

**“ONE MORE BOWL AND THEN?”:  
A MATERIAL CULTURE ANALYSIS OF PUNCH BOWLS**

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**ABSTRACT**

Beyond the beauty of the bowls and the whimsy of the sayings, colonial punch drinking assumed an important role in the realm of gentility, sociability, and group membership. Early theories largely viewed imbibing and its material accoutrements as part of the transition from communal to individual-centered lifeways and the structural shift from folk to courtly dining traditions. More recently, scholars interested in the history and archaeology of alcohol and the active role of artifacts have approached punch drinking from alternative, post-modern theoretical angles. This paper argues that our current methods for analyzing and comparing the cultural importance of punch from its material remains inadequately address the specifics of punch consumption and, therefore, is incompatible with new theoretical developments. A new model is offered for the material culture analysis of punch bowls. Based on bowl capacity and informed by archaeometric data, this method provides a foundation upon which more meaningful interpretations of drinking might be based.

**INTRODUCTION**

“Since drinking has power, to give us relief, come fill the bowl, and a pox on all grief, if that won’t do, we’ll have such another, and so we’ll proceed, from one bowl to the other.” This short poem appears around the interior rim of a tin-glazed earthenware punch bowl dated 1740, probably manufactured at a pottery in London (Grigsby 2000:344, Figure D312). The pithy, humorous, and somewhat irreverent nature of this saying, and others like it, have made delftware punch bowls a favorite among museum curators, archaeologists, material culture specialists, social historians, and even modern bar-goers. In fact, as recent headlines prove, punch drinking is experiencing a revival in modern popular culture, and punch can be found on the menus of the trendiest bars in cities like Washington, DC and New York (Stern 2008; Wilson 2010).

Beyond the beauty of the bowls and the whimsy of the sayings, colonial punch drinking assumed an important role in the realm of gentility, sociability, and group membership. Punch drinking reinforced feelings of hospitality among the drinkers, which were cemented by rousing toasts to the host and hostess, the king, party guests, prosperity, and health. Recipes for punch, served hot or cold, varied, but often included five ingredients: spirits (rum, brandy, or arrack), citrus (lime, orange, or lemon), spices, sugar, and water. Punch could be ladled into cups or glasses or, perhaps more crudely, drunk straight from the bowl and passed around the table (Lange 2001). Though usually associated with men, punch was also consumed by women both domestically and in public places, such as taverns and punch houses (Harvey 2008). The practice of punch drinking in the home increasingly bordered on the ceremonial, not to the extent of tea, but in similar ways. Punch drinking could be a social event requiring a set of tools to accomplish its most refined form, including cups, strainers, and ladles, along with the knowledge of a set of accompanying behaviors, including toasting, “with its implied connotations of restraint, fortitude, courtesy, and obligation” (Goodwin 1999:131).

Early theoretical interpretations of punch drinking equated the practice with the transition from communal to individual-centered lifeways, which accompanied the structural shift from medieval folk to

Georgian courtly dining traditions (Yentsch 1991a; Deetz 1996). More recently, scholars interested in the history and archaeology of alcohol and the transformative role of material culture have approached punch drinking from alternative theoretical angles. For example, Lorinda Goodwin (1999) has interpreted punch drinking as a reflection of the pursuit of novelty goods, which were readily available during the consumer revolution. One's ability to obtain items considered new and unique and use them along with a well-refined set of mannerly behaviors set the individual apart from the "crowd of dedicated consumers" (Goodwin 1999:119). In his study of late seventeenth- through early eighteenth-century Barbados, Frederick Smith (2001, 2008) concluded that punch drinking and other forms of alcohol consumption reflected the need for sociability and the opportunity to ease anxiety in a socially fluid world on the Caribbean's unstable frontier. In contrast, cultural historian Karen Harvey (2008) has viewed punch drinking through the lens of gender and refinement. Specifically, she juxtaposed tea and the teapot, women, and refinement with punch and the punch bowl, men, and barbarity. She argued that these dichotomies broke down at the end of the eighteenth century as strict lines between genders blurred and the punch fraternity underwent a brief period of domestication, which was evidenced in the decline of the punch bowl and the ascendance of the more polite punch pot.

### HOUSEHOLD CONTEXT

While these theoretical perspectives are interesting and useful, they must be based on solid, systematically-collected documentary and archaeological databases of ceramic vessel forms and functions. Drawing on data from George Washington's Mount Vernon plantation as a starting point, this paper explores and critiques the existing comparative data on punch drinking. This article also offers a new analytical technique, which allows archaeologists to more quickly and thoroughly identify punch bowls and interpret the punch ceremony from archaeological remains.

Mount Vernon's South Grove Midden provides the opportunity to pursue what can be learned about the Washingtons' social world in the years before the Revolutionary War through the lens of punch drinking. The goal of the larger South Grove Midden project is to re-catalogue, analyze, and present in an online format the most significant aspects of this collection as it pertains to the lives of the Washington households and the enslaved individuals who lived and worked around the "great house." Research is guided by a material culture approach that engages with the documentary record at both the plantation and regional levels using a comparative archaeological perspective. Part of this project includes in-depth research on more than 380 ceramic vessels excavated from the South Grove Midden site, including a small collection of four punch bowls. In addition to archaeological evidence, documentary data in the form of probate inventories and orders and invoices between George Washington and his British factors offer clues about what a material culture analysis of this nature might contribute that enhances the archaeological record of the midden. Specifically, this evidence shows that the punch ceremony served increasingly elaborate and specialized purposes in the decades before the Revolutionary War.

George Washington's elder-half-brother, Lawrence, inherited Mount Vernon from their father, Augustine, in the early 1740s. As Lawrence, his wife, and daughter began to ascend the ranks of colonial Virginia society, the patriarch died in 1752 and his estate, which included 37 slaves, was inventoried the following year (Breen 2003). The inventory included at least three punch bowls: one of Chinese export porcelain and two that were likely made of delftware. Additionally, Lawrence Washington possessed a punch ladle, which was almost certainly made of silver. Also in his inventory, executors recorded one of the primary ingredients of a punch party: more than 80 gallons of rum (Washington 1753).

Increased participation in the punch ceremony is evident in the early years of George Washington's tenure at Mount Vernon (Table 1). This is evidenced by an abundance of documentary data detailing his participation in the consignment system, particularly between 1750 and 1775. Through these data, we witness the consignment of tobacco grown at Mount Vernon to English factors who, in turn, extended the credit Washington needed to furnish both his house and plantation.

In 1758, Washington received an invoice for a shipment of a dozen white salt-glazed stoneware punch bowls ranging in size from three pints to two quarts. In 1766, he received an invoice for two punch

bowls – one with a capacity of one gallon, and the other of two quarts capacity, made of porcelain with a Nanking border. Just four years later, another invoice spoke to the growing importance of punch in the household. George Washington was charged for seventeen bowls of “Queen’s China” (a.k.a. creamware) in sizes ranging from a pint and a half to two gallons (Abbot 1988; Abbot and Twohig 1990, 1993).

These invoices suggest that the practice of the punch ceremony changed significantly in the Washington households over the span of approximately 20 years. They also suggest that the ceramics market increasingly responded to and/or encouraged this demand for punch-related vessels. As Washington ordered more and more bowls from British factors, their capacities exhibited an increasingly larger range, suggesting that the punch ceremony was becoming more elaborate and specialized. As period images show, the size of punch bowls mattered (Figures 1, 2). Paintings and prints depict intimate settings that necessitated smaller bowls, while larger, more raucous and convivial groups demanded vessels that could hold several gallons of drink. This change was occurring just as mass-produced, fashionable ceramics like white salt-glazed stoneware and creamware began to meet this need.



Figure 1. “The Catch Singers,” publications attributed to Robert Sayer, second half of the eighteenth century. © The Trustees of the British Museum.

### DOCUMENTARY EVIDENCE

Probate inventories offer a documentary database that scholars have often used to contextualize and compare plantation-specific records. Inventories from York County, Virginia offer the only transcribed, digitally accessible, and county-wide list of probates in Virginia, capturing the period from 1645 through 1800 (Colonial Williamsburg Foundation 2010; Purkis 2010). The York County data suggest that, on average, only 6 in 100 individuals owned vessel forms of this type for all periods. These records also show the height of punch bowl ownership occurred between 1741 and 1760, with the earliest punch bowl recorded in 1682 and the latest bowl recorded in 1798 (Figure 3). Since the database stops in 1800, it is



Figure 2. "Glee Singers Executing a Catch," drawn by Robert Dighton, second half of the eighteenth century. © The Trustees of the British Museum.

possible that punch bowls were owned by York County residents into the nineteenth century. However, this late eighteenth/early nineteenth-century end date for the practice of the punch ceremony is corroborated by a survey of estate owners in Virginia and Maryland compiled by the Gunston Hall Probate Inventory Database Project. While this database contains inventories through 1810, no punch bowls appear after 1789 (Center for History and New Media 2006).

In addition to punch bowls, probate inventories allow archaeologists to better understand the world of punch drinking accoutrements as well. Punch implements, like the silver ladle owned by Lawrence Washington, almost never make their way into the archaeological record. Probate inventories suggest that in York County, households served punch without the aid or flourish of associated implements (such as strainers, ladles, and punch cups or glasses) until almost 50 years after the first recorded punch bowl. In fact, the ownership of punch accoutrements peaked later than bowls did, in the period 1761 through 1780 (Figure 4).

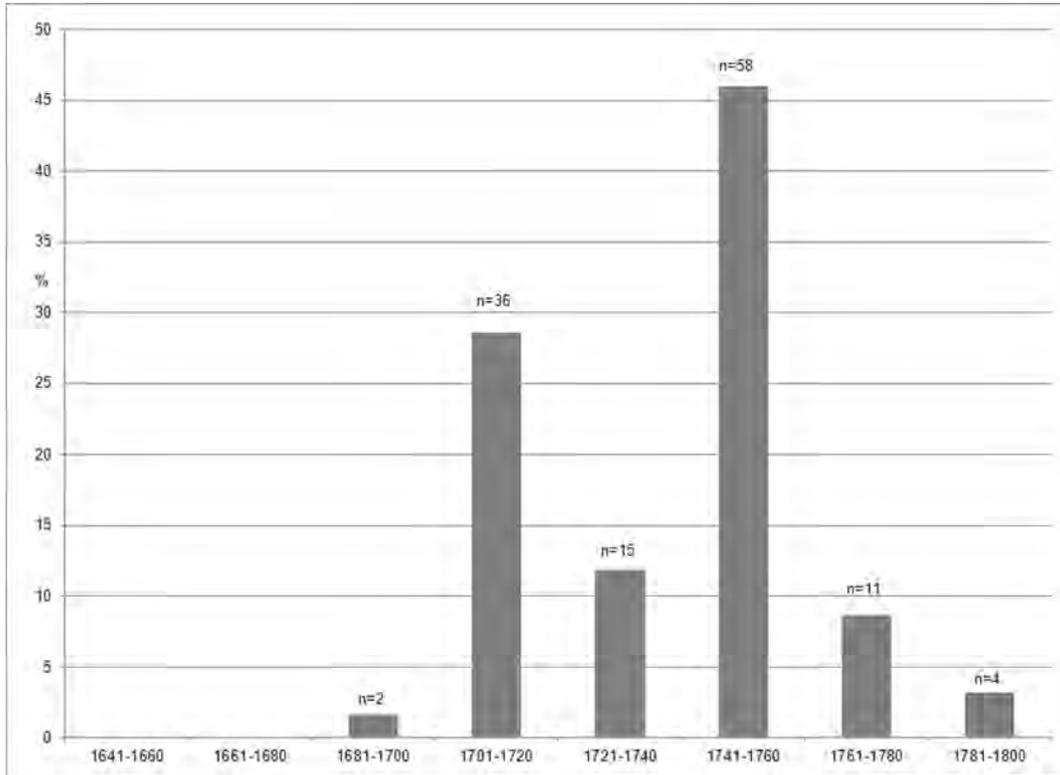


Figure 3. Punch bowl ownership in York County, Virginia, 1645-1800.

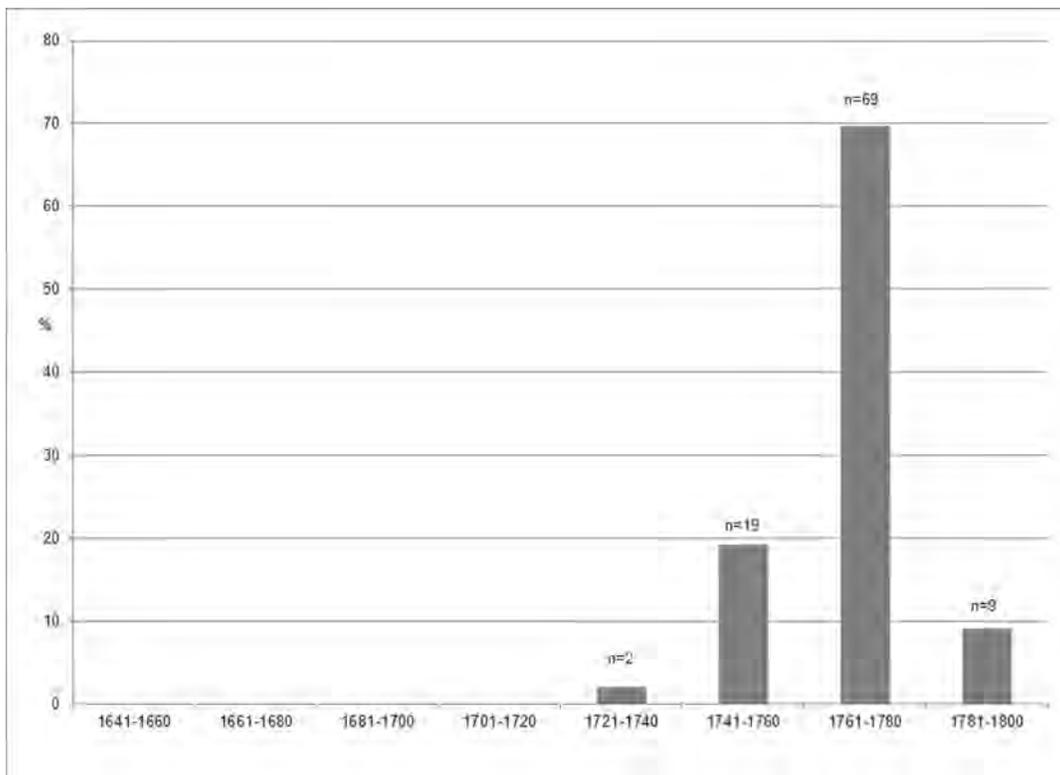


Figure 4. Punch implement ownership in York County, Virginia, 1645-1800.

While probate inventories are useful, to say that probates offer a complete picture of punch consumption in the home during the colonial and post-colonial periods, however, neglects to recognize the inherent biases in these types of data (see Pogue 1993, 1997; Veech 1998). For example, did executors consistently recognize and record punch bowls in a way that makes their enumeration accurate? Do we risk ignoring punch bowl ownership among socio-economic groups for whom probates were not consistently taken? For these and other reasons, archaeologists and other material culture specialists have increasingly begun to examine documents like store ledgers, since these records more accurately capture the diachronic and dynamic nature of consumerism for a larger segment of the shopping population, as opposed to the snapshot of a whole lifetime's worth of purchases found in probate records (Martin 1993, 2008; Heath 1997, 2004; Veech 1998; Crane *et al.* 1999; Reber 2003).

In her study of ceramics sold in eighteenth-century Annapolis, Anne Yentsch (1994:331-332) found in store ledgers that all five merchants stocked their shelves with both large and small punch bowls made of delft, lignum vitae (wood), and other materials along with accoutrements like punch ladles. Paul Reber (2003) found that customers of John Glassford's store in Colchester, Virginia, recorded in ledgers between 1759 and 1766, bought three and a half times the number of punch bowls as teapots, and that punch bowls were priced more cheaply than the ubiquitous pewter dishes. Further work with the Colchester store inventories also found that the merchant Alexander Henderson offered punch bowls of three capacities (one-pint, three-pint, and one-quart) in white salt-glazed stoneware, tin-glazed earthenware, and porcelain (Hamrick and Hamrick 1999).

Just south from Colchester in northeastern Virginia, an independent merchant named Daniel Payne operated a store in Dumfries during the late 1750s and early 1760s (Hamrick and Hamrick 2007). His store accounts, dating from 1758 to 1764, record that 27 individuals purchased punch bowls during this period. Of the 27 transactions, 24 clearly recorded the number of bowls purchased by individual customers. More than 50 percent (n=13) of these customers bought a single bowl; 30 percent (n=7) bought 2 bowls; and for the remainder, one customer each bought 4, 5, 6, and 9 bowls respectively. While the level of specificity of sizes purchased by individuals is lacking, we can say that Payne offered four sizes of bowls: one-pint, one-quart, two-quart, and one-gallon. Therefore, store documents suggest that merchants made available a range of punch products and capacities for purchase by individuals of differing social and economic levels.

The main difference, it appears, between bowls purchased by customers at local stores and consumers who purchased bowls using the consignment system is one of quantity. The majority of mid-eighteenth century consumers only needed one or two punch bowls to sufficiently enact the punch ceremony. At this time, accoutrements were largely unnecessary, though that would soon change. Other more wealthy consumers, like George Washington, needed multiple punch bowls of differing capacities to be ready for any social situation that might arise. This demand only increased with the introduction of creamware, as represented by Washington's specific request for punch bowls of nine sizes: half-pint, three-pint, five-pint, one-quart, two-quart, three-quart, one-gallon, one-and-a-half gallon, and two-gallon (Table 1).

### ARCHAEOLOGICAL EVIDENCE

In addition to probate inventories and store accounts, the archaeological record offers another source of information on punch bowl ownership as it pertains to different socio-economic groups. The archaeological record also provides another way to view change over time in the popularity of the ceremony. Through the Digital Archaeological Archive of Comparative Slavery (DAACS) there is the potential to understand punch vessel ownership in the archaeological record of enslaved households in a readily accessible, standardized, and searchable online database.

While DAACS is focused on sherd level analysis, vessel data can be teased out by applying estimated vessel equivalencies (EVEs). This analytical technique relies on the length and diameter of rim or base sherds to approximate counts or categories of vessel forms (Banning 2000). Unfortunately, at present, querying the database for punch bowls reveals negative results, because this form was not

TABLE 1: GEORGE WASHINGTON'S PURCHASES OF PUNCH BOWLS, PRE-1775

Shipment Date	Invoice Description	Cost (£/s/d)	Order Date	Matching Order Description
08/18/58	3 punch Bowls [possibly white stoneware]	12/30/99	01/01/58	1/2 dozn fashionable China Bowls from a large to a Midlg Size*
08/18/58	2 two Quart bowl [possibly white stoneware]	0.17.0	01/01/58	1/2 dozn fashionable China Bowls from a large to a Midlg Size
08/18/58	1 two Quart bowl colourd [possibly white stoneware]	0.7.6	01/01/58	1/2 dozn fashionable China Bowls from a large to a Midlg Size
08/18/58	4 three pint bowl enameld [possibly white stoneware]	12/30/99	01/01/58	1/2 dozn fashionable China Bowls from a large to a Midlg Size
08/18/58	2 large quart bowl [possibly white stoneware]	0.9.0	01/01/58	1/2 dozn fashionable China Bowls from a large to a Midlg Size
11/17/66	1 Galln Punch Bowl	0.14.0	06/23/66	1 large China bowl to hold a Gal.
11/17/66	1 two Qt punch bowl Nankn bordr	0.6.6	06/23/66	1 large China bowl to hold a Gal. and a half
11/13/70	1 la: Bowl	0.5.0	08/20/70	Of Queen's China— 1 two Galln Bowl**
11/13/70	1 Smaller bowl	0.3.6	08/20/70	Of Queen's China— 1 Gallon [Bowl]
11/13/70	2 Smaller bowls	0.2.6	08/20/70	Of Queen's China— 1 one and a half Galln bowl
11/13/70	2 Smaller bowls	0.2.6	08/20/70	Of Queen's China— 2 three Quart [bowl]
11/13/70	4 Bowls	0.5.0	08/20/70	Of Queen's China— 2 five Pint [bowl] and 2 two Qt [bowl]
11/13/70	2 Bowls	0.2.0	08/20/70	Of Queen's China— 2 three pint [bowl]
11/13/70	3 Bowls	0.2.0	08/20/70	Of Queen's China— 3 Quart [bowls]
11/13/70	3 Bowls	0.1.6	08/20/70	Of Queen's China— 3 pint and a half [bowls]

\*Washington orders 6 bowls, but receives 12.

\*\*Washington orders 17 bowls, but receives 18.

specifically captured during cataloguing. However, because cataloguers did capture data on ware type, general form (i.e., bowl, unidentified tableware) and rim diameter, it might be possible to cull vessel counts from the data if a standard rim diameter range for punch bowls was known (DAACS 2010).

Perhaps we can move toward our goal of a more detailed, comparative view of punch drinking if we first return to the roots of Chesapeake historical archaeology by engaging with the Potomac Typological System (POTS) (Beaudry *et al.* 1988). Like DAACS, the primary goal of POTS is to offer archaeologists a standardized system by which comparisons of artifact types can be made. Mary Beaudry and her colleagues developed POTS in an attempt to transcend inconsistencies in nomenclature by defining and ordering ceramic vessel forms and functions for use in minimum vessel counts. For example, POTS defines punch bowls as:

A hemispherical vessel with a plain rim. Punch bowls occur in refined earthenwares, stonewares, and porcelain. They range in capacity from ½ pt to several gallons. The smallest sizes were used by individuals for drinking punch and perhaps eating semi-solid foods. The larger sizes were used for making and serving punch (Beaudry *et al.* 1988:63).

Compare this to the general definition for a bowl whose attributes include a coarse earthenware body, an absence of footring, a plain or everted rim, and a diary or kitchen function. Though the POTS typology was derived from seventeenth- and early eighteenth-century probate inventories, the basic form of punch bowls changed little over time. Yentsch (1991a:65) made subsequent modifications to the POTS definition of punch bowls by acknowledging the significance of size. In doing so, she broke punch bowl

forms down using two categories—small and large; the former being associated with consumption and the latter with serving. However, in both the initial version POTS and Yentsch's later modifications, specific measurements of vessel forms are absent—measurements that can aid archaeologists with both the identification and interpretation of punch bowls found in the archaeological record.

By building on the comparative analysis undertaken by Yentsch (1990) and others who have used minimum vessel counts to study changing foodways (Smith 2001), we can begin to develop a comparative archaeological picture of punch drinking in early America. Yentsch compiled a list of 18 archaeological sites with minimum vessel counts from the seventeenth through the early eighteenth century. These sites include plantations and urban sites occupied by colonists of varying degrees of wealth in the Chesapeake as well as two sites located in New England. The results of her analysis show that the emergence of punch bowls signaled a shift in from folk to courtly dining traditions beginning in the last quarter of the seventeenth century.

In his dissertation on alcohol in colonial Barbados, Smith (2001) built on Yentsch's data by adding two urban sites—the Backside Church Street site in Barbados and Jamestown Structure 115. Smith argued that Barbadians coped with social anxiety through communal consumption of alcohol in general and punch in particular. Due to this different cultural context, he claimed that punch drinking became more popular earlier in Barbados than in the Chesapeake, as evidenced in higher rates of use and discard of this vessel type. I have added an additional 20 sites to this comparative database, which extends through the early nineteenth century and includes slave occupied sites (Table 2). The result is a comparative database of 38 distinct occupations dating ca. 1600 to 1850. Minimum punch bowl vessel counts have been modified to reflect the POTS definition when necessary. The database is dominated by sites from the Chesapeake in Virginia and Maryland, with only three sites from New England and one from Barbados. These assemblages include 11 urban sites; 6 slave quarters; and 21 farmsteads or plantation sites. The site occupations range in date from 1618 through 1840 and were grouped by half century periods for ease of analysis. Results of phasing the data in this way shows that the highest frequency of punch bowl use and discard occurred from 1700 to 1750. Additionally, the archaeological data suggest that punch drinking continued slightly longer than the probate inventory data show, which was approximately the last decade of the eighteenth century (Figure 5).

At a site specific level, punch bowls make up the largest percentage of total vessels from the middle occupation of van Sweringen in St. Mary's City, Maryland (ca. 1700-1750, 25.9%); the late and early periods of the Shields Tavern in Williamsburg, Virginia (ca. 1700-1750, 19.2%; ca. 1700-1750, 15.3%, respectively); the Backside Church Street in Barbados (ca. 1650-1700, 12.7%); and the Boardman Occupation of the Spencer-Pierce-Little Farm site in New England (ca. 1800-1850, 10.7%). With the exception of the Boardman site, urban occupants or tavern goers tended to have engaged in the punch ceremony and discarded the bowls more often than their rural counterparts. This does raise the question, however, about the nature of urban contexts wherein refuse is difficult to attribute to one household and more often represents the activities of multiple households living on smaller lots. The Barbados site has a higher punch bowl count when compared to other sites in the last half of the seventeenth century. Determining whether this is attributable to its urban context or to larger socio-cultural needs alleviated by punch consumption needs further research.

Finally, it is notable that most of the eighteenth century sites (including those associated with slave quarters) used and discarded punch bowls. Archaeology suggests that the presence of punch, or at least its material embodiment, was experienced more widely than perhaps probate executors recognized. Compilations of lists like these are important tentative steps towards comparative analysis of punch drinking in the Chesapeake and in the greater Atlantic World.

## MUSEUM DATA

Whole object information of the type contained in museum storage spaces and the publication of museum collections provides opportunities for more concrete definitions of vessel types. This kind of research follows the work of scholars like Patricia Samford (1997) and Ellen Shlasko (1989), and the

TABLE 2: PUNCH BOWL PRESENCE AT ARCHAEOLOGICAL SITES COMPILED FROM MINIMUM VESSEL COUNT LISTS

Site Number	Name	Period	Location	Type	Minimum Vessel Counts	Citation
	Pasbehay Tenement	1600-1650	VA	Rural Plantation Mixed	0/18 or 0%	Yentsch 1990
	Kingsmill Tenement	1600-1650	VA	Rural Plantation Mixed	0/78 or 0%	Yentsch 1990
	The Maine	1600-1650	VA	Rural Plantation Mixed	0/88 or 0%	Yentsch 1990
44WM33	Clifts II	1650-1700	VA	Rural Plantation Mixed	0/32 or 0%	Yentsch 1990
	Pettus	1650-1700	VA	Rural Plantation Mixed	0/335 or 0%	Yentsch 1990
44WM33	Clifts I	1650-1700	VA	Rural Plantation Mixed	0/34 or 0%	Yentsch 1990
18CV279	Compton	1650-1700	MD	Rural Plantation Mixed	0/53 or 0%	Yentsch 1991a
	Backside Church Street	1650-1700	Barbados, Caribbean	Urban Domestic	15/118 or 12.7%	Smith 2001
	Jamestown Structure 115	1650-1700	VA	Urban Domestic	4/57 or 7%	Smith 2001
	Drummond Site	1650-1700	VA	Rural Plantation Mixed	7/269 or 2.6%	Yentsch 1990
	van Sweringen 1	1700-1750	MD	Urban Domestic	1/81 or 1.2%	Yentsch 1990
	van Sweringen 3	1700-1750	MD	Urban Domestic	1/84 or 1.2%	Yentsch 1990
	van Sweringen 2	1700-1750	MD	Urban Domestic	15/58 or 25.9%	Yentsch 1990
	Shields Tavern, Early	1700-1750	VA	Urban Commercial	18/118 or 15.3%	Brown <i>et al.</i> 1990
	Wellfleet	1700-1750	MA	Rural Farmstead and Tavern	2/236 or 0.85%	Yentsch 1990
18AP28	Calvert I	1700-1750	MD	Rural Plantation Mixed	20/198 or 10.1%	Yentsch 1994
	Howland	1700-1750	MA	Rural Farmstead	3/136 or 2.2%	Yentsch 1990
44WM33	Clifts III	1700-1750	VA	Rural Plantation Mixed	4/70 or 5.7%	Yentsch 1990
	Shields Tavern, Late	1700-1750	VA	Urban Commercial	54/282 or 19.2%	Brown <i>et al.</i> 1990
44WM33	Clifts IV	1700-1750	VA	Rural Plantation mixed	7/185 or 3.8%	Yentsch 1990
44WB30	John Brush	1700-1750	VA	Urban Domestic	9/211 or 4.3%	Samford 1999
	John Hicks	1700-1750	MD	Rural Plantation mixed	9/263 or 3.4%	Yentsch 1990
44JC34	Bray Well and/or Trash Pit	1750-1800	VA	Rural Plantation Mixed	0/119 or 0%	Kelso 1984
	North Quarter, Kingsmill	1750-1800	VA	Rural Plantation Quarter	0/137 or 0%	Kelso 1984

Site Number	Name	Period	Location	Type	Minimum Vessel Counts	Citation
44HE493	Wilton Plantation, Phase I	1750-1800	VA	Rural Plantation Quarter	0/36 or 0%	Higgins <i>et al.</i> 2000
	Littletown Quarter, Kingsmill	1750-1800	VA	Rural Plantation Quarter	0/76 or 0%	Kelso 1984
44WB52	Rich Neck Slave Quarter	1750-1800	VA	Rural Plantation Quarter	1/128 or 0.8%	Franklin 2004
44GL357	Thomas Whiting Site, Feature 53	1750-1800	VA	Rural Plantation Mixed	1/215 or 0.5%	Stuck <i>et al.</i> 1996b
44PW855	Frances Ballendine	1750-1800	VA	Urban Domestic	1/40 or 2.5%	Crane <i>et al.</i> 1999
44JC	Governor's Land	1750-1800	VA	Rural Plantation Mixed	10/377 or 2.7%	Yentsch 1991b
	Shields Tavern, Post-Tavern	1750-1800	VA	Urban Commercial	12/185 or 6.5%	Brown <i>et al.</i> 1990
44WB30	Thomas Everard	1750-1800	VA	Urban Domestic	14/324 or 4.3%	Samford 1999
44PG381	Hopewell/Bland Site, Feature 104	1750-1800	VA	Rural Plantation Mixed	3/196 or 1.5%	Stuck <i>et al.</i> 1996a
44FX762/17	Mount Vernon, South Grove Midden	1750-1800	VA	Rural Plantation Mixed	4/381 or 1%	
	Kingsmill Quarter	1750-1800	VA	Rural Plantation Quarter	5/186 or 2.7%	Kelso 1984
44FX1965	Thomas Brown Site	1750-1800	VA	Rural Plantation Mixed	6/228 or 2.6%	Higgins <i>et al.</i> 1998
44HE493	Wilton Plantation, Phase II and III	1800-1850	VA	Rural Plantation Quarter	1/182 or 0.5%	Higgins <i>et al.</i> 2000
	Boardman Occupation, Spencer-Peirce, Little Farm	1800-1850	MA	Rural Farmstead	29/272 or 10.7%	Beaudry 2010

tradition of meshing archaeological and museum collections found in publications like *Ceramics in America*. These whole objects also allow us an increasing level of sophistication in understanding how free and enslaved men and women consumed punch in the home and in the tavern. This is due to the fact that measurement data that allow us to calculate capacity are not recorded in probates. This type of information is also not available through archaeological minimum vessel counts. To obtain this level of detail, published print and online collections from seven institutions were mined for measurement data related to tin-glazed punch bowls. From these sources, 215 unique vessels were found with complete height, rim, and footring diameter measurements, or just height and rim diameter measurements.

## DERIVING THE FORMULAS

### Calculating Capacity from Whole Bowls

Wendy Miervaldis (Breen 2011) discovered the closest geometric shape to a punch bowl is a frustum (or clipped cone) whose volume is calculated as:

$$\text{Volume (inches}^3\text{)} = (\pi * \text{height} / 12) * [\text{base diameter}^2 + (\text{base diameter} * \text{rim diameter}) + \text{rim diameter}^2]$$

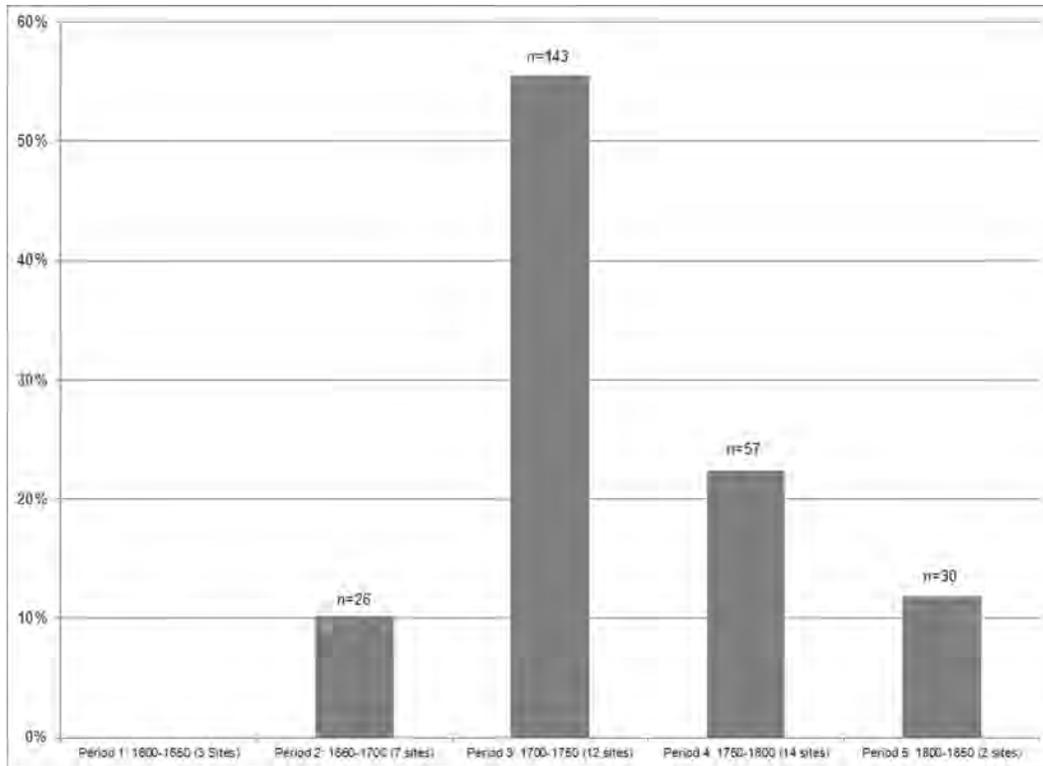


Figure 5. Minimum number of punch bowls from phased archaeological sites in the Chesapeake, New England, and the Caribbean, 1600-1850.

To utilize this formula, half an inch, which was used to estimate the average footing height, was subtracted from the heights of all of the museum punch bowl examples, since a frustum does not have a footing. The resulting volume was then translated into a historically relevant system of liquid measure (i.e., the imperial pint)—a calculation which required multiplying the volume of a frustum (in cubic inches) by 0.03.

Tests of the frustum formula on complete punch bowls suggest that capacity is slightly over-estimated. This could be attributed to the following reasons. *First*, the frustum is not the exact shape of a punch bowl; it is a close estimation of it. *Second*, it is unknown how potters calculated the sizes of the vessels they sold and how exact they were when producing them. Research suggests that eighteenth-century acts for standardizing liquid measures probably did not apply to wheel-thrown, non-tavern, fine wares and that there was variability in bowl capacities (Green 1999; Breen 2012). *Third*, there is also the question of how high these bowls were filled. It was presumably not to the top to allow for easier movement of the bowl without spilling its contents, which would allow for differing capacity measures taken for the same bowl. Calculations of volume and capacity, therefore, should be considered as relative estimates and not as exact numbers.

### Estimating Capacity from Rim and Base Sherds

In order to estimate the volume of a punch bowl, rim diameters, footing diameters, and the height are required. Because of the fragmentary nature of the archaeological record, the known measurements will most likely be found in either the rim or footing diameters. The range of rim diameters for the tin-glazed earthenware punch bowl museum data set is 6.81 to 20.55 inches. The vessels date from 1680 through 1780, with bowls most frequently falling into the 1741 to 1760 period, overlapping with both archaeological and probate inventory frequency data.

Interestingly, there is a consistent ratio of rim to footring diameter of 2.3 to 1. For example, if a rim diameter is 10 inches, the footring can be estimated as 4.35 inches (i.e., 10/2.3 inches). The confidence interval around 2.30 is 0.03. Therefore, if an archaeologist has a tin-glazed rim sherd of 10 inches, the footring can be expected to measure between 4.29 and 4.4 inches 95 percent of the time. This ratio also allows archaeologists to estimate rim diameter by multiplying a footring sherd by 2.3. In addition, with either a known or estimated rim or footring diameter, approximate height can be obtained using regression formulas developed by Miervaldis (2012). Once these three variables are calculated, they can be entered into the frustum volume formula.

A) Estimating the height if you have the footring diameter measurement:

$$\text{height} = 1.0747 * \text{footring diameter (inches)} - 0.5999$$

Based on museum sample footring diameter values ranging from 2.875 inches to 7.625 inches, the estimate of height computed by this regression line could vary by  $\pm 1.744$  inches. (Regression equation is highly significant,  $p < 0.0001$ . The coefficient is significant at the  $\alpha = 0.05$  level ( $p < 0.0001$ ). However, the intercept is not.  $R^2 = 0.53$ .)

B) Estimating the height if you have the rim diameter measurement:

$$\text{height} = 0.518492 * \text{rim diameter (inches)} - 1.27252$$

Based on museum sample rim diameter values ranging from 6.81101 inches to 21.73224 inches, the estimate of height computed by this regression line could vary by  $\pm 1.5688$  inches. (Regression equation is highly significant,  $p < 0.0001$ . Both the intercept and coefficient are significant at the  $\alpha = 0.05$  level ( $p < 0.0001$ ).  $R^2 = 0.67$ .)

C) Estimating the height if you have both the rim and footring measurements:

$$\text{height} = 0.7054 * \text{rim diameter (inches)} - 0.348 * \text{footring diameter (inches)} - 1.5431$$

Based on the data from this study, the estimate of height using both the rim and footring measurements can be expected to vary by  $\pm 1.8097$  inches. (Regression equation is highly significant,  $p > 0.0001$ .  $R^2 = 0.72$ .)

### APPLYING THE FORMULAS

As mentioned previously, the punch bowl is not catalogued in DAACS as a standard type of vessel form. But, because basic bowl form is recorded, as is the general category “unidentified tableware,” we can still apply these formulas to tease out punch bowl capacity to sherds recorded in the DAACS catalogue. Out of the 21 sites catalogued in DAACS, I have been able to identify 6 Dutch or English delftware punch bowls from 6 different archaeological sites of enslavement located in the Chesapeake. These bowls were identified because they have rim sherds with diameters that measured between 6.81 and 21.73 inches and were catalogued as either bowls or unidentified tableware (Table 3). Using the ratio of 2.3, the footring diameter can also be estimated based on the known rim diameter, and height can then be estimated using the regression formula. Finally, by applying the frustum formula to estimate the volume of the punch bowl, we see that these six bowls range in capacity from about one-and-a-half pints to three-and-a-half quarts (DAACS 2010).

In addition to these vessels from DAACS, the capacities of the four punch bowls excavated from the South Grove Midden are included in this study (Table 3). The first two listed are made of creamware and match two of the capacities ordered by George Washington (see Table 1). The next two are made of delftware, measuring one-quart and one-gallon.

TABLE 3: ESTIMATING PUNCH BOWL CAPACITY IN THE ARCHAEOLOGICAL RECORD

Site	Rim Diameter (in)	Catalogued Form	Punch Bowl EVE	Estimated Footring Diameter (in) $\pm 0.03$	Estimated Height (in) $\pm 1.57$	Estimated Volume (in <sup>3</sup> )	Estimated Capacity
Rich Neck	7.09	Bowl	1	3.08	2.42	51.62	1.55 pints or about 1 1/2 pints
Palace Lands	9.45	Unid. Holloware: Tableware	1	4.11	3.64	138.27	4.15 pints or about 2 quarts
Utopia	11.02	Bowl	1	4.79	4.46	230.16	6.9 pints or about 3 1/2 quarts
House for Families	7.48	Unid Holloware: Tableware	1	3.25	2.62	62.28	1.87 pints or about 1 quart
Fairfield	8.66	Unid Holloware	1	3.77	3.23	103.03	3.09 pints or about 1 1/2 quarts
Chapline	7.48	Unid: Tableware	1	3.25	2.62	62.28	1.87 pints or about 1 quart
South Grove Midden	6.5	Punch bowl	1	2.83	2.11	37.88	1.14 pints or about a pint
South Grove Midden	12.67	Punch bowl	1	5.51	5.35	365.01	10.95 pints or about 1 1/2 gallons
South Grove Midden	9.06	Punch bowl	1	3.54	3.95	130.94	3.93 pints or 1 quart or half gallon
South Grove Midden	11.78	Punch bowl	1	5.12	4.93	290.61	8.72 pints or about 1 gallon

Capacity, once elusive to archaeologists, but so important to George Washington and many of his contemporaries is now attainable from a single rim or base punch bowl sherd. The ability to assign rim sherds to the punch bowl form, and estimate punch bowl capacity based on whole object data, offers a compelling research avenue that archaeologists were previously unable to pursue.

### CONCLUSIONS AND FUTURE DIRECTIONS

The confluence of documentary, archaeological, and museum collection-based data now allows for interpretations of the archaeological record previously not available when studying the social world of the Washingtons in the decades surrounding the Revolution. The next step is to apply this capacity estimation formula to other archaeological sites where minimum vessel counts have been performed. Punch bowl popularity curves developed from archaeological and probate inventory data suggest that the practice peaked just before the Revolution. Data detailed in probate inventories evidence a bell-shaped popularity curve in the ownership of bowls and, later, punch accoutrements showing a classic waxing and waning of fashion.

From these data, we see that the punch ceremony became a more elaborate event accompanied by a retinue of objects that bolstered its performance from event to ritual status. Washington's orders and

invoices show that the nature of punch drinking also changed as it became more specialized. No longer was a single bowl sufficient to meet the social needs of those gentlemen in hot pursuit of gentility and domestic refinement. Washington and his peers needed a bowl that perfectly matched each social situation—from small meeting to large gathering. Therefore, for at least some of those who took part, the punch ceremony seems to have changed in the decades leading up to the Revolutionary War. However, store account and archaeological data suggest that for the majority of the colonial population, a single bowl filled with a sweet rum concoction sufficed.

What made the 40-year period before the American Revolution unique is that access to consumer goods appears to have opened larger segments of the colonial population to a more sophisticated and far-reaching system of distribution for imported goods. What we are only just beginning to explore, however, is just how equal this access to the consumer world was. The application of archaeometric tools of analysis on ceramic vessels will allow for the further study of the differences between elite and non-elite consumer habits and ultimately allow archaeologists to explore in more detail their motivations for participating in the consumer revolution, and how consumer goods facilitated and affected social performance for different segments of Chesapeake society.

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