define the extent, the site covers roughly 700 m^2 (7,500 $ft.^2$).

Materials and Methods

Because of the Northern Neck's remote location and isolation by water, it was not the site of significant military campaigns during the American Revolution or Civil War. As a result, the courthouse records of the Northern Neck counties in general and Lancaster County in particular are essentially complete from their founding in the 1600s (Gouger 1976; Horn 1994; McCartney 1993). Historical archeologists working in Lancaster County have access to a database far exceeding most colonial regions.

Archival research involved a review of relevant historical documents for the site and surrounding areas. These documents included will books, deed books, estate books, land tax books, tithable rolls, and plat maps from the Lancaster County courthouse and Mary Ball Washington library in Lancaster, Virginia; the Historic Christ Church library in Irvington, Virginia; and the Virginia Department of Historic Resources and the Library of Virginia in Richmond.

Most of the archeological sites around the Chesapeake Bay have been altered by farming, but some useful information still is preserved (Riordan 1988). At other colonial Virginia sites, it has been shown that plowing destroys all stratigraphic information in at least the upper 20 cm (8 in) (Winfree 1967). Artifact recovery rates in surface plow zones may be as low as 0.1% (Riordan 1988) and generally are less than 10% of the total plowzone artifact population, with large artifacts being disproportionately represented (Lewarch and O'Brien 1981). The benefits of plowing and discing are that they provide a large, freshly exposed area for collecting with high visibility (Riordan 1988). Despite the loss of stratigraphy and the low artifact recovery rate, plow zone collections are still important for 17th century Chesapeake archeology (e.g., King 1988; King and Miller 1987).

All the artifacts in this study are from random, unprovenienced plow zone surface collections made from 1969 to 1996. No systematic excavation has been done as the stratigraphy of the site has been compromised by plowing and erosion. The site has been and is currently plowed two or three times each year depending on the number of crops. The suite of artifacts may be biased toward stratigraphically higher (i.e., younger) material if the plowing is only bringing up shallow material. If this is the case then the estimated dates for the site from the archeological artifacts are maximum dates with the actual dates being older.

Pipe Fragment Dating Methods

English clay tobacco pipes have been demonstrated to be one of the most sensitive temporal archeological indicators available. This is made possible by the rapid systematic reduction in stem bore diameters, rapid evolution of the bowl shape, and the historic records of makers' marks and their dates of manufacturing. Imported clay tobacco pipes are the most accurate chronometric tool in colonial American sites as they are often the most numerous artifacts, and they had a short life, thus placing the date of manufacture close to the date of

discard (I. Noël Hume 1963; Walker 1977). But not all aspects of the pipes are effective dating tools. Stem length is not useful, as complete stems are too rare (Walker 1977). Stem thickness is not useful, as it varies along the stem (Rippon 1917). Stem curvature is not useful, as almost all pipes from the 1600s were straight (Walker 1977). Stem decorations are not useful, as they are not common on English pipes (Walker 1977). The first and most common approach to using clay tobacco pipes to date sites is based on the stem bore diameter.

Harrington (1951) originally developed the idea of using clay tobacco pipe stem bore diameters as a chronometric tool. During his years as the head archeologist at Jamestown, Virginia, he realized that the average pipe stem bore diameter decreased at a constant rate throughout the 1600s and early 1700s (Harrington 1954, 1955). The rate of decrease was roughly 1/64 in. per 30 years (Deetz 1988). The decreasing bore diameters coincided with increasing stem lengths (Harrington 1954). From 1660 to 1700 the lengths increased on average from 25 cm (10 in) to 33 cm (13 in) (I. Noël Hume 1969; Walker 1977).

As pipes became longer, the wires to make the stem bores decreased in thickness. The pipe stem bores were made by hand by inserting a steel wire into the clay before inserting the clay into the pipe mold (Hughes 1961; Oswald 1961). A longer stem required a thinner wire for reaming out the hole (Deetz 1993; Harrington 1955; I. Noël Hume 1969), thus producing smaller holes and thicker stem walls (Hanson 1971). Another factor may have been improved technology which allowed production of wires with smaller diameters (Hanson 1971).

Stem length may have increased simply as a fashion trend (Omwake 1967) or because of a simultaneous increase in bowl size (see discussion of bowl shape typologies, below). Clay pipe bowls became larger throughout the 1600s as tobacco production increased, causing tobacco prices to decrease; tobacco became less of a luxury, and more could be smoked (Calver 1931; Deetz 1993; Fairholt 1859; MacInnes 1926; I. Noël Hume 1963, 1982; Walker 1977). As the bowls increased in size, the tobacco burned longer and made the pipe stem hotter, which made a longer stem more comfortable to hold (Deetz 1993). Mitchell and Mitchell (1982) also argued that the English manufacturers of clay pipes made the stems longer when they realized that the smoker experienced less discomfort if the smoke from the burning tobacco was drawn through a longer stem. Whatever the reason(s), all these factors combined to produce a trend of decreasing stem bore diameters. Obviously not all English pipemakers decreased their bore diameters at the same rate, but there was a significant general trend (Hanson 1971).

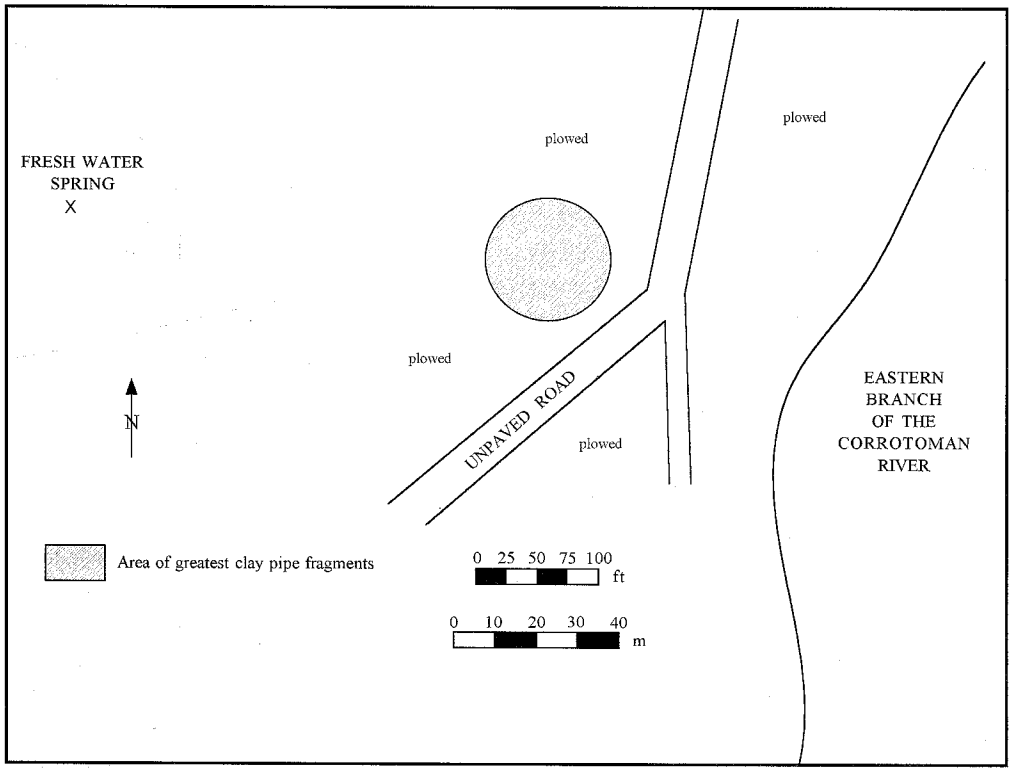

Figure 2. Davis Site (44LA46), sketch map showing the location of the fresh water spring and the Eastern Branch of Corrotoman River.

Like pottery, clay pipes are ideal archeological material as their brittleness guaranteed frequent breakage, their low cost guaranteed swift disposal, their crystalline structure virtually guaranteed preservation, and attributes of the composition, morphology, manufacturing technique, decoration, and place of disposal of the whole specimens can be as easily determined from fragments as from whole pipes (Braun 1983). The overwhelming majority of ceramic deposits (e.g., pipe stems) resulted from original failure of the object through use, but post-depositional failure (i.e., secondary fragmentation) also has a measurable effect (Braun 1983).

Clay tobacco pipes were extremely fragile, with life spans counted in days; once broken, they were thrown away (Deetz 1993; Harrington 1951; Mitchell 1983; Oswald 1959a, 1975; Walker 1977). Some might have been broken intentionally, on certain occasions, or for sanitary reasons (Harrington 1951). In the 1600s, they were as expendable as cigarette butts today (I. Noël Hume 1963, 1969). Because of their low cost (e.g., only one cent in 1743), smokers often would discard them after only a single or few smokes or as the pipe became overripe (Calver 1931; Fairholt 1859; I. Noël Hume 1969; Walker 1977). As a result the time between their manufacture and disposal was relatively short.

Harrington (1954) formalized the trend of decreasing bore diameters by comparing the ranges of bore diameters from Jamestown sites of different ages that had been independently dated using other artifacts. Chalkley (1955a) immediately attacked the idea, based on alleged problems of noncircular bore diameters, varying bore diameters produced by the same pipe making tool, and the lack of standardization of pipe making tools in England. Harrington (1955) pointed out the error and/or irrelevance of these concerns, and Omwake (1956) and Whitehouse (1966) independently confirmed the validity of Harrington's correlation using other sites. Whitehouse's (1966) study was especially important at it was performed on pipe stems from Bristol, England where most of the colonial American pipes were made. After this, further challenges to the Harrington method were rare (e.g., Alexander 1955, 1983; Chalkley 1955b).

The Harrington method gives a general range of dates of occupation for a particular site (Walker 1968). Binford quantified Harrington's (1954) qualitative relationship between bore diameter and age by fitting a linear regression to the original mean bore diameter frequency histograms (Binford 1962; Maxwell and Binford 1961). The resulting equation calculates the mean date of occupation of a site. The equation benefitted from not having to arbitrarily fit frequencies to Harrington's original bar graphs. The equation was tested by Binford and its accuracy confirmed at other colonial sites using independent age criteria. Omwake (1967) followed this with a slightly different equation. Hanson (1971) questioned the legitimacy of Binford's equation and proposed several equations each for a specific time period. Binford (1972) pointed out that the concerns raised by Hanson (1971) were unjustified due to Hanson's confusion of Harrington's original mean dates as median dates. Hanson (1972) agreed, and Binford (1972) applied his technique to several more independently dated sites, further confirming the accuracy of the method.

Binford (1972) also proposed another technique for estimating the duration of site occupation using the standard deviation from his original equation. A smaller standard deviation (i.e., a sharper peak in the frequency histogram) indicates a briefer period of occupation at a site (Deetz 1988). Cresthull (1972) followed with two new equations: one linear and one curvilinear. Finally Heighton and Deagan (1972) proposed their own curvilinear relationship based on different sites than Harrington's (1954) original Jamestown ones.

There are several potential problems with using stem bore diameter as a chronometric tool that could cause error in the calculated dates. First, individual pipes must have only one bore diameter. Individual pipes with multiple bore diameters have been reported. For example, Outlaw (1990) described one pipe with three bowls converging into one stem with two different bore diameters. Alexander (1979) reported a few stem fragments (<3% of the total sample population) with different bore diameters at opposite ends of the stem. Second, the technique is best used on sites from 1670/1680 to 1760/1780, as the correlation between diameter and date weakens outside this range (Binford 1962; A. Noël Hume 1963, 1979; I. Noël Hume 1963, 1969). Third, the sample must contain only English pipe stems; inclusion of Dutch pipes in the analysis could introduce error, as Dutch pipes had smaller stem bores than English pipes (Hanson 1971; Harrington 1954). Also, the number of pipe stem fragments must be large enough to be representative of the actual population (Binford 1962). There has been disagreement, however, on how many fragments are enough to obtain an accurate date for a site. Harrington (1954, 1955) warned that his technique should not be applied to only a few stem fragments. I. Noël Hume (1963) suggested as few as 75–100 stem fragments was sufficient, whereas A. Noël Hume (1963) argued for up to 900 or 1,000. Finally, the sample of pipe stems must be random with respect to the rate of accumulation of stems (i.e., the number of pipe stems being added to the site

must be stable during the period of sample accumulation) (Binford 1962; Deetz 1987; Omwake 1967). Population, percent of smokers, rate of pipe consumption, cost of pipes, availability of pipes, strength of pipes, and length of pipes all affect the accumulation rate of stem fragments (Omwake 1967). For example, if the number of pipe smokers changed through the duration of the site occupation, it could skew the results (e.g., lots of pipe smokers early in site history would skew results to an older mean date for the site).

Despite these potential problems, the technique has now been widely adopted. It has been applied successfully in a diverse range of sites including England (Oswald 1960; Whitehouse 1966), Nova Scotia (Walker 1968), Delaware (Omwake 1956), Georgia (Irwin 1959), Maine (Camp 1982; Fox 1972), Maryland (Omwake 1956, 1967), Massachusetts (Deetz 1960), Michigan (Binford 1962; Maxwell and Binford 1961), New York (Barber 1966; McCashion 1975, 1992; McCashion and Robinson 1977; Omwake 1958), North Carolina (South 1962), South Carolina (Eaton 1962; Walker 1970), and Virginia (Edwards and Brown 1993; Emerson 1988; MacCord 1969; A. Noël Hume 1963; I. Noël Hume 1962, 1963, 1982; Pawson 1969).

To analyze the bore diameters at the Davis Site, all the artifacts were soaked in water and cleaned. The bores of all pipe stem fragments were cleaned out with a thin wire using special care not to damage the stem bore. Following the standard methodology of Harrington (1954), pipe stem bore diameters were measured with drill bits in 1/64 in. increments from 3/64 to 10/64 in. (roughly 1–4 mm). The blunt ends of the bits were used to avoid the problems associated with the cutting ends (Walker 1965, 1968). The bore diameters were used to calculate the date of occupation of the site, utilizing all the published equations. In addition, the length of each pipe stem fragment was measured with calipers to the nearest mm with a measurement error of 4.5%.

The second approach to using clay tobacco pipes as a chronometric tool uses the shape of the bowl, which evolved in a known way through the 1600s and 1700s. This typological approach has been widely used since the 1950s for dating archeological sites. The first bowl shape typology was proposed by Croker (1835) who observed that bowls became larger as tobacco became cheaper. This idea of dating sites based on bowl shape was furthered by Fairholt (1859), improved by Jewit (1863), and perfected by Oswald (1951, 1955, 1961, 1975). I. Noel Hume (1963, 1969) modified Oswald's Standard Typology into one for colonial pipes in the eastern United States. Though it is not used as widely as pipe stem bore diameters as a dating tool, some archeologists think it is more reliable (e.g., Outlaw 1990).

The typological dating approach is based primarily on the stratigraphic correlation of certain bowl shapes in England with other, independently dated artifacts and secondarily on dated drawings by contemporary artists, pipes bearing dates, and makers' marks (Atkinson and Oswald 1969; Oswald 1951, 1955, 1960, 1961, 1970, 1975). In general, bowl shape changed through the 1600s from small bulbous bowls whose rims were not parallel to the pipe stem to larger, more elongated, straight-sided bowls whose rims were parallel to the pipe stem (Fresco-Corbu 1964; Oswald 1951, 1955, 1961, 1975). Elaborately molded pipes decorated with human faces became more common from 1750 to 1850 (I. Noël Hume 1963, 1969; Oswald 1959a, 1960). The change in bowl shape was rapid enough to permit a 20 year resolution in dating sites from the 1600s (Emerson 1988).

Unlike shape, other aspects of the bowls are not as effective dating tools. In general, bowl decorations are too rare on English pipes to be of much use until the later 1700s (Walker 1977), but some earlier decorations do provide crude dates. Rouletting around the mouth of bowls traditionally was considered not to be age-diagnostic (Omwake 1967). More recent workers, however, have suggested that rouletting decreased in frequency beginning around 1700 (e.g., Pogue 1991; Potter and Sonderman 1991). Thus, the presence of rouletting around the mouth of the bowl suggests a rough date before the 1700s. Pipes made in England for export to the colonies often were heelless or spurless unlike contemporaneous pipes in England (Oswald 1955, 1959b). This may have been because (1) the market demand in the colonies for Native American–type pipes (Omwake 1967), (2) heelless or spurless pipes were less susceptible to breakage during shipment to the colonies (Oswald 1955), and/or (3) heelless or spurless pipes were more profitable for export as their simpler design required less trimming and finishing (Alexander 1979). By 1690, Bristol manufacturers were making pipes without heels or spurs for export to the colonies (I. Noël Hume 1969). Thus, the presence of heels or spurs on bowls suggests a date before the 1690 (Walker 1977).

There are two potential problems with using bowl shape as a chronometric tool. First, at some sites like Jamestown (Harrington 1954) and the Davis Site, complete bowls are rare. Second, the typological approach is not exact because as styles changed, the molds were not simultaneously changed by all manufacturers (Emerson 1988), but just as with the stem bore diam-

eter, there was a general evolutionary progression (Oswald 1960).

All relatively complete pipe bowls from the Davis Site were analyzed to determine the approximate date of manufacture using all published typologies, with Oswald (1975) and Walker's (1977) being the most widely accepted. Each bowl's stem bore diameter also was measured when possible. Friederich's (1970) alternative dating technique based on pipe bowl dimensions for Dutch pipes was not used here as it is not applicable to English pipes. Bowl dimensions are an effective way to quantify bowl shape (Emerson 1988:Figure 8) and Emerson's (1988) pipe bowl terminology was used. The following attributes were measured on the bowls: bowl lip thickness, bowl height, and mouth diameter. The bowl lip thickness was measured at the mouth of the bowl. In order to account for any variation in lip thickness around the mouth, the thickness reported is the mean of four thicknesses: two measured parallel to the stem of the pipe on opposite sides of the mouth, and two perpendicular, also on opposite sides of the mouth. Bowl height was measured as the distance inside the bowl from the bottom of the bowl in the stem bore to the center of the mouth. The mouth diameter was measured inside the mouth in the plane of the lip. In order to account for any non-circularity in the mouth shape, the diameter reported is the mean of two diameters, one measured parallel to the stem of the pipe and the other perpendicular. All three parameters were measured with calipers to the nearest 0.1 mm with a measurement error of 6.7%. The colors of the bowls were also determined using the Munsell color notation (Munsell 1994).

The third approach to using clay tobacco pipes as a chronometric tool involves makers' marks. Makers' marks usually consisted of the manufacturer's initials stamped on the pipe's heel, spur, bowl, or stem before firing. When the pipemaking guild became an officially incorporated body in England in 1619 (Fresco-Corbu 1964), the dates that the various makers' marks were used began to be recorded. Fairholt (1859) was the first to recognize the significance of makers' marks for dating pipes, but the technique was slow to be adopted due to faulty early studies (Price 1900; Pritchard 1923; Sheppard 1912; Thursfield 1863, 1907). It was not until Oswald (1960, 1975) and Atkinson (1965; Atkinson and Oswald 1969) documented the manufacturing dates of over 2,000 pipemakers, that the technique was widely used for dating archeological sites.

There are four potential problems with using marker's marks as a chronometric tool that can make it imprecise. At some sites like Jamestown (Harrington 1954) and the Davis Site, they are very rare. Second, pipemaking shops were often family-owned businesses which may have used the same maker's mark for many generations (Emerson 1988). Third, imitators copied some of these marks, as evidenced in locally made colonial Virginia pipes with English makers' marks (Emerson 1988). Also, many of the makers' marks consisted of two initials, which often are not attributable to a specific maker or time period (Emerson 1988; Oswald 1955, 1959a, 1960).

All pipe fragments from the Davis Site were examined for makers' marks. The standard references for makers' marks (i.e., Oswald 1960, 1975; Walker 1977) were used to determine the identity of manufacturers and the approximate dates of manufacture.

Historical Setting

After 1625, tobacco became the economic lifeblood of colonial Virginia (Billings et al. 1986). Politically, socially, agriculturally, and economically, colonial Virginia had a tobacco culture (Gray 1933; Jett 1990); this was especially true of the Northern Neck in general (Gouger 1976) and Lancaster County in particular (Wheeler 1972) (see Figure 1) where sweet-scented and Oronoco tobaccos were grown (Horn 1994). The profit-driven, single-crop, tobacco economy led planters to ignore the need for crop rotation. The consequences of this were nutrient depletion and soil erosion, causing decreased tobacco production and eventual land abandonment. This produced a constant demand for newly cleared "fresh" land, which resulted in a constant pushing westward of the Native Americans (Billings et al. 1986; Craven 1965; Gouger 1976). This destructive agricultural process was accelerated by natural leaching of the top soil, both from heavy rainfall and primitive plowing practices (Billings et al. 1986; Craven 1965). After the soil became exhausted and tobacco production declined, corn was widely planted. Because of the planting methods used, which included cross plowing, growing corn proved to be even more conducive to soil erosion (Craven 1965). It was this agri-economic system, with its pattern of soil exhaustion and land abandonment, that led to the settlement of the Northern Neck.

As the settlers fanned out from Jamestown looking for new land, significant pressure was put on the government to open up the Northern Neck for settlement (Billings et al. 1986; Wheeler 1972). In the 1630s, the Northern Neck was still Native American territory, practically outside the jurisdiction of Virginia (Harrison 1964). What followed was a rapid displacement of Native Americans by English settlers. The Native Ameri-

can communities in tidewater Virginia declined rapidly following contact with English settlers due to forced and/or voluntary displacement to the west, as well as death from disease, warfare, and malnutrition from loss of habitat (Beale 1967; Dobyns 1966, 1983; Fausz 1987; Harrison 1964; Hodges 1993; Jennings 1975; McCartney 1985; Ramenofsky 1987).

Little is known about the Native Americans in the Northern Neck until the General Assembly of the Virginia burgesses at Jamestown passed two acts (1641 and 1642) restricting settlement in that area in order to save it for the Native Americans (Warner 1965). Beale (1967) argued that the 1642 act, prohibiting settlement north of the Rappahannock River, was enacted because of the instability of the Northern Neck due to the presence of Native Americans.

The first English settlements in Northern Neck were along the south shore of the Potomac River at Chicacoan, the Native American village called Cekakawwon on Smith's 1612 map. These settlers were not from Virginia, but from Maryland (Harrison 1964; Haynie 1959; Warner 1965). The estimated arrival date ranges from 1640 (Freeman 1948; Jett 1997; McCartney 1993) to 1642 (Hening 1809–1823; Nugent 1983; Potter and Waselkov 1994) to 1644 (Harrison 1964).

The first patent in the Northern Neck was in the Corrotoman River area (now Lancaster County) and was made to John Carter (Nugent 1983; Warner 1965). Most land grants in this period were made under the headrights system, which allowed 50 acres for every person for which one paid the cost of transportation to the colony (Robinson 1957). As defined in 1666, "seating" meant building a dwelling and keeping stock for one continuous year, whereas "planting" meant clearing, tending, and planting one acre of land in any crop (Robinson 1957). If a patented tract of land was not seated or planted within three years, the land reverted to the Crown (Freeman 1948).

Encroachment on their lands by English colonists led Native Americans, under the leadership of Opechancanough, to retaliate in the massacre of 1644. It is not known whether the Northern Neck tribes participated, but they probably did not (Rountree 1990; Warner 1965; Wheeler 1972). Although permission had not yet been given for the colonists to settle in the Northern Neck, an act passed by the General Assembly of 1645 confirmed their presence and ordered them to raise funds for war (Hening 1809–1823). It was not until 1648, though, that Northumberland County was established officially by the assembly (Hening 1809–1823).

In the meantime, a treaty made with the Powhatan in 1646 gave all the land between the York and James rivers to the English and reserved the land north of the York River for the Native Americans (Harrison 1964; Wheeler 1972). The colonists were forbidden to settle there for the time being. The treaty was an integral part of Governor Berkeley's newly formulated Indian Policy to reduce conflict with the Native Americans (Billings et al. 1986). But within the same act, confirmation was given to all previous claims to lands north of the York River, and patentees of those claims were assured that the three year requirement for seating and planting would not begin until permission to settle was given by the assembly (Rountree 1990). The ban was officially repealed in 1649, and an order was issued for the Native American lands to be defined and marked. This was not done in the area that became Lancaster County until 1653 (Warner 1965). The lifting of the ban on settlement of the Northern Neck was likely precipitated by increasing demand for more land for settlers (Horn 1994; McCartney 1993; Stanard 1902). After 1649, the patenting of land was swift and settlement followed, though somewhat more slowly, possibly because of the continued presence of Native Americans in the Northern Neck (Wheeler 1972). There were still English/Native Americans conflicts with the in the Northern Neck as evidenced by several shooting incidents at this time (Wheeler 1972).

In England, events were occurring that eventually would affect the Northern Neck colonists. In 1649, as an outcome of Cromwell's victory in the British Civil War, Charles I was deposed and beheaded. His son, Charles II, fled to France. There he made a gift of proprietorship of Virginia's Northern Neck to seven of his father's Royalist supporters, even though he was not in a position to enforce it (Freeman 1948; Haynie 1959; Smith 1969).

England became a commonwealth under the leadership of Cromwell. Virginia (along with Ireland and Scotland) attempted to maintain loyalty to Charles II (Harrison 1964). This resulted in increased immigration of loyalists (called Cavaliers) to the Royalist-dominated Northern Neck in general (Beale 1967; Freeman 1948; Warner 1965) and Lancaster County in particular (Horn 1994). In 1652, the colony was forced to submit and give allegiance to Cromwell and the Commonwealth of England (Harrison 1964; Warner 1965). But in 1660, following Cromwell's death, Charles II was restored as monarch. The following year he officially validated the Northern Neck Proprietary (Billings et al. 1986; Freeman 1948; Gray 1987; Haynie 1959). Under its terms, land in the Northern Neck would be granted only through the proprietors or their agents, and annual quitrent payments to the proprietors then would be required of the grantees (Freeman 1948).

By 1661, 576 headright patents had been made in the Northern Neck, granted not through the proprietary, but by the governor of the colony (Freeman 1948; Haynie 1959). When news of the proprietary reached Virginia, there was great confusion among these property owners as to the validity of their titles (Freeman 1948; Haynie 1959). In 1669, after protests were made to Charles II, he issued a revised charter for the proprietary which stated that all patents made prior to 1661 would be valid, provided the grantee was in actual possession of the land by 1669 (Freeman 1948).

After 1649, as indicated by the number of land patents, the population of the Northern Neck increased rapidly, spreading up the estuaries (Harrison 1964; Hodges 1993; Horn 1994). By 1650 more than 70 patents totaling 55,000 acres had been issued in the area that was to become Lancaster County (Wheeler 1972). As English settlement spread throughout the Northern Neck toward the fall line, the Northumberland County government could not function logistically over such distances, and the creation of a new county was required (Beale 1967; Wheeler 1972). In 1651 Lancaster County was formed from portions of Northumberland and York counties (Gouger 1976; Hening 1809–1823; Hiden 1957; Nugent 1983; Peirce 1951; Robinson 1916; Vogt 1985; Warner 1965). By then, more than half of its land had been patented (Horn 1994).

The early phase of Lancaster County's history involved the formation of a rudimentary society as settlers moved into the area, tobacco was planted, the economy boomed, and the population grew (Wheeler 1972). The most densely populated part of the Rappahannock River's north shore, with at least 200 inhabitants by 1650, was the Corrotoman River region (Friis 1940; Warner 1965). This can be seen through study of the many land grants close to the Davis Site that were made in this period (Nugent 1983) and by the 1653 tithables list, which show 20 households reporting 83 tithables in the area (Horn 1994).

By 1652 a total of 123,000 acres had been patented throughout Lancaster County (Horn 1994:Figure 11; Wheeler 1972). From 1653 to 1656, a great influx of settlers is shown by an increase in the total number of households, from 93 to 165 (Wheeler 1972). During this time, 64% of the households had more than two tithables, indicating the presence of indentured servants and/or slaves (Wheeler 1972).

It was inevitable that the increasing numbers of English would lead to land conflicts with the Native Americans. A 1652 act passed by the assembly required that land be set aside for the Native Americans, with 50 acres to be allocated to each "bowman" (Billings 1975). In the lower Northern Neck, 4,400 acres between Dividing Creek and what now is Indian Creek was surveyed for the Native Americans of Northumberland and Lancaster counties (Potter 1976). In addition, Lancaster County's problems with Native Americans were lessened by a 1653 treaty with the Rappahannock tribe (Wheeler 1972). Nevertheless, in 1654 there were still Native American troubles in Lancaster County as the assembly ordered a militia to be formed from local residents for defense of settlers in the county (Beale 1967; Haynie 1959). In 1655 there were about 352 Native Americans living on the land that had been assigned to them in the county (Potter 1976). Although there is archeological evidence of Native American occupation of the Davis Site, the fact that it was patented by an Englishman in 1650 is good indication that it had been abandoned by the Native Americans by that time.

As Lancaster County's population continued to grow, it was subdivided in 1655 into two parishes for the establishment of churches (Beale 1967). By 1656, its westward growth warranted the formation of a new county, old Rappahannock, which was split off of Lancaster County (Beale 1967; Gouger 1976; Hening 1809–1823; Peirce 1951; Robinson 1916; Vogt 1985; Warner 1965).

The Corrotoman River area continued to be the center of settlement in Lancaster County. It was the site of the county's first courthouse and jail, built in 1655–1657 (McCartney 1993). It was on the Corrotoman, near the Millenbeck plantation, that a fort was to be built in 1667 for protection from Dutch ships (Warner 1965). It was on John Carter's Corotoman plantation that the first Christ Church was built in 1669 (Wilson 1984). Herrman's (1673) map of 1670, which is quite accurate when compared to known archeological sites (Smolek et al. 1984), indicates the Corrotoman River area was densely settled by this time (Figure 3). Queenstown was laid out on the Corrotoman in the 1690s, to be Lancaster County's "Port of Entry and Exit" and its first urban settlement (McCartney 1993). Based on the number of tithables (Greene and Harrington 1932), this area of Lancaster County had at least 400 inhabitants by 1675 and 1,400 by 1700 (Friis 1940). Other areas of Lancaster also continued to grow, though not as rapidly as the Corrotoman area. The number of tithables in all of Lancaster increased from 380 in 1653 to 945 by 1663 (Horn 1994).

From 1657 to 1669, 284,000 acres were patented or exchanged in Lancaster, the number of households increased by 19%, and the number of tithables increased by 25% (Wheeler 1972). As most of the land in Lancaster

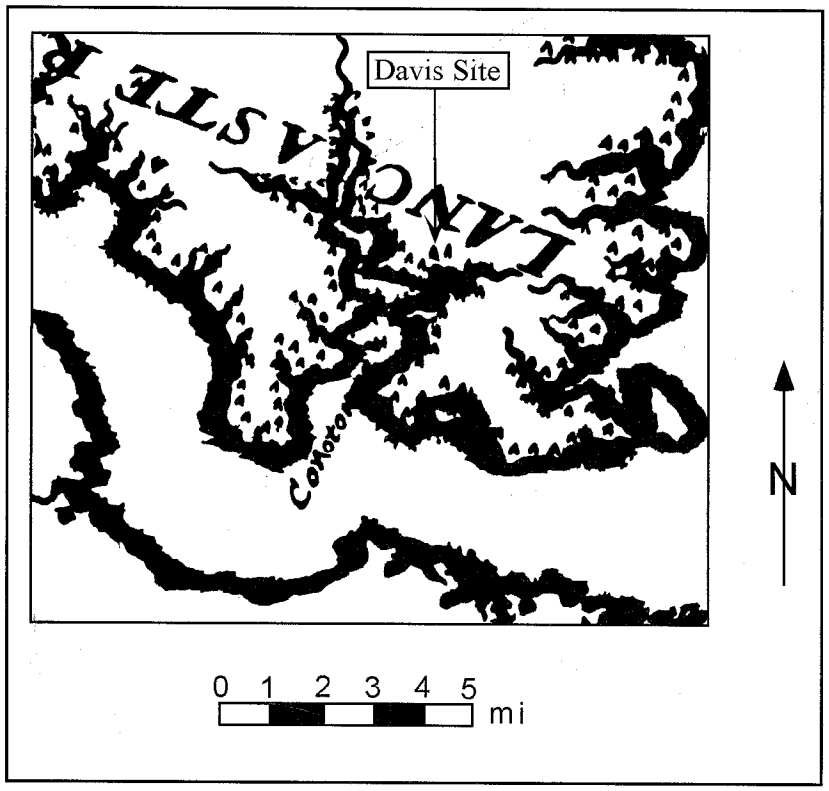

Figure 3. Herrman's 1670 map of the southeastern part of the Northern Neck showing the location of Davis Site relative to the colonial settlements. Modified from Herrman (1673).

County had been taken up by 1669 (Freeman 1948; Nugent 1983), new patents accounted for only 13% of this total (Wheeler 1972). But from 1669 to 1680, the county's growth slowed because of Native American problems to the northwest, Bacon's rebellion, and depressed tobacco prices (Wheeler 1972). By 1675, all of Virginia east of the fall line was to some degree dotted with English settlements (Billings et al. 1986).

As for the Native American population of Lancaster during this time, there is only circumstantial evidence that by the 1660s most of them had either died, were living on the designated land, or had moved further westward. A census taken in 1669 revealed that no Native Americans then lived in Lancaster county (Wheeler 1972). This is supported by the lack of references to them in the Lancaster court records (Fleet 1988). In all of the lower Northern Neck, by 1675, there were probably only a few Native Americans left on the plantations as semi-slaves (Dalton 1974b), and in a few small tribal units near Tappahannock (Warner 1965). By 1700, the Native Americans had retreated west of the Blue Ridge (Haynie 1959), and there may have been as few as 612 in the entire Chesapeake area (Emerson 1988). Those who remained were acculturated into English colonial society as slaves, servants, indentured servants, or freemen (Hodges 1993; Potter 1976). The Owings Site in the Northern Neck is interpreted as one place where such acculturation occurred (Dalton 1974b; Potter 1977).

When war erupted again in the Northern Neck in 1675 (Warner 1965), it was restricted to the headwaters of the Rappahannock far to the west in Stafford County near Port Royal (Billings et al. 1986; McLearen et al. 1995; Warner 1965). From the Chesapeake Bay to the fall line, the Native American villages had been replaced by scattered communities of settlers by 1676 (Billings et al. 1986). Attacks by Native American in 1676 were restricted to the fall line indicating the Native Americans had moved well west of Lancaster County (Billings et al. 1986; Warner 1965). After Bacon's rebellion, the Native Americans were forced into another treaty in 1680 extending English control of the Northern Neck further west to the headwaters of the Rappahannock River (McLearen et al. 1995).

Results from the Historical Records Research

Tracing the ownership of the Davis Site indicated the property was first owned by John Mangor in 1650. The second owners were the Fenns, and they sold it to Thomas Buckley by 1674. The site probably was not occupied by Mangor or the Fenns, as their names do not appear in the tithables lists for Lancaster County during those years (Jones n.d.). This was not uncommon as roughly a third of the early patents in Lancaster County were vacant (Wheeler 1972).

Historical records indicate that Buckley was in Lancaster County by 1669 and was a property owner by 1670. Roughly one third of Lancaster County's early settlers came from other parts of Virginia, and two thirds came directly from England, especially from the southern counties (Horn 1994). Buckley fits this pattern well as he probably emigrated from the Isle of Wight county in Hampshire, England. Most settlers came to Lancaster County because it was the last place to obtain prime tobacco growing land and because they had a family

connection there (Horn 1994). The latter was true for Buckley as his aunt's husband was in the county by 1653.

By 1674 Buckley had purchased the 400 acres that incorporated the Davis Site. The fact that this sale is recorded five years after Buckley moved to Lancaster County suggests that Buckley may have been living elsewhere in the county, that Buckley may have been renting the property from the previous owners, or that the purchase had been made earlier, perhaps soon after Buckley's arrival, but a deed was not given until 1674.

By Billings et al.'s (1986) definition of colonial Virginia social classes, Buckley was a middle rank planter who left England with enough capital to acquire indentured servants, land, and, eventually, other servants or slaves. Life expectancies in this class were short. Up to a third of children lost at least one parent, and orphanhood blurred traditional nuclear family arrangements such that uncles, aunts, brothers, sisters, or other legal guardians often became parental figures (Billings et al. 1986).

Thomas Buckley and his wife, Frances, had one daughter who married Robert Hill. She had three children who survived both their parents, leaving Thomas Buckley and his wife to care for them. Buckley wrote his will in 1702 and died soon afterward. The site was probably abandoned after Frances Buckley died in 1703. Thomas Buckley had provided for the grandchildren to be raised by his brother-in-law, Richard Stephens. It is probable that Stephens took the children to his home after Frances Buckley's death. Thus, based on court records, the Davis Site probably was occupied from 1669 to 1703 (mean date = 1686) by Thomas Buckley, his wife, daughter, three grandchildren, and various freemen/servants.

Some of Buckley's servants may have been African. As the number of indentured servants declined as a result of both depressed tobacco prices in the colonies and improved wages in England, Africans were imported to the colonies to provide the labor for tobacco (Menard 1988). From the time English colonists first began to inhabit the Northern Neck, many tobacco plantations were established (McCartney 1993). There were African slaves in the Northern Neck by 1649 (Horn 1994) and in Lancaster County at least by 1653 (Wheeler 1972). At least 69 slaves entered the county by 1654 and another 141 before 1660 (Horn 1994). They became a major part of Lancaster County's population after 1660 (Billings et al. 1986). From 1680 to 1720, the labor force in the county came to be dominated by African slaves (Kulikoff 1986; Wheeler 1972). This was in the time that Thomas Buckley had servants in his household, therefore, it is probable that some of them were African.

Although records do not indicate the exact position of Thomas Buckley's dwelling on his original 400 acres, there are three pieces of compelling circumstantial evidence to conclude that it was on the Davis Site. Present-day Hills Creek was called Tinkers Creek, suggesting that someone living adjacent to Tinkers Creek (i.e., Thomas Buckley) had worked with metals and was called a tinker by his neighbors. Regular and extensive farming has not revealed others sites.

Also, the location of the Davis Site meets six of the criteria used by colonists in selecting sites. First, the Davis Site may have a Native American component, as evidenced by the presence of Native American artifacts in the surface collections. English colonists in the Chesapeake region often chose dwelling sites that had been previously cleared of trees by Native Americans (Humphries 1991; Potter and Waselkov 1994). These "Indian fields" were considered the choicest spots for a tobacco farm (Billings et al. 1986). This relationship between the location of contact period Native American and European American sites has been suggested for the Northern Neck in general (Potter and Waselkov 1994) and Lancaster County in particular (Horn 1994; Wheeler 1972). For example, nearby Millenbeck was a colonial site built on a previous Native American village (Mann 1974).

Second, it was important to have a navigable waterway close by for transportation (Harrison 1964). Most dwellings were built adjacent to estuaries that were deep enough to allow ships to dock at a wharf (Gouger 1976). This provided access to the Chesapeake Bay ship masters who sold their wares from creek to creek and purchased the settlers' cash crops (Edwards and Brown 1993; Harrison 1964; Horn 1994). This was especially true for the Northern Neck (Puglisi 1989). The first settlements in Lancaster County were along the navigable estuaries, and the typical land grants usually contained a creek as one of its boundaries (Wheeler 1972). By 1670 the shores of navigable estuaries in the Chesapeake were dotted with settlements (see Figure 3). Fifty-one percent of known sites from the 1600s in the Chesapeake region are within 150 m (500 ft.) of navigable waters, and 73% are within 300 m (1000 ft.) (Smolek et al. 1984). The Davis Site meets these criteria as it is currently 65 m (210 ft.) from the navigable Eastern Branch of the Corrotoman River and is bounded by navigable creeks to the southwest and northeast (see Figure 2).

Third, most colonial houses were built on high spots adjacent to estuaries (Gouger 1976). Such locations pro-

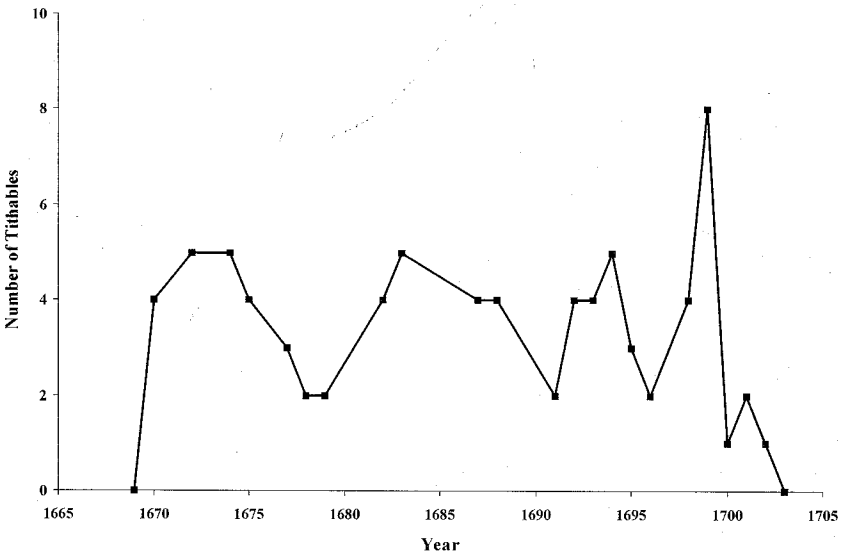

Figure 4. Davis Site (44LA46), number of tithables in Buckley household from 1669–1703 (from Jones n.d.).

vided good drainage, air circulation, and views. Forty-six percent of known sites from the 1600s in the Chesapeake region are within 3 m (10 ft.) elevation of sea level, and 80% are within 9 m (30 ft.) (Smolek et al. 1984). The Davis Site is at an elevation of 9 m (30 ft.) and has good drainage, air circulation, and views up and down the Corrotoman all the way to the southern shore of the Rappahannock River.

Fourth, colonists usually chose sites near freshwater springs for drinking water (Edwards and Brown 1993; Horn 1994). A productive spring is located 115 m (375 ft.) from the site.

Fifth, colonial site selections were based on good soil (Edwards and Brown 1993; Horn 1994). The Sassafras loamy fine sand soil at the site is one of the most productive in the area (Elder et al. 1963).

Sixth, proximity to neighboring households was an important criterion used in selecting colonial dwelling sites (Edwards and Brown 1993; Horn 1994). The Davis Site was adjacent to at least one contemporaneous household belonging to the Edmonds family.

Tithable rolls often provide corroborating evidence for determining dates of occupation for historic sites. In the period when Thomas Buckley had servants, free males over the age of 16 were tithable, and remained so until age 60 (unless they were physically or mentally handicapped). Slaves (both male and female) of certain ages (which varied from time to time) also were tithables (Nugent 1983). Thomas Buckley's tithables show that the site was occupied from 1670 to 1702 (Figure 4) with a mean date of 1686 and a weighted mean (by number of tithables) of 1687. The tithable population at the Davis Site varied from one in 1700 and 1702 to eight in 1699. Why did the number of tithables drop so drastically from the maximum of eight in 1699 to the minimum of one a year later in 1700? Perhaps Buckley became ill, as he does not show up in the court records from 1699 to 1702, and he died in late 1702 or early 1703, only two years after the large drop in tithables. With an annual average of 3.5 tithables, the Buckley household was small compared to most Lancaster County households, which typically had more laborers (Horn 1994). On small to middling plantations with 3–4 laborers such as Buckley's, the laborers would have undertaken the same tasks as their master (Horn 1994).

Results of Artifact Analysis

The surface yield included 717 clay tobacco pipe fragments consisting of 594 pipe stem fragments with measurable bore diameters, 104 pipe bowl fragments, and 19 relatively complete pipe bowls. In addition, Native American pottery, points, and flakes, as well as oyster shells, various animal bones, ceramic pottery sherds, bottle glass, gunflints, small pieces of non-glazed bricks, and other miscellaneous material was found. This study is only concerned with the pipe fragments as they are the most abundant artifacts.

Pipe Stem Results

Are 594 pipe stems enough for dating the site? To answer this, the stem bore diameters were randomly sorted, and the cumulative, mean bore diameter was calculated starting with the inclusion of just one stem and ending with all 594 stems. A stable mean (6.8/64 in.) was achieved after 268 fragments. Because the total 594 fragments measured is more than twice this amount, the calculated mean bore diameter is considered robust.

How many complete pipes do 594 stem fragments constitute? If there were only 19 complete pipes at the site, as indicated by the number of relatively complete bowls found, then each pipe would have yielded 31 stem fragments. But this is unlikely for two reasons. First, the number of bowls undoubtedly was higher than 19 as indicated by 104 bowl fragments. Second, as the mean stem fragment length was 32.6 mm (range = 7–101 mm, s.d. = 12.4) (Figure 5), this would suggest a mean pipe

length of over 100 cm. Pipe lengths at this time were typically only 30 cm (11–12 in) (I. Noël Hume 1969). In Williamsburg the ratio of stem fragments to bowls indicates each pipe on average broke into roughly 15 pieces (I. Noël Hume 1969). Assuming this ratio, the 594 stem fragments represent 40 complete pipes. Undoubtedly, there are several orders of magnitude more pipes than this as the collecting was restricted to the surface.

The bore diameters of the 594 pipe stem fragments ranged from 4/64 to 9/64 in. (mean = 6.8/64 in., s.d. = 0.77) (Figure 6 and Table 1). There was no significant correlation between stem bore diameter and stem fragment length ($R^2 = 0.0029$; $P > 0.05$). This suggests there was no systematic bias in the stem fragment sample due to pipes with certain bore diameters having a greater tendency to fragment, thereby increasing the representation of that bore diameter in the sample.

Based on the location and age of the Davis Site, as well as bowl shapes (as no Dutch bowls were found), the use of the Harrington technique is justified. Results of the various age equations are listed in Table 2. Harrington's original histograms suggest a range of occupation from 1650–1680. The standard deviation of pipe stem bore diameters is a rough measure of the duration of the site's occupation (Binford 1962; Pogue 1991). This is the approach used in Binford's (1972) calculation, which yields a range of 1657–1687. A precipitous decrease in the frequency of bore diameters away from the mean suggests a rapid occupation and abandonment of the site. A wide range of pipe stem bore diameters suggests an extended period of deposition/accumulation and a longer occupation for a site. Based on previously published pipe stem bore diameter frequency histograms like Figure 6, our distribution indicates a multiyear occupation of the site. A skewed

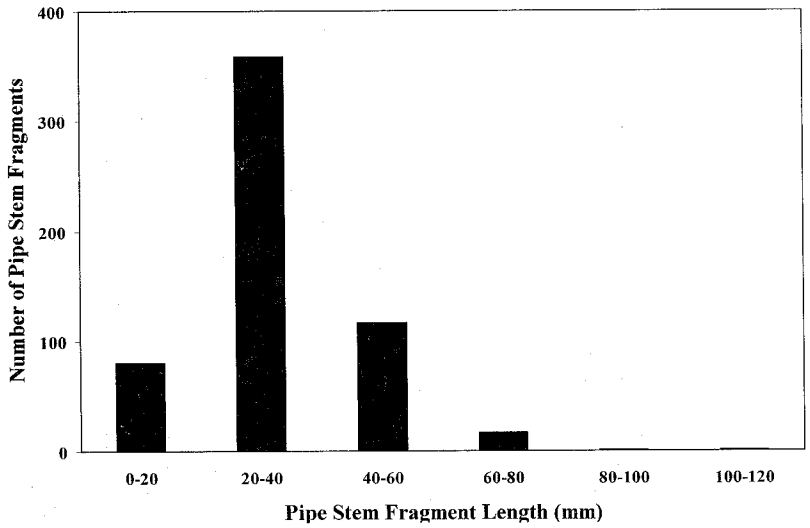

Figure 5. Davis Site (44LA46), frequency histogram of pipe stem fragment length.

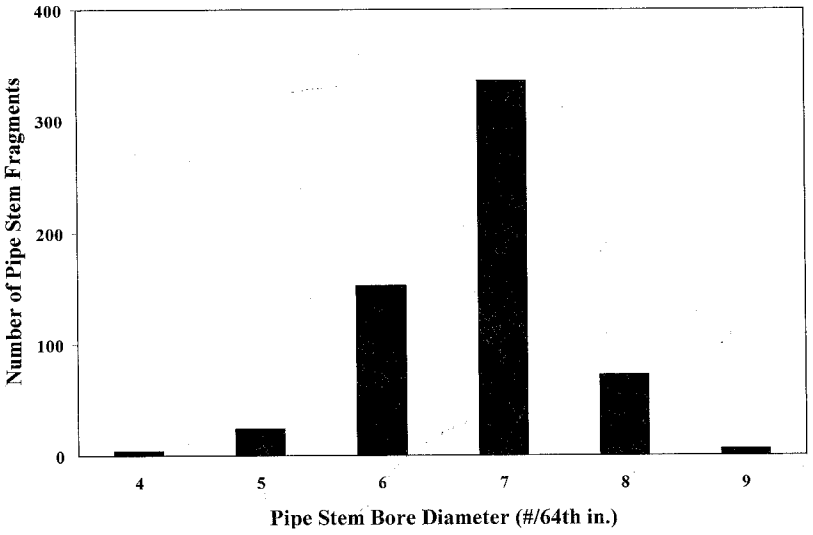

Figure 6. Davis Site (44LA46), frequency histogram of pipe stem bore diameter.

Bore Diameter (No./64 in.)	No. of Fragments	% of Total Fragments
4	4	0.7
5	24	4.0
6	152	25.6
7	336	56.6
8	72	12.1
9	6	1.0
Total	594	100.0

Table 1. Davis Site (44LA46), pipe stem bore diameters (also see Figure 7).

distribution of pipe stem bore diameters may indicate an uneven temporal distribution of the site's population. If a site had a larger population during certain years of its entire occupation, the pipe collection could be dominated by a proportionally larger sample from that time. As Binford (1962) warned, this would skew the mean age of the entire site in the direction of the larger population. Our sample had a skewness of –0.36 indicating slightly more stems with smaller bore diameters. This could be caused by an increasing rate of deposition of pipe stems over the life of the site due to increasing population. The number of tithables (see Figure 4), however, indicates a slight decrease in the population at the site over time, but it was insignificant statistically ($R^2 = 0.04$, $P > 0.05$).

Based on the calculated ages of occupation (see Table 2), the site has a mean occupation date from 1671 (Cresthull 1972:linear equation; Hanson 1971:1650–1800 equation) to 1688 (Heighton and Deagan 1972). Thus, the pipe stem bore diameters indicate a maximum range of occupation from 1650–1688 with a mean of 1674 (see Table 2).

Pipe Bowl Results

The colors, dimensions, and stem bore diameters of the 19 relatively complete pipe bowls are reported in Table 3. The colors included white (n =13, 68% of total), pink (n =2, 11%), pale yellow (n = 2, 11%), light yellowish brown (n = 1, 5%), and light gray white (n = 1, 5%). Two terra cotta pipes were found (Figures 7.1–7.2). These represent the two basic types of locally made terra cotta pipes (i.e., mold-made and handmade, respectively). The two types are difficult to distinguish, and many presumed handmade pipes probably were mold-made (Deetz 1993). The mold-made terra cotta pipes (e.g., Figure 7.1) were presumably made with molds imported from Europe using indigenous clays (Deetz 1993; Emerson 1988, 1994; Kelso 1984; Mitchell 1983). These pipes have a distinctive European bowl shape (Henry 1979; Miller 1983) and relatively consistent, symmetrical dimensions (Emerson 1988). It was suggested originally that the mold-made terra cotta pipes were manufactured by Native Americans or European colonists (Henry 1979; Miller 1983, 1991; Pogue 1991). But Emerson (1988, 1994) argued that pipe making was not a stable livelihood for American colonists in the 1600s. In fact, only one English pipemaker has been documented as practicing in the Chesapeake regions during the colonial period (Emerson 1988, 1994).

The handmade terra cotta pipes (e.g., Figure 7.2) often have distinctive design elements consisting of patterned indentations in the form of a horned, quadrupedal animal. This pattern is often referred to as the Running Deer motif (e.g., Emerson 1994:Figures 3.2c, 3.5a). Once again it was originally attributed to Native Americans or European Americans that were making pipes in the Native American style for trade (Harrington 1951; Henry 1979; Kelso 1984; Miller 1983; Mitchell 1983; Mitchell and Mitchell 1982; Pawson 1969; Pogue 1991; Schmitt 1965; Smolek et al. 1984; Stewart 1954). Native Americans were making clay tobacco pipes before and during English contact (Emerson 1994), but the Running Dear motif has most recently been attributed to African-Americans (Deetz 1993; Emerson 1988, 1994) or a unique Creole culture of Native Americans, Europeans, and African-Americans (Mouer 1993).

All of the white clay pipes found at the site (Figure 8.9–8.15; see Figure 7.3–7.8) were interpreted to be English in origin. None were identified as Dutch as they lacked the Dutch "belly bowl" or "funnel bowl" shapes (McCashion 1979; Miller 1991). One pipe (see Figure 7.1) had a "belly bowl"–like shape, but its terra cotta color suggests a local source, not a Dutch import. Dutch pipes were more common in Colonial sites during the British civil wars (1640s and 1650s), as the Dutch increased trade with the colonies to fill the void in shipping manufactured goods into the Chesapeake region and tobacco out (Bruce 1895; Craven 1970; Menard 1975). Dutch trade in the colonies was greatly reduced by the Navigation Acts of 1650 and 1651 (Kelso 1984; Menard 1975) as well as the second (1664–1667) and third (1672–1674) Anglo-Dutch wars (Kelso 1984; Riordan 1991). The absence of Dutch pipes suggests a date for the Davis Site before, or more likely, after these dates. A similar trend occurred in Maryland where Dutch pipes became rare after about 1660–1670 (King 1991; Miller 1983; Pogue 1991; Riordan 1991).

All but one of the white clay pipes were from Bristol manufacturers. The one non-Bristol pipe (see Figure 7.4)

Equation	Reference	Calculated Mean Site Age
Original histograms	Harrington 1954	1650–1680
Y = 1931.85 – 38.26X	Maxwell and Binford 1961; Binford 1962	1672
Y = 1929.189 – 36.818X	Omwake 1967	1679
Y = 1891.64 – 32.09X	Hanson 1971 (1620–1680)	1674
Y = 1880.92 – 30.70X	Hanson 1971 (1620–1710)	1673
Y = 1869.31 – 28.88X	Hanson 1971 (1650–1710)	1673
Y = 1887.99 – 31.66X	Hanson 1971 (1620–1750)	1673
Y = 1888.06 – 31.67X	Hanson 1971 (1650–1750)	1673
Y = 1919.10 – 36.06X	Hanson 1971 (1620–1800)	1674
Y = 1930.24 – 38.23X	Hanson 1971 (1650–1800)	1671
1962 equation + SD range	Binford 1972	1657–1687
Y = 1904.92 – 34.056X	Cresthull 1972 (linear)	1674
Y = 2058.41 – 466.47Log(X)	Cresthull 1972 (curvilinear)	1671
Y = 1600 + 22((1.04435 – LOG(X))/0.05324)	Heighton and Deagan 1972	1688
	Minimum:	1650
	Mean:	1674
	Maximum:	1688

Table 2. Davis Site (44LA46), calculated dates of occupation based on stem bore data from Table 1 using previously published equations (Y = calculated age of site; X = mean stem bore diameter in 64ths of an inch).

Pipe No.	Munsell Color	Lip Thickness (mm)	Bowl Height (mm)	Mouth Diameter (mm)	Stem Bore Diameter (No./64 in)
1	Pink (7.5YR7/4)	1.8	38.0	16.8	7
2	Light yellowish brown (10YR6/4)	Broken	Broken	Broken	8
3	White (2.5Y8/1)	2.0	36.0	15.1	8
4	White (2.5Y8/1)	Broken	Broken	Broken	8
5	White (2.5Y8/1)	2.5	41.7	14.7	6
6	Pale yellow (2.5Y8/2)	1.8	39.0	14.2	5
7	White (2.5Y8/1)	1.8	37.4	16.1	7
8	White (2.5Y8/1)	1.8	33.6	15.1	7
9	White (2.5Y8/1)	2.6	36.4	16.3	7
10	White (2.5Y8/1)	2.8	36.7	15.6	7
11	White (2.5Y8/1)	2.8	34.3	Broken	6
12	White (2.5Y8/1)	2.5	36.8	16.6	7
13	White (2.5Y8/1)	1.9	37.7	16.3	Broken
14	White (2.5Y8/1)	2.3	39.3	16.6	6
15	White (2.5Y8/1)	2.7	39.0	16.1	6
16	Pale yellow (2.5Y8/2)	Broken	Broken	Broken	6
17	White (2.5Y8/1)	2.0	36.4	15.9	6
18	Pink (7.5YR7/4)	Broken	Broken	Broken	Broken
19	Light gray (2.5Y 7/2)	Broken	Broken	Broken	16*
Number	19	14	14	13	16
Minimum	Light gray (2.5Y7/2)	1.8	33.6	14.2	5
Mean	White (2.5Y8/1)	2.2	37.3	15.8	6.7
Maximum	Light yellowish brown (10YR6/4)	2.8	41.7	16.8	8

* stem bore diameter measurement was excluded from all calculations as this pipe used a reed stem that was inserted into the bowl.

Table 3. Davis Site (44LA46), colors, dimensions, and stem bore diameters of the most complete pipe bowls.

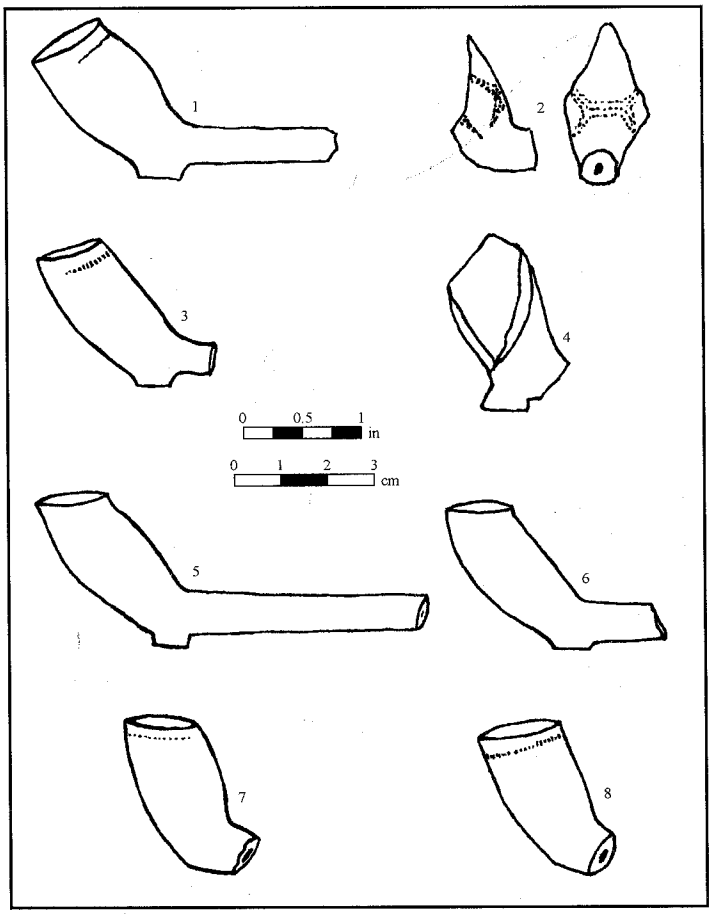

Figure 7. Davis Site (44LA46), pipe bowls 1–8. Specimen 2 shown with two mutually perpendicular views to show detail of running deer motif.

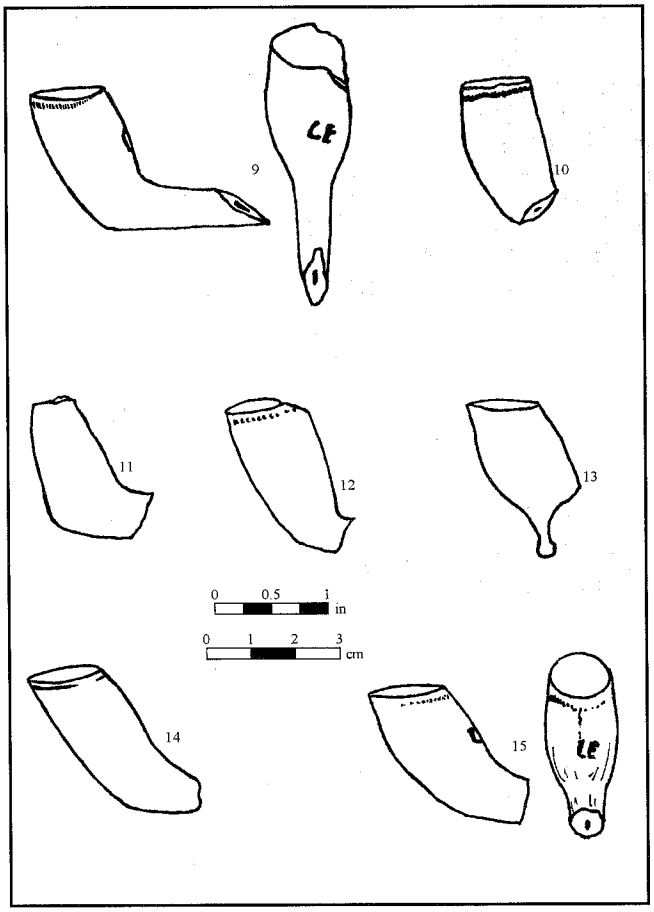

Figure 8. Davis Site (44LA46), pipe bowls 9–15. Specimens 9 and 15 shown with two mutually perpendicular views to show detail of makers' marks.

was made in Broseley. These cities were two of the five main pipe making centers of England (Oswald and James 1955).

Four distinctly younger pipes (Figures 9.16–9.19) were found on the Davis Site. One has a female bust on the bowl (see Figure 9.16) and is much younger, as this bowl type is also found well to the west in Louisville, Kentucky (Sudbury 1979:Plate 30, Figure 9). Another (see Figure 9.17) has a more recent style with the bowl at almost a right angle to the stem. Finally, two (see Figures 9.18–9.19) have the distinctive furrowed bowls with rounded elbow joints of Pamplin pipes. Three of the bowls (see Figures 9.17–9.19) used a reed for a stem rather than the integrated stems in the other bowls. These four anomalous bowls are interpreted as coming from a much younger occupation of the site documented in the oral history by Davis (1994) and are, thus, excluded from the rest of the study.

Excluding the four younger bowls and the two terra cotta bowls leaves 13 conventional colonial white clay tobacco pipes (see Figures 7.3–7.8 and 8.9–8.15). Of these 13, eight (62%; see Figures 7.3, 7.7, 7.8, 8.9, 8.10, 8.12, 8.14, and 8.15) had rouletting around the rim of the bowl. This suggests a date for the Davis Site in the late 1600s. Of these 13, one (8%; see Figure 8.13) was spurred, four (31%; see Figure 7.3–7.6) were heeled, and eight (62%; see Figure 7.7, 7.8, 8.9–8.12, 8.14 and 8.15) were of the heelless, spurless, American export type. This suggests a date for the Davis Site before 1690.

Including only the colonial bowls (see Figures 7.1–7.8 and 8.9–8.15), the maximum range of dates for the site from published bowl typologies is 1630–1820 (Table 4). Using the ranges for each of the nine bowl types and weighting them for the number of bowls in each bowl type (e.g., the bowl type represented by Figures 7.7–7.8 and 8.9–8.12 was weighted six times the bowl type represented by bowl in Figure 7.1), the mean date of occupation is 1696 (see Table 4).

Makers' Marks

Ten makers' marks were found, representing 1.4% of the pipe fragments found. Makers' marks were very rare

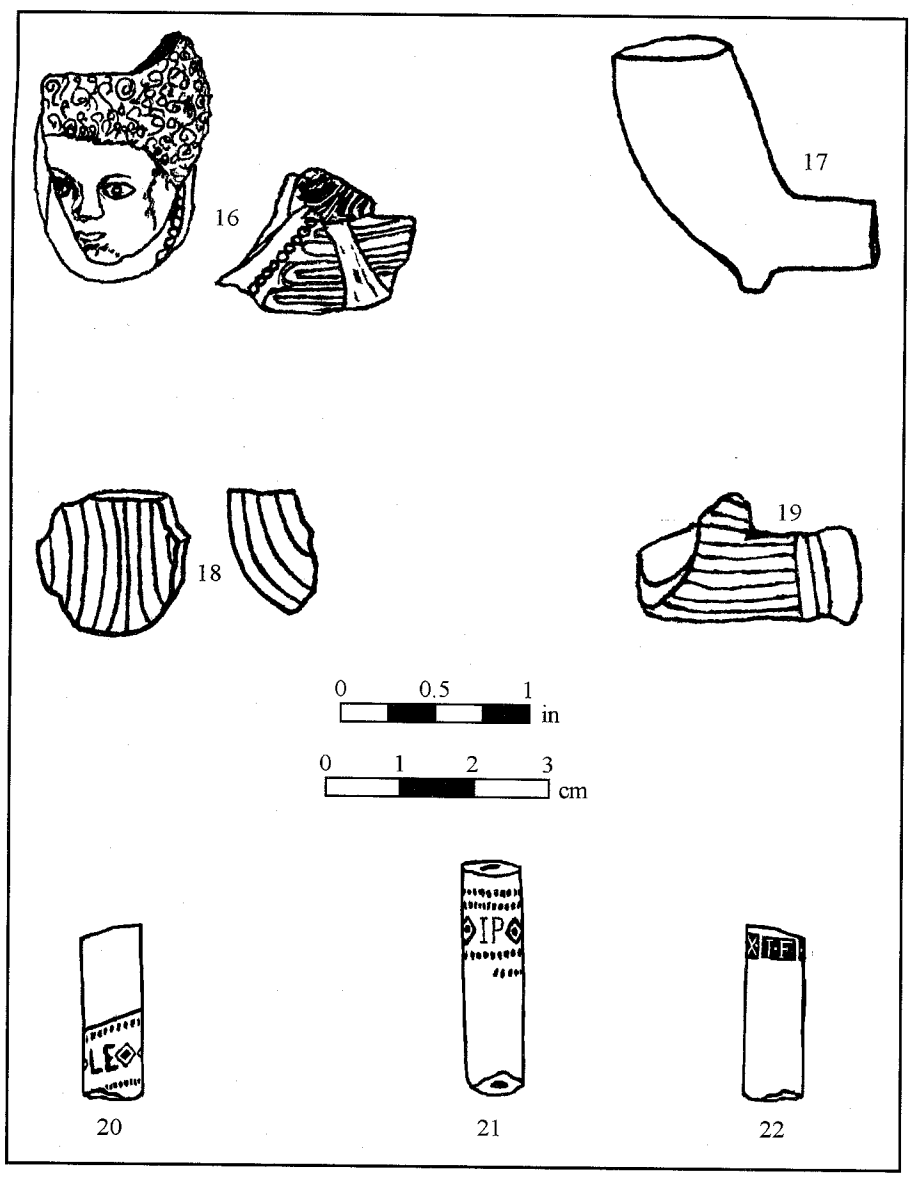

Figure 9. Davis Site (44LA46), pipe bowls 16–19 and stem fragments 20–22. Specimen 16 consists of two broken pieces. Specimen 18 shown with two mutually perpendicular views to show detail of ornamentation.

at our site as at many colonial sites. The use of makers' marks was most common in the first half of the 1600s (Walker 1966). As the Davis Site has few makers' marks, it suggests an occupation date in the later 1600s.

Three identifiable makers' marks were found: IP, IF, and LE. The IP mark occurred on three stem fragments (e.g., Figure 9.21) and is similar to that figured by Hurry and Keeler (1991:Figure 12j). The IP mark is not useful in dating sites as there were more than 100 manufacturers in 27 English cities using that mark from 1632 to 1970 (Oswald 1960, 1975; Walker 1977).

One IF makers' mark was found on a stem fragment (see Figure 9.22) similar to that figured by Hurry and Keeler (1991:Figure 12i). The IF makers' mark is attributed to James Fox of Bristol, England who produced pipes under that mark from 1651 through at least 1696 (Oswald 1975; Walker 1977). The IF mark has been found at other colonial sites in Virginia (Kelso 1966, 1967; I. Noël Hume 1968), Maryland (Hurry and Keeler 1991), New Jersey (Cross 1941), and Maine (Walker 1977).

Six LE makers' marks were found. Two were on the backs of bowls facing the stems (see Figure 8.9 and 8.15) similar to those figured by Walker (1977:1429, Figure d), Alexander (1979:48, Figures 6.1–6.3), and Pogue (1991:Figure 12G). Four occurred on stem fragments (e.g., Figure 9.20) surrounded by a band of impressed diamonds encircling the stem. These are similar to those figured by Walker (1977:1429, Figure d), Alexander (1979:48, Figures 6.5–6.7), Hurry and Keeler (1991:Figures 12a–b), King (1991:Figure 5E), and Pogue (1991:Figures 13A–B). The LE makers' mark is attributed to Llewellin (or Lluellin) Evans of Bristol, England who produced pipes under that mark from 1661 to 1688/89 (Oswald 1960, 1975; Walker 1977). It is interesting to note that Llewellen Evans apprenticed under James Fox (Oswald 1975; Walker 1977) whose mark also was found at the site.

The LE mark has been found on pipes from other colonial sites in New Brunswick, Maine, Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia, and Jamaica (Walker 1977). In Maryland, LE marks have been found at the Abell's Wharf Site (Humphries 1991), the Buck Site (Omwake 1967), the Mattapany-Sewall Site (Pogue 1991; Smolek et al. 1984), the St. Inigoes Manor Sites (King 1991), and St. Mary's City (Miller 1983). In Virginia, they have been found at the Green Spring Plantation (Caywood 1955; Crass 1988), Hallowes Site (Buchanan and Heite 1972), Jamestown (Peck 1967), and the Nominy Plantation (Mitchell 1976, 1983).

The datable marks (Table 5) indicate an age range for the site of 1651–1696 with a weighted mean of 1675. All of the identifiable makers' marks were from Bristol,

Pipe No(s)	No. of Bowls	%	Age Range	Mean Age
1	1	6.7	1640–1702	1660
2	1	6.7	1630–1727	1671
3	1	6.7	1650–1712	1680
4	1	6.7	1640–1732	1684
5	1	6.7	1680–1720	1696
6	1	6.7	1680–1720	1697
7–12	6	40.0	1680–1730	1701
13	1	6.7	1680–1780	1715
14–15	2	13.3	1680–1820	1718
Total	15	100		
Range	1–6	6.7–40.0	1630–1820	1660–1718
Mean	1.7	11.1		
Weighted mean				1696

Table 4. Davis Site (44LA46), summary of estimated dates of occupation based on pipe bowl age determinations using previously published bowl typologies.

Makers' Mark Mark	No. of Marks Found	%	Range of Production Dates	Mean Production Date
IF	1	14	1651–1696	1674
LE	6	86	1661–1689	1675
Total	7	100		
Range	1–6	14–86	1651–1696	1674–1675
Mean	3.5	50		
Weighted Mean				1675

Table 5. Davis Site (44LA46), estimated dates of occupation based on makers' marks.

England manufacturers. Most Virginia tobacco entered England through Bristol, and most European goods were shipped to Virginia out of Bristol (McGrath 1955). Perhaps in response to this, Bristol manufacturers dominated the clay tobacco pipe export market for the North American colonies (Mitchell 1983; Whitehouse 1966). Based on shipping records of Bristol pipes to colonial North America (McGrath 1955) and the distribution of pipes with Bristol makers' marks in colonial North America (Walker 1977), Bristol was probably the largest exporting area of English clay tobacco pipes from 1650 to 1700, and Virginia and Maryland were two of the most common destinations (Atkinson and Oswald 1969; Hurry and Keeler 1991; Miller 1983; I. Noël Hume 1963; Oswald 1959a, 1960, 1970, 1975). This supports the age of our site in the late 1600s. All the makers' marks were attributable to English manufacturers, and this supports the bowl typology results which also indicate the white clay tobacco pipes were imported from England rather than Holland.

Discussion

If the site was occupied during the colonial period, why have we made little mention of other colonial artifacts? First, a trash pit was not discovered, thereby limiting the possibility of pottery or china fragment discoveries. Second, only the tobacco pipes were systematically collected from the colonial occupation to assist in dating the site. Only a few small brick fragments were seen; however, that is not an indication of non-occupation. Buckley's dwelling probably was typical of Northern Neck homes of the late 1600s. The initial dwelling of a typical middle rank planter was often a wooden-floored, frame clapboard dwelling (Billings et al. 1986; Harrison 1964; McLearen et al. 1995; Potter and Waselkov 1994; Smolek et al. 1984). This type of dwelling is known as a "Virginia House" (Carson et al. 1981). These early dwellings, with their earthfast, post-in-the-ground construction, were not intended to be permanent, as many of the colonists envisioned making money through tobacco cultivation and returning to England (Deetz 1988, 1993). Brick construction usually was limited to churches, public buildings, and manor houses of the most prosperous planters (Billings et al. 1986).

In summary, the pros and cons of the various dating techniques have been discussed above, but the best approach is to use as many independent techniques as possible. For the five different techniques used for this study,

General Data Source	Specific Data Source	Range of Dates	Mean Date	Mean Date
Historical documents	Tithable records	1670–1702	1687	1686
Historical documents	Courthouse records	1669–1703	1686	
Archeological artifacts	Pipe stems	1650–1688	1674	
Archeological artifacts	Bowl shapes	1659–1718	1696	1682
Archeological artifacts	Makers' marks	1651–1696	1675	
Total		1650–1718	1683	1684

Table 6. Davis Site (44LA46), summary of estimated dates of occupation based on all data sources.

the results are as follows. Pipe stem bore diameters calculated a mean date of 1674. Pipe bowl shapes indicated a mean date of 1696. Pipe makers' marks suggested a mean date of 1675. Thus, the archeological data indicate a mean date of 1682 (Table 6). The two approaches based on historical documents yielded mean dates of 1686 and 1687 (see Table 6). Thus, the archeological data and the historical data closely matched, giving a mean date for the colonial occupation of the Davis Site of 1684 (with a maximum range of 1650–1718).

Why was there a 21 year difference in the estimated age of the site, as based on the makers' marks (i.e., 1675) and the bowl shapes (i.e., 1696)? There are two possible explanations. First, perhaps this is within the normal variation of these dating techniques. Second, perhaps the older bowls were more fragile, and therefore underrepresented in the bowl sample.

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