Mean Ceramic Dating at Andelot Farm (18KE25) and the Cultural Implications of Colonial North American Ceramics

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Abstract: By studying material culture, the role it plays in understanding the past and the role it plays in dating archaeological sites, we can test the mean ceramic date formula (South 1977) on Andelot Farm (18KE25).

Key Words: Historical archaeology, material culture, ceramic, stratigraphy, material culture, consumerism, processual archaeology, mean ceramic date, pipe stem dating

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TABLE OF CONTENTS

I. Introduction

Archaeology is the study of human history through excavations and analysis of the artifacts left behind by cultures. Archaeology can be broken down, split between the history of pre-literate societies, also known as prehistoric archaeology, and the study of literate societies, also known as historical archaeology (Deetz 1996:4-5).

Within this paper, I will be discussing several aspects of archaeology, including stratigraphy and typology. I will address the use of artifacts as a means of dating a dig site. Finally, I will provide my own research into one site in particular, Andelot Farm, and discuss dating of site features using ceramics. By studying the usage of the mean ceramic date formula, my research will further inform future archaeologists on the site and the possible usages of ceramics in accurately dating the site and its features. With this information, I hope to answer several questions about ceramic usage in archaeological analysis: how are ceramics culturally indicative? Does the mean ceramic dating formula work? If so, what can the mean ceramic date tell us about Andelot?

Foremost to understand is the dichotomy of cultures. The first type of culture is the traditional culture, one that is slow to change and resistant to new technologies. When we think of traditional cultures, we can consider many Amish due to their separation from the digitized world. The second type is popular culture, where people live in a constantly evolving world with new technologies. This cultural type includes modern America, where trends influence everything from purchases to the behavior of citizens. This distinction is important when discussing archaeology, both the preliterate (prehistoric) and literate (historical) cultures.

Focusing on historical archaeology, one can fill a bare-bones timeline with evidence from written records and artifacts. We may know, for instance, that the settlers of Jamestown

struggled to adjust to harsh winters and died from disease, lack of food, and hostilities with the native populations. However, the archaeological record provides physical evidence of what can only be conceptualized by documentation (Walker 2009:42). For example, ship records of colonists arriving in Jamestown can be directly correlated to help identify skeletons, some showing evidence of cannibalism from the "starving time" winter of 1609-1610. Native American beads found in Jamestown, combined with firsthand accounts, implies a mutually beneficial trade network formed (Jamestowne Rediscovery Group 2021).

In order to preserve national heritage and identity, the government works to draw upon experts any time the land is drastically worked or the landscape has naturally shown change over time. As such, archaeology has become essential to historic preservation, land development, and understanding the past through what has been left behind. Before any work can be done by the federal government, archaeologists and surveyors are called in to ensure that proper steps are taken to preserve any historically significant finds in the area (Coleman, et. al. 1985). Down to a localized level, a farmer whose land has been in use since the mid-18th century may desire archaeologists to excavate for evidence of past land occupancy to better understand what existed before the modern-day structures. Signs of exterior buildings, such as slave quarters or outhouses, or even stained soil from a filled-in well or a trash pit, tell a story about the people who came previously.

> "The first duty of the archaeologist is to discover…material and to verify it; the next is to secure its preservation…Then comes the task of studying it, classifying and arranging it, and making it ready for use." (Fish 1978: 8)

Historical archaeology's focus on preservation entails the careful excavation and recording of each artifact's location within the ground. This information, also known as provenience, identifies to future archaeologists exactly where every artifact came from (Gibb 1999) where "order and sequence are necessary…[one] must be able to classify and assign [the] material culture objects to their proper places" (Russell 1978:11). If there were ever a need to return to a site and reevaluate the materials, the provenience would provide enough data to accurately locate where each unit was and the various strata within (Figure II.1). Such information becomes inseparable from the objects and the material culture they represent.

> "Excavation, no matter how skillfully conducted, is sheer wasted effort unless the results are properly recorded and passed on to those who will use the published report to footnote theories of their own." (Hume 1983:194)

Archaeologists remove artifacts from within each unit and each layer respectively. By keeping each individual layer and unit separate, it is easier to decipher information, particularly dating. These artifacts are what is known as material culture, or the products of a culture's activities. Although archaeology will focus on the physical products, there are also oral and written artifacts that create the whole of culture. For an example of this, we can use America's bicentennial to demonstrate material culture.

When celebrating the Declaration of Independence during the country's bicentennial in 1976, many organizations became dedicated to the history of the country. From 1970-1976, the country saw committees create celebratory events, parades, and firework displays. In 1970 with the movie *Patton* and continuing into 1972's *1776*, multiple patriotic movies were released. One souvenir was the commemorative plate (Fig. I.1), celebrating the signing of the declaration.

This physical object represents the veneration of our country's past leaders and the creation of America. Representing the signing of America's Declaration of Independence—a

written record denouncing Britain as the ruler of America and severing ties with the Empire as a colony—the raised decoration makes this entirely useless as an actual plate. Such plates are still available to this day and are a collector's piece desired by patriotic Americans who hope to honor their founding. Should this plate be found on a site in the future, it is inferred that the archaeologists of the future would see this as an honorary souvenir of a past event that held a multitude of importance in our culture.

Figure I.1, Commemorative plates like this one were created to celebrate the United States' bicentennial. This is an example of culture, including material and oral culture.

https://www.replacements.com/collectibles-wedgwood-bicentennial-plate-declaration-signed-no-box/p/8

As important as having access to material culture is, these objects mean nothing without the knowledge and skills required to achieve useful site data. The following sections will address various methods of preserving, dating, and categorizing the finding of an archaeological site.

II. Background Research

This section will define stratigraphy and its purpose within dating and provenience. Then, I will highlight one artifact typology in particular, ceramics, and explain their purpose as material culture, and how they can be used for dating.

As we have seen, archaeology's systematic excavation process allows every artifact to have provenience, or an exact origin, onsite. Excavation units are typically dug in perfect squares, for example, 5 feet by 5 feet, with each soil level carefully excavated and tagged accordingly. These individual soil levels, known as *strata*, are in chronological order, with the deepest layers being the oldest (Figure II.1) (Wallace 2020). The study of a site by traveling through each stratum chronologically is known as *stratigraphy*.

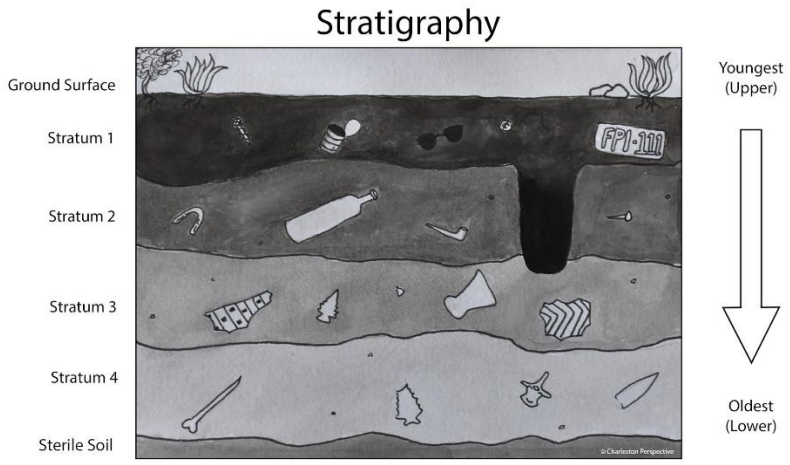

FIGURE II.1. An example of stratification and stratigraphy at work, with each layer representing a different time period chronologically. (https://greenriverpreserve.org/blog/2020/12/stratigraphy-and-provenience-in-archaeology)

Features are found within sites and, similar to stratigraphy, specific features of sites will date to within (but do not range across) the entire time frame for the rest of the site. These discrete, or finite, date ranges may be due to changes in occupancy, natural disaster, or destruction of old buildings. These features are usually obvious upon excavation due to the

difference in soil color, inclusions, materials, and compaction. Post holes, builders trenches on exterior buildings, and evident fill in material hint at features that were only present for a certain amount of time.

In order to fully understand a site, archaeologists examine not just site features but specific artifacts that can be relevant to the dating of the site. Although a whole assemblage is important to understanding the life of occupants on a site, not every artifact is conducive to providing a concise frame of time for occupancy.

> "As ubiquitous products prone to stylistic change in response to new fashions and consumer preference, ceramics are readily datable, and often prove the most diagnostic materials recovered…" (Barker and Majewski 2006:205)

Ceramics are some of the most studied artifacts that provide approximate dates to any given site due to their variety and evolution over time, changing with the general populace's interests and desires. Ceramics are created of clay, also known as *paste* (Matson 1994). This paste will vary upon the type of ceramic being made, ranging from pure clay to having inclusions, such as gravel or sand. The paste body is fired at high temperatures within a kiln, where the temperature will affect porosity and how hard, or vitrified, the end ceramic is (Courtney 1994). Ceramics can also have a slurry or clay-water mixture added onto the exterior during the firing process to create a *slip* on the exterior of the piece (Shepard 1974). Once the piece has been fired initially, a *glaze*, typically made of lead, would be added to waterproof, or finish, the paste and it would be refired. A glaze could also be added before the ceramic has finished its initial firing. Such glazes are essential to seal a vessel that otherwise would have

been porous. The resulting ceramics on North American sites can fall into one of three major categories: earthenware, stoneware, and porcelain (Figure II.2).

FIGURE II.2. Examples of the three main categories of ceramics found during archaeological digs in North America. (https://www.sciencelearn.org.nz/resources/1769-what-are-ceramics)

Earthenware is the most utilitarian, although its lower firing temperature results in a porosity that requires an additional glaze to be waterproof. Earthenware during the North American colonial period has various subcategories, such as creamware and pearlware (determined by the color of the glaze on the paste), and North Devon gravel-tempered ware.

Stoneware is also quite utilitarian, with the firing process occurring at a higher temperature, creating a nonporous, waterproof ceramics. Typically, stoneware is used for drinking mugs, jugs, and crocks. Salt is added during the firing of the glaze, creating a pitted, orange peel-like exterior. Examples of stoneware include English white salt-glazed stoneware and blue and gray Rhenish salt-glazed stoneware.

The third type of ceramic is porcelain, made from kaolin clay and fired at the highest temperature, making it highly vitrified and the most refined. The cross-section of its paste reveals a uniform appearance without inclusions. Porcelain was initially available only to colonial North America through imports from China or Japan. These are known as hard paste porcelain and grew in popularity for being stain resistant. By the 1700s, English potters were mimicking the

style with soft paste porcelain (softer and with a more porous body than hard paste) and bone china (made of bone ash, with a strength between hard and soft paste porcelains). Chelsea porcelain is one of the more popular types of English porcelain.

> "Pottery offers a rich field for comparative studies because of the variety of styles, techniques, and material it presents." (Shepard 1974:351)

Every piece of ceramic has aspects specifically analyzed by archaeologists. Typically, these analyses are made on the idea of a rimmed vessel, although such techniques can also be applied to flatware like plates and platters (etc). First, we look at the pottery sherd to determine a type of paste and glaze. Second, the origin of the sherd must be determined to the best of expert ability. A sherd may be from the *base*, also known as a *foot*, if found on specific dinnerware. The body is the entirety of a piece from base to rim, for plates this includes the space between the shallow well for food through to the interspace between well and rim, known as the *marly*. Finally, there is the *rim*, where a piece is rounded off for safe handling and pouring. Ceramics can have various other decorations, including handles on larger dinnerware like crocks.

Besides a physical description and analysis of the ceramic, archaeologists spend time reviewing the history of a site to best understand the presence of certain ceramics over others. Archaeologists on the Calvert site in Annapolis, Maryland, work with a long occupancy period, from the early 18th to early 20th century (Maryland Historical Trust 1990), and therefore must work with material culture covering an incredibly long time span. Because of this, any time-sensitive artifacts, such as ceramics, must be handled carefully to protect provenience. Because the Calvert family was part of Maryland's elite, governing the colony early on, there is an expectation that artifacts will show evidence of early colonial wealth. Upper class ceramics are

more likely to be brought directly from Europe, rather than bought from the local market, and may show more exotic designs and styles.

The display of wealth within material goods serves as a means of establishing social status. For the Calvert family and many British American colonists, teawares were the ceramics specifically kept for displaying purposes. Dainty porcelain with intricate decorations were brought out specifically during social tea times (Deetz 1996:86).

> "Elegant dining required a different setting: a social space surrounded by ceremony; fine glass and fine china," (Yentsch 1994:133).

When compared to the known domestic sellers and nearby markets, it becomes obvious that the Calvert ceramics, "constitutes a different assemblage than…used in other homes," and that Chinese porcelain and tea wares, "symbolized the family's social and political rank…direct order through British factors (versus) purchases at local stores," (Yentsch 1994:143).

These aspects of material culture, both physical and symbolic, do not apply to ceramics alone. Archaeologists can study artifact assemblages to infer about the nature of colonial markets, both domestic and imported wares. Material goods would evolve with the public's view of themselves and the world. The increase in temporal awareness played a key role in the adopting of a consumer culture, reminiscent of modern capitalism, the idea of "newness," and the movement from a communal society to a more individualized lifestyle.

III. Literature Review

In order to further understand how ceramics apply to our understanding of past cultures, I studied the use of material culture in understanding the economy, where ceramics helped supplement the founding of a consumerist culture. With the shift to a capitalistic society, the value of individuality increased and a colonial perception and acknowledgement of time was introduced. Finally, I looked into how else archaeological sites are dated: what other aspects of a site can be used to identify a time period?

Colonial Capitalism

In studying material culture, many historical archaeologists have discovered a relation between the artifacts discovered and their role in the market at the time. Originally, durability was most desired by early settlers for longevity because of the distance market goods had to make across the ocean. limiting the colonial economy. The solution to this created a reliance on domestic and sustainable materials.

Wood trenchers, spoons, and pewter mugs (Figure III.1) were often preferred over ceramics for their durability (Matthews 2010:72). Such tools were also reminiscent of the colonists' European roots, acting as a way of replicating the English lifestyle many early colonizers experienced. There was little chance of pewter breaking over time simply because it was cast metal. If something were to happen that rendered the piece useless, unlike a ceramic which had to be scrapped, pewter could be remelted and recast into a new object.

Having a reliable material like this was essential when it was time for market goods to arrive from across the Atlantic at the earliest point of colonialism. Alongside durability, the concept of age was especially prized in pewter within the household. Although not decorative, old pewter

was indicative of a long life within a singular family's household. Specifically, the word *patina* draws to mind the natural aging of pewter over time and with usage (Lucas 2006:43).

Despite the benefits of pewter, ceramics held greater possibility for innovation. Unlike metal or wood, ceramics were able to be decorated in various ways through glazes, slips, designs, transfer prints, among others. Also, unlike other materials, ceramics could contain hot liquids like soups, teas, and coffees. Because of this, and the industrialization of ceramics like pearlwares and cream wares, patina and age as a status symbol were replaced by the late 18th century with a desire for new wares and ceramic designs. It is important to note that domestic wares were available from local potters, as early as the late 17th century; however, "most of the products were vastly inferior to imported wares and so did not find markets beyond their area of manufacture," (Hume 1969:99). The greatest challenge for local potters was creating proper glazes to fully seal and waterproof vessels, a skill that was already mastered by English potters and therefore made domestic wares cheap but ineffective.

The eventual stabilization of the import market allowed for ceramics to be introduced to every class and replace pewter within the household. Colonists desired to take part in owning the best ceramics of the day. While the upper class could directly import ceramic sets from England (Leone 1988:246-247), lower and middling classes were more likely to buy from shops after importation occurred.

The style and quantity of ceramics were both a status symbol and an important aspect to social life. The rapid production of these refined wares made replacements easy and provided for a form of "consumer revolution" (Lucas 2006:44). Many English potters were pushing to produce "the designs most popular at the moment" (Hume 1969:110).

Figure III.1, Pewter mugs like these were used for their durability and low cost, https://emuseum.history.org/internal/media/dispatcher/3072/preview

Colonial Temporal Construction

When thinking of a job, one may picture an eight-hour workday with a half hour lunch break, sitting in a cubicle working with sporadic water cooler and bathroom breaks. This idea did not exist until after the Industrial Revolution, when workers came through the factory in shifts to keep things running. Before the implementation of a "workday," Americans lived by the sun. For farmers and trade smiths, work lasted from sunup to sundown, without any scheduled breaks, other than meals. In a society without electricity, colonists would have had to work with natural light and concluded their day when the sun no longer provided enough light to guide the hands.

The result of a day guided by the sun meant that clocks were not necessary to the household. A town would have a clock, typically attached to the church, where bells would ring as a reminder of the passage of time. This was more of a nod rather than an order holding any meaning to colonists, and typically occurred without much acknowledgement by colonists. Along with this life outside of time, in the 17th century colonists behaved communally, most likely due to the medieval lifestyle many still portrayed from earlier time in Europe (Lawrence

and Shepherd 2006:72). This is evidenced by the usage of communal mugs and wooden troughs for meals.

The Enlightenment's introduction by the mid-18th century changed many aspects of everyday life. Meals were more individualized, people buying more dinnerware (according to their class), and communal mugs were swapped for individual ceramic cups. Clocks also became an artifact found in many houses, a "domestication" of time (Lucas 2006:45). This experimentation with new ways of living is also referred to as the "Georgian worldview" (Lawrence and Shepherd 2006:72 and Deetz 1996:61-62).

Why does time play such a key role for archaeologists? "Ultimately, the concept of archaeology is bound up with the concept time: by rethinking time, we rethink archaeology," (Lucas 2006:47). It can be said that time is the most critical factor affecting the view archaeologists have of the past, and the usage of the same calendrical and timekeeping systems makes American colonists easy for us to study because of this. We can also step back from literal time to other understandings of time. The calendar involves a chronological look at artifacts, but we can also use various scientific and written means to determine the age of objects and decipher how human behavior changed with time.

Keeping Track of Time- Archaeological Dating

Due to the evolution of science, one useful method of laboratory work is to date artifacts via radiocarbon dating. By studying the Carbon 14 isotope, scientists can draw an estimate of the age of an artifact to within a very short time span of its actual production. This works only on organic materials, like textile, flora, and fauna, and with a minor degree of error due to the introduction of radiation to the environment in 1950, which affects isotope decay.

Dating also comes in forms such as ice core dating and dendrochronology (Fig III.1). By drilling a sample of ice from a glacier, one can not only determine age but also the conditions the glacier experienced, such as global warming and cooling periods. Each individual level is a different year or age. For an ice core sample, the thicker the level the colder the year, and the thinner the levels suggest a warm year. For tree rings, a ring is added each year of its life. The thicker the ring, the wetter the year and the thinner rings suggest a dry year. The rings can also be counted to find the age at which the tree was chopped down.

Figure 2 Figure III.1, Ice core dating (left) informs scientists of weather patterns over centuries, https://icecores.org/sites/default/files/2018-02/WAIS_ICECORE-HR.jpg; tree rings (right) inform of weather over hundreds of years, from initial growth to when it was chopped down, https://climate.nasa.gov/rails/active_storage/blobs/redirect/eyJfcmFpbHMiOnsibWVzc2FnZSI6IkJBaHBBckFvIiwiZXhwIjpudWxsLCJwdXIiOiJibG9iX2lkIn19--c5bda65fa46930c3d28f1f54a711da860ba6e75f/tree_rings_standard.jpg?disposition=inline

There is also formulaic dating. This involves the collection of artifacts of a specific type to be inserted into a mathematical equation to retrieve data. One example of this is the Lewis Binford pipe stem equation (Binford 1962). By studying the bore diameter of a pipe stem, one can estimate the production age of the pipe. In 1962, Binford determine that there was a linear regression of pipe stem diameter (Figure III.2) where, over time, pipe stems lengthened, and the diameter of the bore shrank.

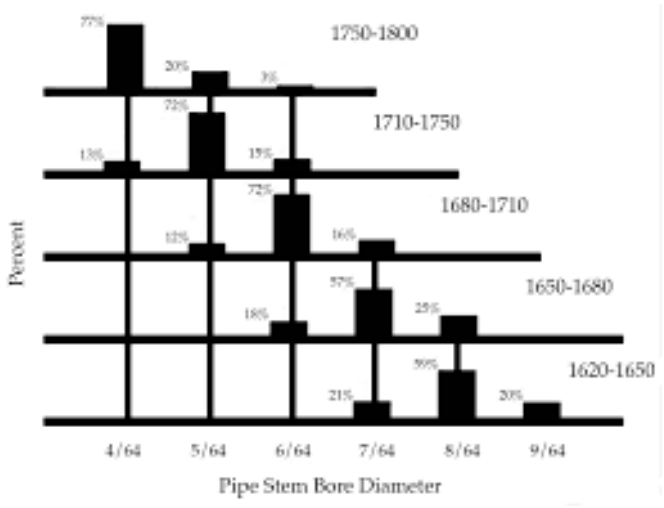

*Figure 3 Figure III.2, the Binford pipestem formula shows linear regression over time, where bore shrinks as time moves forward, *

Over time, as tobacco production increased, its quality changed, and pipe stems were made longer to keep the face farther away from the pipe bowl. In theory, if pipestems were to continue at the regression rate assume by Binford, the pipe would be entirely closed by approximately 1931.85 (Binford 1978:66, McMillan 2016:19). The formula for this would be y= 1931.85-38.26x where y, the mean date of the pipe stem assemblage, is equal to the end date of the linear regression (1931.85) minus the product of the slope of the regression (38.26) times the median pipe stem age in the sample. As with South's mean ceramic formula, there are some limitations to this formula, including the need for an adequate sample size. However, over a whole assemblage, by quantifying pipe stems from across the entire site, the date from Binford's formula is proven to be fairly accurate from 1680-1760, although anything later is harder to date using this formula (Callage, et. al 1999:27).

It is also important to acknowledge the usage of TPQ and TAQ when determining a time frame for a site. *Terminus post quem*, or TPQ is the date at which a site must be dated after. An example of this would be working a colonial fort and finding an English coin stamped 1607.

Clearly, the coin would not have existed before its minted date, and therefore that fort must date from sometime after its TPQ of 1607. TAQ, or *terminus ante quem,* is the date before which a site is dated. Although harder to determine due to the multitude of reasons for any given artifacts' absence, archaeologists can look at ceramic types to assume a likely endpoint. If, for example, a home does not contain any Buckley-type wares, it is possible the site dates to before the production or popularization of Buckley-type ware.

Multiple methods of dating can be combined to achieve accurate dating. Even if two formulas work towards the same goal, they can be used simultaneously to check each other. Moving forward, we see that historical archaeologists will influence and create formulas based on the work of others. Another usage of quantified data being used in a formula involves Ivor Noël Hume's studies on colonial British American ceramics, ultimately leading to the creation of the mean ceramic date formula by Stanley South, as covered in the next section.

IV. Past Research of Ceramics and Dating Methodology

Ivor Noël Hume worked as a historical archaeologist for the majority of his career, on sites from Roanoke to Williamsburg, where he would eventually become the Director of Archaeological Research at Williamsburg. Some of his most influential work was the categorizing and dating of ceramics. Hume culminated his work on artifact categorization in 1970 with *A Guide to Artifacts in Colonial America* (Miller, et. al. 1996). Based on years of extensive archaeological and historical research, Hume included ceramic categorization and their median date ranges. Although not entirely comprehensive, most of the commonly produced and imported ceramics to the British colonies can be dated by Hume's work.

The importance of Hume and his work cannot be understated. Often considered the "father of historical archaeology," his time in the field revolutionized how historians and the public view archaeology; "Noël Hume not only has given us the most complete description and identification of the universe in which we all labor… (he has) stressed the relationship between documents and objects…" (Deetz 1988:221). Before the 1970s, much of archaeology was focused on providing supplementary evidence to the written record rather than an object-oriented focus. Artifacts were not meticulously documented or analyzed unless they met the goal of the dig. Because of this goal-oriented approach, most provenience was lost, and little care was taken to provide a long-term understanding of the importance of the miscellaneous artifacts found on-site.

From the 1970s onward, however, there was a novel approach to archaeological sites, often referred to as "New Archaeology." Although Ivor Noël Hume would inspire Stanley South, an American archaeologist, his work as an archaeologist relied more on the written record rather than studying the artifacts for understanding. Thanks to the work of his successors, including

Stanley South and Lewis Binford, archaeology broke new ground as a serious scientific field that looked at sites overall with a meticulous magnifying glass to make inferences of the past. By using various preservation methods and technology, an archaeologist could look at sites without necessarily relying on others to provide a goal. Archaeology became a front-runner in identifying and contextualizing the artifacts in order to understand past cultures and people.

This leads into processual archaeology: of looking into cultural changes by identifying adaptation and cultural change through artifacts, specifically in this case of ceramics over time (Berger 2009:95). Originally archaeologists would leave material culture at a blanket statement, "the circular argument of employing the concept of culture to explain how cultures change." (Berger 2009:96) Processual archaeology also looks at why some cultures do not change over time, while others evolve rapidly. In essence, this specific form of archaeological research contributes to understanding material culture, its origins, and cultural changes over time.

Ivor Noël Hume's categorization and median dating of colonial ceramics was determined by researching individual potters and their work, as well as excavating kiln sites. This would directly impact Stanley South's research into ceramic dating; by 1977, South determined that by analyzing ceramic assemblages over a site, one can more precisely determine periods of occupation and activity through a mathematical formula. The process by which he came to these dates is known as the mean ceramic date formula.

All colonial ceramics have a start, peak and end date to their production. While the period of production may range in length, some were produced longer than others, the peak production date is accepted as being the midway, or median, point between start and end of production. Another way to think of this is through a bell-curve graph, or unimodal curve, with the apex being the peak in production. How can we assume that ceramics are used in a bell curve fashion?

As a society, from the early 17th century through to the late 18th century, British colonial America was involved in consumer culture (Markell 1994:52). Much like today's trends, colonial potters would create "fads" that were only desired by the public for short periods of time. The spread of ceramics evolved to quickly move goods from the Eastern seaboard inward to the furthest frontiers (South 1978: 70), ensuring that each ceramic type and make were quickly available to all consumers. Such rapid distribution created a temporal marker for when ceramics were introduced, peaked, and eventually fell out of favor within the market, all based upon potters' production in response to the market. By 1977, Stanley South took this information to produce a formula for site dating based on ceramic sherds (Figure IV.1).

Taking the total number of sherds of each ceramic type, and multiplying by the median date, one can add all these products up and divide by the total number of sherds to procure a specific date. This date is considered to be around the midpoint of occupation and, when analyzed at various levels, provides an understanding of site usage.

When looking at a site as a whole, mean ceramic dating can confirm an occupation date-range, such as a midpoint in occupation or a period of desertion. On a smaller scale, such as a feature or singular strata, mean ceramic dating proves useful to pinpoint a smaller, more specific date range, or period of usage, within the larger site. If a trash pit is only used for four years on a site that is occupied over a hundred years, then dating can provide evidence of this.

$$MCD = \frac{\sum_{k=1}^{n} m_k f_k}{\sum_{k=1}^{n} f_k}$$

where m_k median date for type k; f_k frequency of type k; n total number of types

FIGURE IV.1. The Mean Ceramic Date formula, as created by Stanley South in 1977.

(https://www.mattpeeples.net/mcd.html)

Uses and Constraints of South's Formula

There have been many instances where South's dating method has been applied to sites that have already been dated independently of ceramics, proving both the accuracy of the mean ceramic date formula as well as the importance of ceramics to the overall assemblage of artifacts found at a site. South and Hume's work has been used in many site analyses to categorize and date sherds as well as provide an approximate date range for occupation.

South's Testing of his own Formula

In order to test his method, South tested the formula on several sites. At the first Fort Moore (38AK4-15), the date range of the site is 1716 and was decommissioned in 1747 with the building of the second Fort Moore. With a mean ceramic date of 1726, which falls nicely into the time frame and is relatively close to the actual median date of the site of 1732 and even closer to the pipestem date of 1731 (South 1978:76,78).

The second Fort Moore (28AK5-A) was built in the same area as the first fort, and therefore dates from 1716 to 1766. The mean ceramic date of this site is 1742, almost equivalent to the historical median date of 1741, and earlier than the pipestem date of 1744 (South 1978:78). It is important to note that quantifying ceramics would be less accurate than the mean ceramic date formula due to the presence of creamware only in the earlier fort, which affects the inference that a white site is older (South 1978:76). Creamware and pearlware were industrialized ceramics from the mid-1700s (Hume 1970:124,128), and would be expected at the second fort, not the first.

Due to South's work at proving his method, mean ceramic dating is now commonly used in archaeological research of British North American colonial sites. Although this formula has

proved to be useful, there are instances where a site cannot be dating using mean ceramic dating, as we will see at St. Mary's City.

St. Mary's City: Why Some Sites Cannot Use South's Formula

One example of this dating method not being used occurs during the excavations of St. Mary's City, Maryland, from 1981-1984. St. Mary's, being the state's first capital until the very end of the 17th century when it was moved to Annapolis, has a Town center with definite start and end dates to the location as a whole, about 1634 to 1694. Because of the rural tobacco industry, the town was never very populated with long term residents, but was home to several inns, state buildings, and at least one fort. Five sites were documented and excavated during this time frame. Of these, four were positively identified with set occupational periods, whereas one was still not fully identified in its structural purpose (Miller 1986: 11). Only one was still partially unidentified in structural purpose. Despite such confined dates, there is no evidence from these reports of South's formula being tested, instead there is a focus of ceramic type quantification and distribution.

The Country's House, dating back to 1635, Smith's Townland site, dating to 1666, and Cordea's Hope, dated 1675, were used as inns around the same period, the later 17th century (Miller 1986:36, 95, 112). Three buildings of the same usage around the same period should show similarities in ceramic assemblage (Miller 1986:17, 89). And at all three sites, utility wares, including coarse earthenware like North Devon gravel-tempered, appeared near the kitchens on the properties.

This inference of coarse earthenware and its association with outbuildings associated with foodways comes from the knowledge that large, thick ceramics were most often used in

food preparation and storage. Tableware ceramics, including the subcategory tea ware, were meant to be thinner, lighter, and more appeasing to the eye. Specifically, what is seen at St. Mary's is the greater likelihood that at this time, that inns were using durable wares of other materials, such as pewter and wood, for dining. Due to the early occupation of St. Mary's, the mean ceramic date is not the best option for dating. Archaeologists' focus on distribution and quantified data to determine site usage over time and is preferred at sites where ceramics are plentiful but too early for accuracy in dating. The mean ceramic date formula can only be used with accuracy in a short window of time in British colonial North America (from the 1700s to 1800s).

Another major constraint of the mean ceramic dating formula is the inability to use every ceramic sherd found on-site. Some ceramics have extended production dates and are not conducive to an accurate dating. Imported Chinese porcelain has a median ceramic date of 1730; however, it was produced from 1660 to 1800 (South 1978: 71). These ceramics are typically left out of mean ceramic dating because they do not meet the short temporal distribution and production rates desired.

Mean ceramic dating requires a large sample. Typically, archaeologists pull as many ceramic sherds as possible from a unit to procure a date. If that unit were to contain only five sherds, the mean ceramic date would vary wildly from the rest of the site. A solution to this, especially found within features, is to pull all ceramics from an entire stratum to date as one. This way, the sample number is high enough to achieve an accurate mean ceramic date across the entire feature. This method also determines the rate at which a feature was filled, whether over time or quite rapidly, within a few short years.

V. Original Research

In working with Washington College's Past is Present Archaeology Lab, I have become familiar with the site of Andelot Farm (Figure. VI.1). The client who owns the land desired to know about past occupancy that occurred on the property. Andelot is also known as 18KE25 (the site identification comes from three separate aspects: the order of the contiguous states in alphabetical order, the county abbreviation within the aforementioned state, and the registration number of the site. Mayland is the 18th contiguous state alphabetically; Andelot Farm is found in Kent County and is the 25th site registered in Kent County, originally added to the register in the 1970s). Initial surveys of the site were for prehistoric archaeological purposes and unrelated to the current historical archaeology work at the site.

From Dr. Julie Markin's initial draft report of the 2015 excavation (finished 2016) at Andelot, we know the initial site surveys were done by Steve Wilke and Gail Robinson (known in later reports as Thompson) on the pretense of investigating as a prehistoric site (Wilke and Robinson, 1974). Amongst initials surveys, evidence was found suggesting occupation in "Late Archaic, Middle-Late Woodland, and possible 18th century components" (Markin, 2016).

After the initial 2015 excavation, the initial site was lost, and a new start was made at Andelot led by Elizabeth and John Seidel. Features identified as trash pits were found, and the logical inference of a house being nearby led to expanding excavations westward and northward in search of possible structures. This is where current excavations are ongoing, including forty units and over twenty-four features having been found (Figure V.II). My data comes from two features, specifically Features 1 and 4, two of the initial trash pits found in the eastern-most part of the site (Figure V.I).

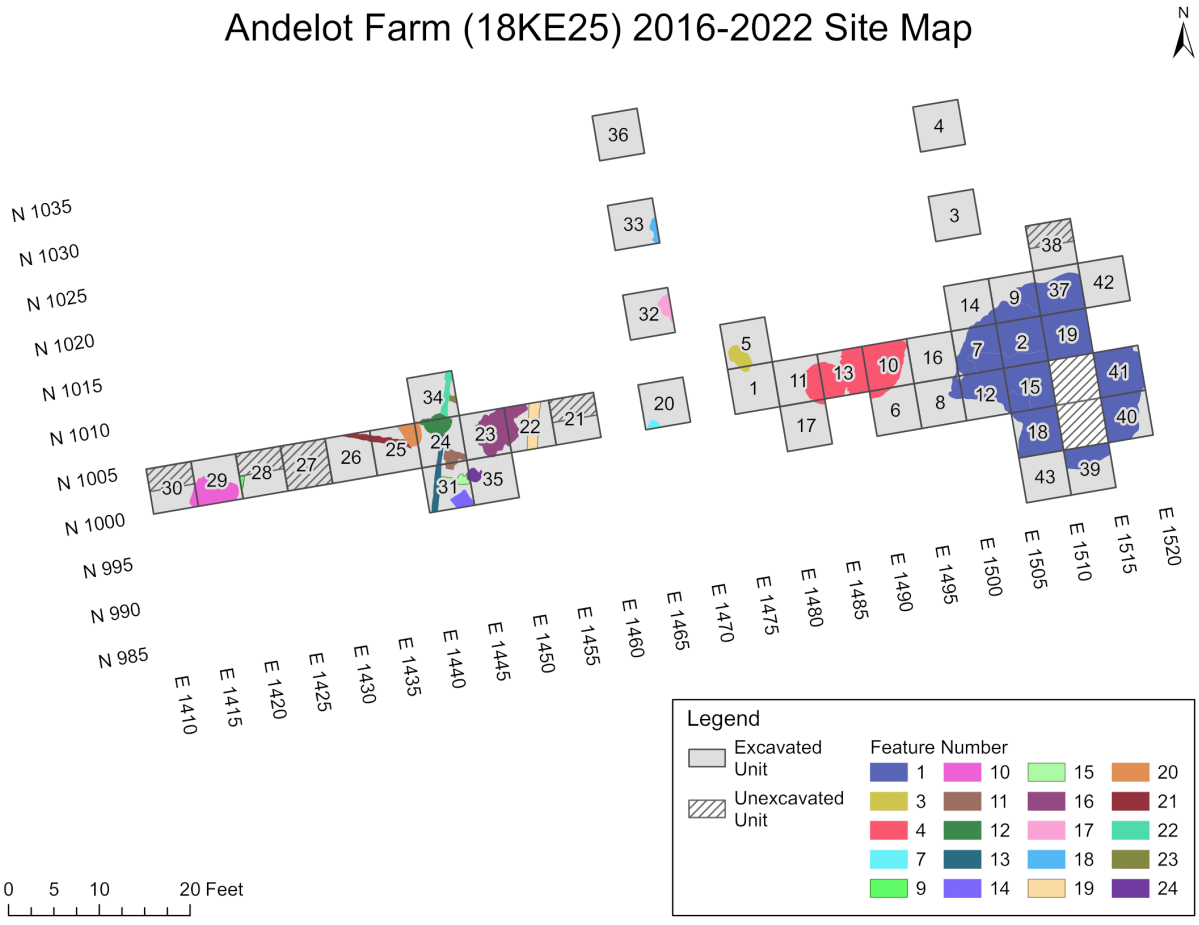

Figure V.I, Andelot Farm's features over 40 units and 24 features within the excavations from 2016-2022, photo courtesy of the Washington College Past is Present Archaeology Lab

FIGURE V.1. Andelot Farm in the process of being excavated, 2016-2022

Photo courtesy of the Washington College Past is Present Archaeology Lab

Andelot is found in Worton, Maryland, and the historical component, when the site was occupied, dates from around 1680 to 1720. Although we can use land deeds and documentation to give a broad timeline to the site, we can also further specify our timeline through artifact analysis because, "ceramic fragments are among the 'archaeological historians' principal means of dating the ground in which they are found" (Hume 1972: 217).

Features 1 and 4 at Andelot are defined by soil stains revealing a nutrient rich deposit in the area, proving the area to have been used as a refuse pit or deposit. Typically, a refuse pit was used until it was too full and would be buried, capping the date of this component of the site to be a few years, in comparison to the whole of Andelot's forty-odd years of occupation.

While the site is still being investigated and excavated, there is evidence from the whole of the artifact assemblage which points to the occupancy range of late 17th to early 18th century. By studying specific features, and dating the ceramics at each stratum, I can provide evidence that confirms the date range and gives a midpoint for occupancy and usage of each feature.

To confirm my data set, I reviewed all ceramics from Features 1 and 4 at Andelot (Figure VI.II). I pulled every sherd of ceramic from both features in a given stratum and ensured they were catalogued correctly according to the lab typology, with extra sets of eyes being Elizabeth Seidel, director of the Past is Present Archaeology Lab, and Charles Fithian, Staff Archaeologist.

Because the earth has been worked by farming, the first foot or so of soil is disturbed and shifted horizontally. This stratum is known as the *plowzone* and spans about a foot downwards. Archaeologists once feared all data of a plowed field for the first foot was too damaged and disturbed to be relied upon for accurate artifact retrieval and analysis. However, research since then has proven that "while vertical stratigraphy is indeed destroyed by plowing, the horizontal or spatial distribution of materials is affected only minimally" (King 2004:1).

Figure V.III, Some ceramic sherds found include German blue/gray salt-glazed stoneware like these two pieces from Feature 1

The following steps were taken for each feature's various levels: after ascertaining the quantity of each type of ceramic, I multiplied this amount by the median ceramic date for that specific type, as listed in Hume's *A Guide to Colonial Artifacts*. The product of each ceramic

type times its median ceramic date is added together and finally divided by the total sherd quantity. The resulting number is the mean ceramic date for that stratum of the entire feature.

I studied each level in chronological order, from most recent to oldest strata, following the pattern of excavation. Starting with the plowzone, I pulled artifacts from Feature 1 and 4. The ceramic date would represent the peak occupancy of the site in which the trash pit was filled, and the chronology of layers would show whether this dumping was over an extended period or within a few years.

Research Data and Analysis

Feature One has been determined to be a trash pit due to the artifacts like floral and faunal refuse (shells, bones, etc.) and broken materials. Starting at just plowzone level, there was an adequate number of sherds that I feel comfortable using its mean ceramic date of approximately 1712. Because plowzones shift artifacts minimally across the horizontal plane, this date will give a value close to, but not 100% accurate to the levels below. In this case, Feature One's first level, A, was dated to 1715, which is still relatively close to the plowzone date (Table 1).

Type	Sherd Quantity	Median Production Date
North Devon Gravel-Tempered	262	1713
German Blue/Gray Stoneware	18	1668
North Devon Sgraffito	60	1680
English (White) Salt-glazed Stoneware	5	1753
English (Brown) Salt-glazed Stoneware	27	1733
English Salt-glazed Stoneware	20	1763
Staffordshire Slipware	10	1733
English Salt-glazed Stoneware Dipped	9	1745
Buckley	10	1746
MEAN CERAMIC DATE		1712.45

Table 1, Mean Ceramic Date of Feature 1's Plowzone

Moving further down into Feature One, there were several strata levels C through E, and G through I, there were not enough ceramics to use the mean ceramic date formula (Table 2). Level F had roughly 15 sherds and provided a date of 1710, which I feel is accurate enough to assume the levels above date between 1710 and 1715. Because accurate dating ends around level F, there will need to be other methods used to date the lower levels of the feature. The time

frame of about five years at least, and the depth of the pit suggest this was a popular dumping ground and is most likely a major place of refuse for the farm and its occupants.

Level	Mean Ceramic Date
Plowzone	1712.45
A	1715.2
B	1708.91
C	1713
D	1713
E	1713
F	1710.58
G	1746.33*
H	1711.4
I	1713

Table 2, Mean Ceramic Dates of all Levels in Feature 1, some dates (*) are inaccurate due to small sample size

Feature Four is also a trash pit, although smaller in size compared to Feature One. Feature Four's plowzone dates to 1710, suggesting it was used around the same time as Feature One (Table 3). There were relatively few levels relating to the feature to date, and their sherd quantities were limited, especially in level A. Level B did include enough ceramics that I feel the date of 1708 is accurate, with level A dating to sometime from 1708-1710 at least (Table 4). The shallowness and short time frame suggest the pit was quickly filled and a new one was started, possibly Feature One.

Type	Sherd Quantity	Median Production Date
North Devon Gravel-Tempered	91	1713
German Blue/Gray Salt-glazed Stoneware	11	1668
North Devon Sgraffito	12	1680
English (White) Salt-Glazed Stoneware	2	1753
English (Brown) Salt-Glazed Stoneware	2	1733
English Salt-Glazed Stoneware	5	1763
Staffordshire Slipware	4	1733
English Salt-glazed Stoneware Dipped	4	1745
MEAN CERAMIC DATE		1710.61

Table 3, Mean Ceramic Date of Feature 4's Plowzone

Level	Mean Ceramic Date
Plowzone	1710.61
A	1723
B	1708.14

Table 4, Mean Ceramic Date of all Levels in Feature 4, some data may not be accurate due to small sample size

In order to determine whether or not my dates were accurate, I studied GIS and Cultural Research Specialist Madison (Madi) Kaye's pipe stem dating. Using Lewis Binford's linear regression formula, she quantified and dated the pipe stems across several features and the site as a whole, as well as dating Features 1 and 4, both plowzone and the aggregated strata dates (Table 5, Kaye 2021).

Provenience	Sample Size (n) of Measurable Pipe Stems	Pipe Stem Date
Aggregate (2015, 2016, & 2017)	631	1723.4
Aggregate (2016 & 2017)	534	1723.9
Plow Zone Over Feature 1	221	1726.9
In Feature 1	36	1715.0
Plow Zone Over Feature 4	108	1720.4
In Feature 4	68	1722.0

Table 5, Madison Kaye applied Lewis Binford's formula for pipe stems to perform aggregated dating of the site and features 1 and 4

The plowzone over Feature 1 dated to 1726.9 and contained 221 dateable stems in the sample. This later date could be due to the large sample size and is most likely more accurate than the date within Feature 1, which was 1715 with just 36 pipe stems in the sample. Although this date is closer to level A's mean ceramic date, the pipestem quantity is greater than that of ceramics.

Feature 4's plowzone dates to 1720.4 with a sample size of 108. Within feature 4 the aggregated date is 1722 and 68 pipestems. From this, we can determine the proximity of dates suggested. When looking at both features, it is suggested that Feature 1 was created after Feature

4. Madison also acknowledged how bore stem decreased in diameter over time, dropping off quickly and suggesting Andelot was quickly abandoned.

With supplemental dating from Madison's report, we know that the quantity of sherds may not be plentiful enough to reliably date within features accurately, although some trends are similar. Ceramic dating does prove Feature 4 is earlier than Feature 1, and that Feature 4 was most likely filled very quickly while Feature 1 was filled over a longer time.

The variety of ceramics found onsite suggests that those who lived at Andelot were part of popular culture, changing their ceramics to match the greater society's interests. Because there is evidence of several types of stone and earthenware, it can be inferred that inhabitants desired several utilitarian forms to meet various needs as they became available over time. For instance, English salt-glaze dipped stoneware would have been a development that came later and challenged the popularity of earlier English and German salt-glazed stoneware.

Conclusions and Further Research

For the purposes of dating Andelot, I feel the mean ceramic formula has some prospective use for dating plowzones across the site. Both the aggregate date of plowzones over Feature 1 and Feature 4 included enough ceramics, 395 and 131 respectively, to reliably date the surface level. We can infer from the plowzone success that other features on the site can also use South's formula to provide reliable evidence to an approximate date. We can also infer some basic knowledge of when those features may have been closed, along with Kaye's data; feature 1 would have closed mid-1710s to early 1720s, while feature 4 proves to be from an earlier period.

The greatest downside is the need for an ample ceramic assemblage. Past the plowzone, the levels within each feature held drastically fewer sherds and made dating inaccurate. In order to study features, other ceramic analysis, such as distribution and type quantification, as well as other dating methods such as the Binford pipe stem formula may prove more useful. I feel that due to the great disparity between plowzone and Level A of Feature 1's ceramic quantity, there is the need for at least 100 sherds to accurately apply the mean ceramic date formula.

The future archaeological work at Andelot can selectively apply the mean ceramic date formula to certain aspects of the site, but it will take other methods of dating to decipher the entirety of the site and cross-referencing between several dating methods to accurately define when Andelot was used.

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