

# Out of Many, One People

The Historical Archaeology  
of Colonial Jamaica

Edited by

James A. Delle, Mark W. Hauser, and Douglas V. Armstrong

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PART I: THE  
2. Feudalism o

3. Port R  
Archaeo

4. Evidence f

PART II: T  
5. Reflections

# Contents

List of Illustrations vii

Preface

*Ainsley Henriques* ix

1. Introduction: Historical Archaeology in Jamaica

*Mark W. Hauser, James A. Delle, and Douglas V. Armstrong* 1

## PART I: THE ARCHAEOLOGY OF THE EARLY COLONIAL PERIOD

2. Feudalism or Agrarian Capitalism? The Archaeology of the Early Sixteenth-

Century Spanish Sugar Industry

*Robyn P. Woodward* 23

3. Port Royal and Jamaica: Wrought-Iron Hand Tools Recovered as

Archaeological Evidence and the Material Culture Mentioned in

Probate Inventories ca. 1692

*Marianne Franklin* 41

4. Evidence for Port Royal's British Colonial Merchant Class as Reflected in  
the New Street Tavern Site Assemblage

*Maureen J. Brown* 56

## PART II: THE ARCHAEOLOGY OF THE PLANTATION SYSTEM

5. Reflections on Seville: Rediscovering the African Jamaican Settlements at

Seville Plantation, St. Ann's Bay

*Douglas V. Armstrong* 77

6. Maritime Connections in a Plantation Economy: Archaeological Investigations  
of a Colonial Sloop in St. Ann's Bay, Jamaica  
*Gregory D. Cook and Amy Rubenstein-Gottschamer* 102
7. The Habitus of Jamaican Plantation Landscapes  
*James A. Delle* 122
8. Excavating the Roots of Resistance: The Significance of Maroons  
in Jamaican Archaeology  
*Candice Goucher and Kofi Agorsah* 144

PART III: THE ARCHAEOLOGY OF JAMAICAN SOCIETY

9. Of Earth and Clay: Locating Colonial Economies and Local Ceramics  
*Mark W. Hauser* 163
10. Household Market Activities among Early Nineteenth-Century Jamaican  
Slaves: An Archaeological Case Study from Two Slave Settlements  
*Matthew Reeves* 183
11. Assessing the Impacts of Time, Agricultural Cycles, and Demography on  
the Consumer Activities of Enslaved Men and Women in Eighteenth-Century  
Jamaica and Virginia  
*Jillian E. Galle* 211
12. Identity and Opportunity in Post-Slavery Jamaica  
*Kenneth G. Kelly, Mark W. Hauser, and Douglas V. Armstrong* 243
- Epilogue: Explorations in Jamaican Historical Archaeology  
*Douglas V. Armstrong* 258
- References 273
- Contributors 315
- Index 319

1.1. I  
2.2. Pos  
3.1.  
3.2. Plan view  
view  
3.3. Wrough  
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## Assessing the Impacts of Time, Agricultural Cycles, and Demography on the Consumer Activities of Enslaved Men and Women in Eighteenth- Century Jamaica and Virginia

*Jillian E. Galle*

### Introduction

The past two decades have witnessed a growing consensus among social and economic historians that the “consumer revolution” was among the most significant developments in the history of the early modern Atlantic world (Breen 1986; Brewer and Porter 1993; C. Campbell 1987; Carson, Hoffman, and Albert 1994; McKendrick, Brewer, and Plumb 1982; Styles and Vickery 2006). The availability and importance of material culture at all scales, from houses to ceramic wares, accelerated throughout the seventeenth, eighteenth, and early nineteenth centuries. During this same period, the Atlantic region was transformed by the influx of people, many of whom were enslaved Africans, who spoke unfamiliar languages and employed different customs. As voluntary and forced migrants came together in new living and working situations, traditional and culturally specific ways of identifying status were no longer easily identified or universally understood. In this new world, the acquisition and use of consumer goods played an essential role in the strategies invented by people to communicate shifting status and social identities (C. Carson 1994, 2003).

By the 1750s, economic changes in the English-speaking Atlantic world made some degree of nonessential consumption viable for almost everyone, including enslaved people. Almost all sought to acquire the new consumables, but each entered the market constrained by their abilities and motivations. Some people purchased only the occasional ribbon or refined ceramic ware while others updated tea sets and clothing styles with regularity (Ashelford 1996; Carr and Walsh 1994;

C. Carson 1994; Martin 1993, 1994; McDonald 1993; Mintz and Hall [1970] 1991; Simmonds 1987; Styles and Vickery 2006; Walsh 1992). Free people of color and enslaved women and men also participated in the market economy, often acquiring more than just a single nonessential item.

From the Caribbean to the Chesapeake region of North America, enslaved workers shopped in stores and markets and traded and bartered with each other, free blacks, and their owners for items that were not part of weekly or yearly rations. Eighteenth-century travelers' accounts and merchants' records demonstrate that the enslaved purchased items such as sugar, alcohol, tools, ceramic wares, cloth, buttons, and buckles (Baumgarten 1988; Beckles 1989; Fox-Genovese 1988; Heath 2004; Martin 1993; McDonald 1993; Penningroth 2003; Schlotterbeck 1991; Simmonds 1987; Walsh 1992). Archaeological evidence from eighteenth-century slave quarter sites in both regions confirms that enslaved people found ways to earn money and that they spent a portion of what they earned acquiring fashionable consumer goods (Armstrong 1990; Galle 2006, 2010; Hauser 2001; Heath 1999b, 2004; Higman 1998; Reeves 1997).

However, few historical or archaeological studies have sought to systematically measure consumption patterns among the enslaved or to understand the factors underlying their consumer activities. One reason may be that enslaved participation in Jamaican and Virginia markets has been studied in isolation, as local or island-specific phenomena. Here I suggest that enslaved individuals who participated in local economies for fashionable imported goods were simultaneously reacting to and shaping the mechanisms that were driving the consumer revolution across the Atlantic. Although played out on the local stage, slave participation in the market economy was an active response to the growing need for efficient and effective communication in rapidly changing environments. In this chapter I use archaeological evidence to argue that the ability of, and incentive for, enslaved individuals to engage in the market economy, especially for the acquisition of non-essential costly goods, represents a series of strategic responses to the larger demographic and economic changes sweeping across the Atlantic world.

Jamaica and Virginia offer important archaeological and historical case studies in the workings of the larger Atlantic economy. In addition to rich visual and textual accounts, both regions have extensive archaeological resources that are especially useful in light of the limitations of written records related to slave participation in local and regional markets. This study brings together archaeological data from thirty-eight sites located on nine plantations in Jamaica and Virginia. As the largest comparative archaeological study of slavery to date, this research reveals regional consumption trends while highlighting individual household consumption strategies. As we'll see, enslaved Jamaicans and Virginians who participated in the market economy consciously chose objects that created and expressed identity. However, their individual choices were also embedded in and influenced by cultural and economic changes affecting both regions in the eighteenth century.

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Signaling theory helps elucidate the contextual factors that structured consumer choice and provides a model for understanding artifact patterns as the result of dynamic regional behavioral strategies.

After briefly reviewing the historical literature on enslaved participation in the local economies of Jamaica and Virginia, I use signaling theory to offer expectations about the use and discard of three categories of expensive, imported European artifacts: metal buttons, refined ceramics, and glass tablewares. A fourth category of imported material culture, glass beads, adds complexity to the data set. Glass beads represent a less costly adornment item that may have been purchased at markets and stores or that may have been brought to the New World on the bodies of enslaved Africans during the Middle Passage. Specific historical variables such as plantation type and demography of each region are used to model the discard of these four artifact classes. Statistical methods such as negative binomial regression and principal component analysis are used to argue that gender-based consumption strategies were active in both regions throughout the eighteenth and early nineteenth centuries.

### Market Participation in Jamaica and Virginia

Historians of Jamaica and the Caribbean have focused on the central role that enslaved individuals played in building and sustaining island economies during the eighteenth and nineteenth centuries (Beckles 1989, 1995; Bush 1990; Hall 1987; Higman 1995; Mintz and Hall [1970] 1991; McDonald 1993; Simmonds 1987). While it is easy to assume that all enslaved Africans had similar purchasing power in the Sunday markets, archaeological evidence analyzed here suggests that many enslaved Jamaicans only earned enough money to purchase household essentials that they were unable to make or grow. This is likely the result of Jamaica's provisioning system, which advocated the allocation of provision grounds to the enslaved instead of the regular distribution of food rations (Beckles 1989; Higman 1998; McDonald 1993; Reeves 1997). This system put tremendous stress on enslaved individuals and families. Their survival depended on their ability to cultivate gardens after a debilitating day in the cane fields or the sugar factory and put household production at the mercy of unpredictable and often violent island weather. Despite these conditions, many enslaved Jamaicans produced excess ground provisions that could be traded or sold in exchange for perishable goods that they could not produce themselves. Those who were more successful at growing crops in excess of their family's needs began to acquire nonessential household items.

Enslaved Jamaicans also raised livestock, made lace bark, and crafted brooms, furniture, and ceramics for Sunday markets across the island (M. Lewis 1929; Long [1774] 1970; P. Wright 2002). By the early 1700s, Sunday markets were a routine part of life for many enslaved Jamaicans. Contemporary travelers and planters in Jamaica vividly described enslaved people selling fruits and vegetables to higglers

or directly at markets. Despite attempts to control and curtail market activities during the last quarter of the eighteenth century, enslaved participation in Jamaica's Sunday markets was legal and critical to the economic success of white merchants and free blacks (McDonald 1993; Mintz and Hall [1970] 1991; Reeves, this volume; Simmonds 1987). Enslaved Africans, as producers, marketers, higglers, and customers, drove local economies and were an essential component of both rural and urban markets (Hauser 2001; McDonald 1993; Reeves 1997; Simmonds 1987).

In Virginia, enslaved participation in the market economy was not only less visible, it was illegal. Laws passed throughout the eighteenth century prohibited whites from trading with, purchasing from, or selling goods to enslaved Africans and African Americans (Berlin 1998:35; Schlotterbeck 1991:171; Walsh 1992). However, as the eighteenth century progressed, slaves in the Chesapeake, especially males, had increasing opportunities to earn cash, which they used in stores and markets throughout the region. Like their counterparts in Jamaica, enslaved people in Virginia grew vegetables and raised poultry that they sold to their owners and in local markets (Berlin and Morgan 1995; Heath 1999b, 2004; Hudson 1994; Martin 1993; Penningroth 2003; Schlotterbeck 1991; Walsh 1995a, 1995b). Many enslaved women and men sold non-foodstuffs such as baskets and brooms while others earned money from tips or additional work (Berlin 1998:34; Heath 2004:23; P. Morgan 1998:361; Nicholls 1990).

Consumables that dulled some of the harshest edges of slavery such as rum, sugar, and molasses were among the most popular items purchased by enslaved Virginians. However, enslaved people also acquired items that have left traces in the archaeological record. Men frequently purchased tools and raw materials to create salable items (Heath 2004:29). Although slaves in central Virginia acquired the tools necessary to process fiber and make cloth, account books from John Hook's store in Franklin County, Virginia, also indicate that good quality textiles made up the largest percentage of enslaved purchases (Martin 1993:309). Men and women purchased fashionable items like buttons, buckles, ribbons, and hats to adorn provisioned clothing or newly purchased fabric (Genovese 1976:557; Heath 1999b, 2004; Martin 1993:309; Schlotterbeck 1991:177). These fashionable choices are confirmed by early twentieth-century former-slave narratives that point to the importance of distinctive, non-provisioned clothing for communication and self-expression (Baumgarten 1988, 1991; Fox-Genovese 1988; Perdue et al. 1976:316; Rawick 1972; White and White 1998).

### Signaling Theory

Why did enslaved Africans and African Americans spend valuable time and energy pursuing fashionable European goods? Why did they endure the risks inherent in acquiring and displaying non-provisioned items? How did enslaved people use costly imported material culture to communicate their identity and position

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to other slaves, free blacks, and whites with whom they interacted on plantations and in cosmopolitan spaces? One useful way to understand the patterns and processes underlying slave consumption is through a theoretical framework known as signaling theory.

Signaling theory is grounded in the idea that material and physical displays function as forms of communication among individuals and social groups (Bliege Bird and Smith 2005; McGuire and Hildebrandt 2005). Displays that involve economic or physical risks can provide a variety of essential and often difficult to observe information about a person, ranging from economic and social standing to more intangible qualities such as psychological character, physical skill and stamina, and possession of esoteric and cultural knowledge. Signaling theory contends that the successful communication of these personal attributes is vital to establishing and maintaining relationships, especially in large groups.

Honest and costly signaling facilitates personal and group relationships by convincing receivers of the signal that social, economic, or political benefits can be gained through interaction with the signaler. A person has incentive to be a successful signaler since he or she also receives benefits, some of which may include increased social status, the establishment of lucrative trading partnerships, and the selection of reliable long-term sexual and domestic partners. Two critical variables control the payoffs to a costly signal: audience size and familiarity. Signals that reach large audiences are generally more valuable than signals aimed at smaller audiences because the benefits for any given signal increase as the signal influences larger numbers of competitors. Costly signaling is also less likely to be directed at groups that contain a large number of kin since signals are less effective when directed at groups composed of allies instead of direct competitors (Neiman 1997).

Although signaling is understood as a phenotypic behavior that serves to enhance a person's long-term fitness, the form of the signal is a direct result of individual choices that are embedded in, and influenced by, the larger cultural system. Signaling is by definition a social activity that requires signalers and receivers whose interactions actively shape the form and intensity of displays (Bliege Bird and Smith 2005; Boone 2000; Neiman 1997). Successful signalers not only choose appropriate signaling media but are able to gauge the response of receivers and modify or change their signal as status values and other signal costs shift. New signals often develop within pre-established guidelines for the signal. In an example from the late eighteenth-century Atlantic world, yellow metal buttons replaced white metal buttons as fashionable clothing accoutrement while plates made from refined ceramic wares such as white salt-glazed stoneware and creamware replaced plates made from wood and pewter (Heath 1999b; Martin 1989, 1994).

As a result, signaling models are particularly useful for archaeologists precisely because systems for gaining prestige through material displays should be archaeologically visible and measurable. As Neiman has recently pointed out, "[S]ignaling models are explicit enough to deliver detailed predictions about the design and dis-

tribution of variation relative to historically specific social and environmental contexts" (2005:243).

Here the signaling model begins with the argument that the sacrifices, compromises, and physical risks required for the acquisition of nonessential goods made them ideal costly signals for slaves. Owning and wearing current fashions may have demonstrated an enslaved person's ability to work late into the night cultivating vegetables or making crafts that were then parlayed into money. Items purchased from faraway markets not only represented a slave's purchasing power but also symbolized the mobility granted to a person by his owner. Material displays of mobility may have also been a declaration of an enslaved person's resourceful ability to travel surreptitiously (Upton 1988). The display of European goods not provided by a slave owner was also filled with potential risk, lest the items and the manner in which they were displayed be perceived as a social or economic challenge to whites (Walsh 1992:9). In these ways, expensive European goods represented not only economic cost but also the willingness to risk physical threats for their acquisition and display. Honestly and effectively advertising these abilities was crucial to success when competing for mates and allies, better food, a good garden plot or house site, or even a warm place to sleep within a large crowded quarter. Costly displays of goods became an effective means of communication among enslaved individuals within regions transformed by the ebb and flow of colonial demographics.

Neither European material culture nor signaling strategies were new to recently enslaved Africans. Both Anglo and African elites used a host of European-produced goods to demonstrate their economic, political, and social abilities (DeCorse 2001; Kelly 2001; Walsh 1992). Many enslaved people understood how and what type of goods were used in successful signaling strategies. They understood both the knowledge and benefits that could be gained from conspicuous displays of costly, imported items. They in turn used the information embedded in the display to aid in their own selection of friends, mates, or cooperative household members. In addition, successful signaling may have convinced free merchants and other whites in the community to engage in legal and clandestine business or social relations. By using costly, displayable, non-provisioned items to effectively communicate their abilities and achievements within competitive and unfamiliar situations, slaves found signaling a crucial strategy for establishing advantageous social relationships, choosing mates, solidifying trading partnerships, and mobilizing collective action.

### The Signaling Media

This essay looks at the discard patterns of three artifact classes whose acquisition by enslaved people incurred substantial costs and conveyed little practical benefit: metal buttons, refined ceramics, and glass tableware (see Galle 2006 for discard

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rates of other artifact classes in the Chesapeake). Two of these artifact classes, metal buttons and refined ceramics, are particularly useful for pinpointing gendered consumption activities among slaves. A fourth less-costly imported artifact class, glass beads, adds complexity to the signaling argument.

Although buttons are one of the most common archaeological finds, their analytical importance has only recently been explored (Galle 2006, 2010; Heath 1999b; White 2002). Metal buttons possessed a number of compelling attributes that made them ideal for use in signaling displays throughout the eighteenth century. First, metal buttons, like clothing buckles, were one artifact type introduced during the consumer revolution whose acquisition by slaves incurred substantial costs and conveyed little practical benefit. They were expensive and their cost scaled with decorative treatments such as plating and engraving (Baumgarten 2002; Hinks 1988; White 2002). Unlike wood and bone buttons, metal buttons were not manufactured in enslaved households. Archaeological evidence from slave quarter sites in the Chesapeake indicate that some bone and wood buttons were manufactured by enslaved people, and buttons made from these materials have been excluded from this analysis. Both enslaved Jamaicans and Virginians found ways to acquire fashionable buttons. Archaeologist Barbara Heath's analysis of store accounts indicates that metal buttons ranked among the most popular items purchased by slaves in central Virginia between 1760 and 1790 (Heath 1999b, 2004). In Jamaica, buttons were acquired in Sunday markets (Buckridge 2004).

Fashionable clothing adorned by buttons indicated that the wearer had the skills to acquire clothes not provisioned by their owners. Jackets, waistcoats, vests, and embellished breeches, all clothing items not regularly provisioned to enslaved men, required numerous buttons. High-style eighteenth-century jackets and waistcoats featured buttons not only as decorative fasteners but also as non-functional embellishments sewn opposite false buttonholes (Baumgarten 2002). Jackets and vests with matched sets of buttons or large bright buttons set their wearer apart from the less fashionable. Finally, fashionable buttons are also one of the few artifact classes that can be associated primarily with eighteenth-century male social and economic activities. With the exception of riding habits, buttons were not used on women's clothing until the mid-nineteenth century (White 2002, 2005). Metal buttons were easily displayable items whose form and cost were finely tuned to shifting fashions. They represented, for both free and enslaved men, the perfect way to display their ability to participate in the market economy.

Visible costliness was also an important determinant in the acquisition of ceramic vessels made in "refined wares"—porcelain, thin-bodied stoneware, and refined earthenware. The introduction of refined ceramic wares in the mid-eighteenth century accompanied a host of new social rules related to the consumption of food and drink (B. Carson 1990). Ceramic manufacturers produced novel vessel forms designed for daily dining as well as the new social rituals. Individual place settings

that included dinner plates, dished plates, and bowls replaced communal trenchers and mugs. Ceramic tea bowls, saucers, and teapots, and leaded glass tumblers and stemware were used in the consumption of exotic and costly beverages such as punch, tea, and coffee. These forms and wares replaced functional equivalents traditionally made of indestructible wood and pewter or inexpensive coarse earthenware (B. Carson 1990; Martin 1989, 1994; Roth 1988). The shift in popularity to more fragile refined ceramic wares and their constantly changing forms and decorative designs represent an increase in the costs paid by consumers.

Refined imported ceramics dominate Virginia and Jamaica slave quarter assemblages and the diversity of forms and ware types clearly indicates that they were not all provided by slave owners. In Virginia, slaves purchased imported refined ceramics in stores throughout the eighteenth century (Heath 2004). Because of the lack of primary sources that indicate the distribution of imported ceramics, historians suggest that Jamaican slave owners did not provide their workers with ceramic wares (McDonald 1993; Reeves 1997:173-74). The variety and quantity of imported ceramics wares found on Jamaica slave sites also suggest that enslaved people sought specific ware types and forms.

Even though many elite men were active in choosing and purchasing ceramic wares, it is likely that middling, poor, and enslaved women who prepared and served food to both their families and the elites for whom they worked had a direct hand in the selection and purchase of their families' ceramics. Eighteenth-century accounts from Jamaica and Virginia indicate that food preparation was handled primarily by enslaved women (Ebanks 2000; Fox-Genovese 1988; P. Morgan 1998). If enslaved women had some control over the ceramics they used to prepare and serve food, high discard rates of costly ware types and vessel forms may point to a woman's economic strength or position within the plantation. On Jamaica, most marketers and higglers were enslaved women. Their direct involvement in the marketplace must have given them considerable purchasing power and consumer choice (Beckles 1989; Bush 1990:48-50).

Like refined ceramics, elaborate and costly glass tablewares were also introduced into the Atlantic markets in the early 1700s. By the mid-eighteenth century most elite households owned at least a few specialized drinking glasses. Like refined ceramics, glass tablewares were produced in a variety of specialized forms and displayed a range of decorative embellishments that correlated with cost. In addition, glass tablewares were designed to hold and display expensive foods and beverages (Elmville 1951). Tumblers and stemware were used to serve beverages that were made from costly sugar, exotic fruits, and liquors. Jelly glasses showed off sugar-infused desserts, custards, and sweetmeats. When recovered from archaeological contexts, these artifacts represent expensive and fashionable wares as well as the knowledge and financial ability to fill them (B. Carson 1990).

Unlike metal buttons, refined ceramics, and glass tableware, the acquisition of imported glass trade beads did not incur substantial financial costs. Unlike buckles

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and buttons, glass beads were not essential elements of elite dress. The lack of emphasis placed on beads in fashionable dress is reflected in eighteenth-century newspaper advertisements in which strands of beads and beaded jewelry sets are buried well below sales announcements for more fashionable dry goods that included "all sorts of gold bands, buttons, and loops" (White 2005; *Virginia Gazette* 1769:3, 1771:3).

Glass beads are one artifact category that may have arrived in the English colonies on the bodies of enslaved Africans transported through the Middle Passage. Recent research also suggests that some enslaved Africans may have acquired beads during the Middle Passage. Enslaved women were occasionally given glass beads on British ships as a means of keeping them occupied with jewelry-making activities (Handler 2009:6). The possibility that these beads represent the only material culture brought from Africa by enslaved people, along with ethnographies demonstrating that beads had, and continue to have, important spiritual properties in African societies, has resulted in a fixation on the presence of beads, especially blue beads, on archaeological sites associated with free and enslaved Africans and African Americans (Handler and Lange 1978; Handler 2009; LaRoche 1994; Russell 1997; Thomas and Thomas 2004; Stine, Cabak, and Groover 1996; Wilkie 1994, 1997). Although European goods ranging from ceramics and glassware to guns and metal tools were available to and used by Africans living in Africa during the eighteenth and nineteenth centuries (DeCorse 2001; Stahl 2001; Kelly 2001; Walsh 1992), European glass beads have been isolated by historical archaeologists as the one object on North American sites that they believe can be directly linked to African ethnic identity and spiritual traditions.

As demonstrated by Christopher DeCorse and others, a plethora of bead styles and colors were imported to and produced in Africa (Carey 1991; DeCorse 1989, 2001; Jargstorf 1995; Stahl 2001). These beads, not just blue beads, had a complex set of uses, thereby making direct associations with specific culture groups or practices problematic at best. As DeCorse points out, the abundance of blue glass beads on North American slave sites may relate more directly to their inexpensive cost in the New World and their abundance in Africa than to a shared pan-African belief system (DeCorse 1999:144). Here bead consumption is explored in relationship to other consumer trends, which allows for a more complex interpretation of the potential meaning and use behind the presence of glass beads rather than a simple one-to-one correlation with African spiritual practices.

### Signaling Expectations

Signaling theory predicts that individuals should invest more in costly goods when they interact regularly with large numbers of people and when they interact with people who know little about them. Signaling should also intensify when contextual variables help increase a person's resource-holding potential. It is anticipated

that two contextual factors, agricultural production cycles and demographics, played a significant role in an enslaved person's ability to consume metal buttons, refined ceramics, glass tablewares, and glass beads in both Jamaica and Virginia.

#### Agricultural Diversification

In the Chesapeake, agricultural and economic diversification during the second half of the eighteenth century, characterized by a shift from tobacco monoculture to the cultivation of wheat, ushered in a task-based agricultural system that provided enslaved men with greater opportunities to earn money (Isaac 1982; Walsh 1995a, 1995b). Diversification of agricultural production began in the 1730s and progressed steadily throughout the century. The task-based labor system on diversified plantations resulted in excess labor during specific points in the agricultural cycle. Many owners trained males in skilled trades such as blacksmithing, coopering, and carpentry. These skilled men were then leased to individuals, small workshops, and factories during slack periods in the agricultural cycle. Leased men were given assignments that required them to travel and work for extended periods in urban centers like Norfolk, Williamsburg, and Richmond (P. Morgan 1998; Nicholls 1990; Walsh 1995a, 1995b). Some of these assignments provided slaves with petty cash and the ability to rent rooms outside of their place of work. Although skilled jobs separated men from their families and their home plantations, the increased number of skilled occupations in the second half of the eighteenth century gave enslaved men new ways to earn money while often putting them in cosmopolitan settings that offered opportunities for novel social and business alliances.

Unlike Virginia, which began as a tobacco monoculture economy, Jamaica's economy was built on a number of different plantation types. Sugar, coffee, indigo, and livestock plantations all had strikingly different labor regimes. Labor requirements on sugar plantations were exceptionally brutal in comparison to the daily and seasonal work regimens on coffee plantations and cattle pens (Delle 1998; Higman 1976, 1995; J. Roberts 2006). The extreme physical exertion required during the twenty-four-hour sugar production cycle resulted in frequent malnourishment and severe physical debilitation for many slaves laboring on sugar plantations. One result was the strikingly low birthrates on sugar plantations (-12.4 per year) compared to those on coffee plantations (+1.8 per year) (Higman 1976:123). Physical exhaustion combined with frequent crop destruction from yearly hurricanes limited slaves' ability to produce excess food that could be sold at markets. Traveling any distance to market may have been physically impossible for some (Burnard 2004; Bush 1990; D. Hall 1987).

Like agriculturally diversified estates in Virginia, coffee plantations and cattle pens had less brutal seasonal labor demands than sugar plantations. Both coffee and livestock holdings relied on greater numbers of skilled laborers. Like skilled Chesapeake slaves, these men spent a portion of their time working in cities like

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Kingston and Spanish Town. Although coffee and cattle plantations offered less treacherous working conditions than sugar plantations, overall Jamaica maintained the highest mortality rates among slaveholding English colonies (Higman 1976).

Diversity in plantation types and agricultural regimes resulted in the development of an enslaved workforce in both Jamaica and Virginia that possessed non-agricultural skills. These individuals frequently had greater flexibility within their assigned tasks and received benefits such as cash bonuses and travel passes. Those who were hired out frequently interacted with larger groups of individuals. Successful signaling among these skilled laborers could have facilitated the exchange of knowledge and gossip, as well as opened doors for collaboration with potential mates, partners, and allies in noneconomic endeavors such as marriages, runaway attempts, rebellions, and the development of social and religious organizations. As a result, we should expect signaling, as evidenced by the discard of costly imported and displayable goods, to be positively correlated with agriculturally diversified plantations that offered greater opportunities for and payoffs to signaling.

#### Demographics

Opportunities for signaling outside one's home plantation increased in the second half of the eighteenth century in Virginia. Populations grew, urban centers expanded, and towns increased in number. This expansion allowed more people to regularly interact with non-kin in public spaces. Eighteenth-century account books from stores in central Virginia indicate that shopping excursions on Saturday afternoons and Sundays attracted diverse groups of slaves, lending a social nature to store and market visits while also providing new signaling audiences (Heath 2004). The publicly visible act of shopping, in which a slave was required to pay with cash, was an ideal platform for signaling one's ability to earn money. People would have observed the purchase of tools, ceramics, mirrors, and other goods that they might not actually see displayed or used in the signaler's dwelling. In addition to shopping, social gatherings such as attending church were ideal for displaying non-provisioned clothing and adornment items (Foster 1997; Perdue 1976; White and White 1998).

The late seventeenth- and early eighteenth-century growth of Jamaican urban centers such as Port Royal, Spanish Town, and Kingston meant that urban populations in Jamaica did not expand as dramatically through the eighteenth century as they did in Virginia (Robertson 2005). Urban life was critical, however, to a subset of Jamaica's enslaved population. Travelers' accounts from Jamaica describe scenes similar to those in Virginia in which slaves traveled together to market (P. Wright 2002:65). The social and economic activities that occurred during the trip to urban and rural markets were ideal venues for signaling displays.

Differences in the composition of enslaved populations in Jamaica and Virginia may have also impacted slave participation in the market economy. Between 1700

and 1790, roughly 78,000 enslaved Africans were imported into Virginia (P. Morgan 1998). Approximately 49,000 of the 54,000 slaves living in Virginia between 1700 and 1749 were African born and from the Bight of Benin and Angola regions (Kulikoff 1986:320; P. Morgan 1998). Language and cultural similarities shared by the majority of the enslaved population may have helped the rapid creation of a creole language and an African American culture (Kulikoff 1986:321; Walsh 2000). The high number of conspiracies and group runaway attempts throughout the 1720s, 1730s, and 1740s suggests that some African-born slaves may have quickly formed friendships and alliances that emboldened others in such endeavors (Kulikoff 1986:328–30).

By the 1770s, however, the majority of all enslaved people in the Chesapeake were born in North American colonies (C. Carson 2003; P. Morgan 1998; Walsh 2000). In just over thirty years, a community of Chesapeake-born slaves had formed, a process that resulted in a shift from “support networks based on co-resident strangers, quasi-kin, and country men and women to networks rooted primarily in biological kin ties” (Walsh 2000:2). Archaeological and architectural evidence such as the decrease in house size and subfloor pits corroborates this transition from co-residential strangers to cooperative, kin-based households (Neiman 2005, 2008).

The demographic realities of Jamaica were strikingly different with over 900,000 enslaved Africans imported into Jamaica between 1700 and 1808 (Burnard and Morgan 2001; Eltis 2001). Blacks outnumbered whites 8 to 1 as early as 1710, and 26 percent of all blacks in the British Empire lived in Jamaica by the mid-eighteenth century (Burnard and Morgan 2001). Jamaica’s high mortality and low fertility rates resulted in virtually no natural increase in the enslaved population throughout the eighteenth century (Higman 1976, 1995). Heterogeneity in the origins of enslaved Africans was a key feature of Jamaican demographics, with slaves coming from all four of the major slave-trading regions in Africa. With one-quarter to one-half of newly arrived Africans dying within the first three years on the island, there was a constant influx of unseasoned African imports (Burnard and Morgan 2001). The consistently high population of African-born slaves from diverse ethnic and language groups, high black-to-white ratios, and consistent resource stress resulted in high racial tensions and numerous rebellions on Jamaica. In the English Caribbean there were at least seven revolts involving fifty or more enslaved people between 1640 and 1713, the frequency of which only increased throughout the eighteenth century; the majority of slave uprisings during this period took place on Jamaica (Dunn 1972:164–65). By contrast, and despite conspiracies and thousands of runaways, Virginia experienced no major violent uprisings until the nineteenth century.

One final demographic aspect that likely influenced consumption among enslaved Jamaicans during the eighteenth century was the growing population of native-born enslaved women and men who were the products of mixed-race unions.

While countless unions between enslaved women and white men were the result of violence and coercion, others resulted in long-term, openly acknowledged relationships. Although it was illegal for whites to marry non-whites, many established long-term relationships with enslaved and free women of color (Brathwaite 1971). Women in these relationships and offspring from these unions were often given positions within the house or as drivers or estate managers (Brathwaite 1971; Burnard 1991, 1999). White men living in Jamaica were also much more likely to financially recognize their enslaved partners and offspring in their wills than were men in the Chesapeake (Burnard 1991, 1999; Reeves 1997; Rothman 2003; P. Wright 2002:234). Prominent positions within the owner's household or within the plantation hierarchy, as well as overt financial support and bequests, would have certainly contributed to an enslaved person's ability to actively participate in local markets.

Throughout the eighteenth century, unrelated slaves in Jamaica and Virginia formed complex and frequently illegal relationships on individual and collective scales. From marriages and clandestine trading relations to group activities such as religious revivals, fraternal organizations, runaway attempts, and rebellions, the enslaved bonded together in dangerous activities that were mutually beneficial to individuals and the group (K. Brown 1996; Finkelman 1989; French 2004; M. P. Johnson 1981; Newman 2003). In addition to aiding economic transactions, successful signaling may have facilitated the exchange of information and gossip and provided the means to assess the likelihood of success in cooperating with someone for non-economic endeavors such as marriages, runaway attempts, rebellions, and the development of social and religious organizations. Early nineteenth-century South Carolina runaway advertisements suggest just how important building non-kin relationships off home plantations may have been (M. P. Johnson 1981). Advertisements placed by slave owners between 1799 and 1830 demonstrate that many of South Carolina's urban runaways were skilled workers that had developed bonds with non-kin. Between 1799 and 1830, two-thirds of runaway groups were composed of two unrelated individuals who may have known each other through their work (M. P. Johnson 1981:421). In Jamaica, rebellions that were headed by skilled laborers were common (Higman 1998).

If signaling through consumption was a behavioral strategy at work in the eighteenth century, consumer goods should be measurable through the archaeological record. In the following signaling model, measures of costly goods represent dependent variables that should scale with the independent variables that drove consumption, such as temporal, demographic, and agricultural changes. Variations in individual signal levels should be measurable based on the type and abundance of the material culture being consumed. Differences in the quantity and quality of the artifacts ought to point to the maintenance of an active and honest costly signaling strategy (Neiman 2005).

In Virginia we should expect signaling to increase through time as urban cen-

ters grew dramatically and plantations diversified during the second half of the eighteenth century. Markets, stores, taverns, and public squares provided large audiences filled with potential sexual partners, allies, and competitors, all of which increased the payoffs for signaling. Agricultural diversification resulted in the development of a skilled corps of enslaved workers, many of whom gained more mobility and earned more money as the century progressed. In contrast, we should not expect consumption of costly goods in Jamaica to rise dramatically throughout the eighteenth century. The establishment of large urban centers as well as the existence of many different plantation types by the 1690s suggests that signaling systems may have developed as early as the first few decades of the eighteenth century. However, different plantation types and the demographics of the island should play a factor in signaling strategies through the eighteenth and nineteenth centuries.

While the majority of people of African descent in the greater Chesapeake region had established families with second- and third-generation members, the rates of first-generation enslaved Africans in Jamaica remained high throughout the eighteenth century. We might then expect a range of African social, linguistic, and spiritual traditions to be stronger and more active in Jamaica than on the North American mainland. This difference—established African American households with greater experience and contact with European customs and material culture versus a consistently high African-born population—may well be expressed in differential discard of signaling media in Jamaica and Virginia.

### Measuring Signal Variation

Two significant challenges confront archaeologists undertaking regional comparative studies. The first is the availability of standardized artifact data from multiple sites. The second is the development of analytical methods that acknowledge that each assemblage was excavated from sites with different depositional and excavation histories. As a result, most archaeological studies of slavery focus on a single site or only compare sites from a single plantation that were excavated by the same principal investigator using similar methods (Armstrong 1990; Fesler 2004; Heath 1999a; Higman 1998; B. Thomas 1998). Archaeologists who have executed successful comparative research from multiple plantations either focus on a single artifact class (Agbe-Davies 2004; Neiman and King 1999) or limit their comparisons to architectural data that can be gleaned from site maps (Neiman 2008; Samford 2000, 2007). This broadly comparative study is made possible by the availability of fine-grained standardized artifact data generated by the Digital Archaeological Archive of Comparative Slavery (DAACS, [www.daacs.org](http://www.daacs.org)), a Web-based initiative that currently provides quantitative artifact and context data from over thirty excavated slave quarter sites located in the Chesapeake, Carolinas, and Caribbean. All data used in the following analysis are available through the DAACS Web site, with the

exception of the data from the Thetford and Juan de Bolas plantations in Jamaica, which were generously provided to me by Matthew Reeves (see Reeves 1997 and this volume for more information about his research).

The data used in the following analysis come from twenty-one slave site occupations in Jamaica and seventeen slave site occupations in Virginia. Both the Jamaica and Virginia sites have distinct occupational phases that most likely represent different households, thereby allowing for the analysis of discrete episodes of consumption and discard within sites. A total of thirty-eight phased assemblages, each representing different household occupations, contribute to this analysis (Tables 11.1 and 11.2).<sup>1</sup>

The Jamaica sites used in this study were excavated from four different plantations, two located along the north coast and two from central Jamaica. Sugar was the cash crop at the New Montpelier, Seville, and Thetford plantations. The Juan de Bolas Plantation sites used in this study date from the coffee production phase of the plantation (see Figure 1.1). Most of the Jamaica sites in this study were occupied slightly later than the majority of the Virginia sites, with most having mean ceramic dates (MCDs) in the early nineteenth century. The Virginia slave sites used in this study are located on five plantations, four of which were agriculturally diversified. These sites were occupied from the late seventeenth through early nineteenth centuries and are scattered across the Coastal Plain and Piedmont regions of Virginia (Figure 11.1).

### The Statistical Methods

Three main statistical methods were used to analyze the large quantity of artifact data from these sites and to test the signaling expectations: abundance indexes, generalized linear models (GLMs), and principal components analysis (PCA). This section provides a brief overview of these methods. (More detailed discussion can be found in Galle 2006.)

*The abundance index.* An abundance index is used to estimate discard rates of the four artifact classes relative to a baseline discard rate, with the assumption that the base discard rate of the denominator class either does not change or, if the base discard rate does change, it does so in a predictable manner. Here the abundance index (AI) is estimated as

$$AI = (\text{Artifact Type 1}) / [(\text{Artifact Type 1}) + (\text{Artifact Type 2})]$$

where Type 1 is the artifact group whose variation in discard we are interested in measuring and Type 2 represents the base discard rate. Unlike relative frequencies, the AI works by using a single artifact class as the Artifact Type 2 denominator value. By reducing the Artifact Type 2 value to a single artifact class, one only has to be concerned with correlated discard rate variation in a single denominator

Table 11.1 Jamaican Assemblages

Plantation	Site Name	Occupation	BLUE MCD	Region	Plantation
		Phase			Type
New Montpelier	House 24		1820	Jamaica	Sugar
New Montpelier	House 26		1790	Jamaica	Sugar
New Montpelier	House 37		1805	Jamaica	Sugar
Seville	House 15	Phase 1	1772	Jamaica	Sugar
Seville	House 15	Phase 2	1788	Jamaica	Sugar
Seville	House 15	Phase 3	1822	Jamaica	Sugar
Seville	House 16	Phase 1	1761	Jamaica	Sugar
Seville	House 16	Phase 2	1772	Jamaica	Sugar
Seville	House 16	Phase 3	1781	Jamaica	Sugar
Seville	House 16	Phase 4	1787	Jamaica	Sugar
Thetford	House 41		1797	Jamaica	Sugar
Thetford	House 42		1797	Jamaica	Sugar
Thetford	House 43		1797	Jamaica	Sugar
Thetford	House 44		1797	Jamaica	Sugar
Thetford	House 45		1823	Jamaica	Sugar
Juan de Bolas	House 11		1803	Jamaica	Coffee
Juan de Bolas	House 21		1798	Jamaica	Coffee
Juan de Bolas	House 22		1805	Jamaica	Coffee
Juan de Bolas	House 24		1812	Jamaica	Coffee
Juan de Bolas	House 31		1797	Jamaica	Coffee
Juan de Bolas	House 32		1799	Jamaica	Coffee

Table 11.2 Virginia Assemblages

Plantation	Site Name	Occupation	BLUE MCD	Region	Plantation
		Phase			Type
Monticello	Elizabeth Hemmings		1799	Virginia	Wheat
Monticello	Building o	Phase 2	1785	Virginia	Tobacco
Monticello	Building o	Phase 3	1791	Virginia	Wheat
Monticello	Building l	Middle Phase	1796	Virginia	Wheat
Monticello	Building s	Phase 1	1798	Virginia	Wheat
Monticello	Building s	Phase 2	1803	Virginia	Wheat
Monticello	Building r	Early Period	1796	Virginia	Wheat
Monticello	Site 7	Phase 3	1788	Virginia	Tobacco
Monticello	Site 8	Phase 3a	1797	Virginia	Tobacco
Monticello	Site 8	Phase 3b	1790	Virginia	Tobacco
Monticello	Site 8	House 1	1778	Virginia	Tobacco
Stratford Hall	ST116		1787	Virginia	Wheat
Poplar Forest	Quarter		1795	Virginia	Wheat
Poplar Forest	North Hill		1796	Virginia	Tobacco
Utopia	Structure 40		1749	Virginia	Wheat
Utopia	Structure 50		1764	Virginia	Wheat

plantation  
Type

Sugar  
Coffee  
Coffee  
Coffee  
Coffee  
Coffee  
Coffee

plantation  
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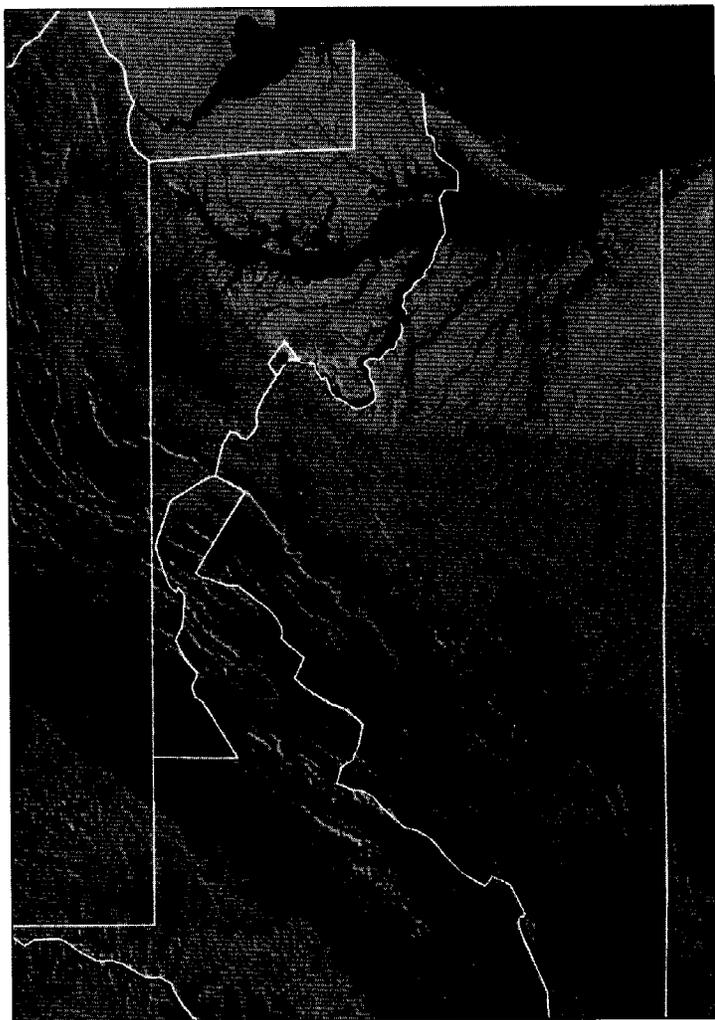


Figure 1.1.1. Map of Virginia showing plantations contributing sites to this analysis.

class, not in scores of artifact classes. Abundance indexes are therefore less affected by random variation in occupation intensities, durations, and site formation processes than densities since these factors equally affect both the denominator and the numerator artifact classes.

This method for estimating discard rates was derived from large and small mammal measures used in optimal foraging applications (Ugan and Bright 2001). Recently, abundance indexes have been developed for use on historic period sites to estimate artifact discard on late eighteenth-century slave quarter sites at Monticello (Galle and Neiman 2003; Neiman, McFaden, and Wheeler 2000), eighteenth- and nineteenth-century sites in the Chesapeake (Galle 2010), and early to mid-nineteenth-century sites at The Hermitage Plantation in Tennessee (Galle 2004). The challenge in using this abundance index is identifying the appropriate denominator class (Artifact Type 2) that has a discard rate that is either relatively constant across sites or that has a discard rate that varies predictably over time. For this study, wine bottle glass was found to be the most consistently discarded artifact class, and it is used as Artifact Type 2 for each site in this analysis (Galle 2006).<sup>2</sup>

*Generalized linear models: negative binomial regression.* For each assemblage, the abundance index provides an estimate of variation in the discard of metal buttons, ceramics, beads, and table glass.<sup>3</sup> As we'll see, the differences in the discard of costly goods among sites raise questions about the different historical variables that may have influenced the acquisition and discard of these artifact types. One way to address these questions is to use a statistical method that estimates the overall effect of independent historical and archaeological variables on the abundance of a given artifact class in a given assemblage while holding constant the variation in the other independent variables in the model.

A variety of methods can be used to evaluate the effect that independent historical and contextual variables had on artifact abundance. Since the AI provides reliable proportional abundance measures, generalized linear models (GLMs) offer a powerful statistical method for testing the effects that time and plantation type had on the use and discard of artifacts at sites in Jamaica and Virginia. Generalized linear models are a form of regression that handles non-Gaussian errors and nonlinear relationships. Introduced in the early 1970s, and most fully developed by McCullagh and Nelder (1989), GLMs subsume traditional approaches to multiple regression, analysis of variance, and analysis of covariance while also including relatively new methods such as logistic, Poisson, and negative binomial regression. Two generalized linear models that use the log link function and negative binomial error distribution were used here. One tests the effects of time on consumption ( $y = \text{AI scores}$  and  $x = \text{MCD}$ ) while the other tests the effects of time and plantation type on consumption ( $y = \text{AI scores}$  and  $x_1 = \text{MCD}$ ,  $x_2 = \text{plantation type}$ ). The Pearson Goodness-of-Fit statistics for the negative binomial GLMs were all close to 1, indi-

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cating that the negative binomial models account for over-dispersion in the artifact samples used in this study.<sup>4</sup>

### Consumption and Time

Although the archaeological assemblages of enslaved households in Virginia and Jamaica appear to have very similar types of material culture, the abundance index results and regression models highlight a number of key differences in the consumption patterns in these two regions. First, the abundance indices for metal buttons, refined ceramics, and glass tableware demonstrate that enslaved Virginians discarded much higher quantities of costly imported goods at increasing rates throughout the eighteenth century than did their counterparts in Jamaica (Figures 11.2a–d). The regression estimates and *p*-values from the negative binomial regression models indicate that the consumption of costly metal buttons, refined ceramics, and glass tableware had a significant positive correlation with time. The temporal effects on consumption in Jamaica are murkier. Although there appears to be a slight increase in the discard of these goods on Jamaica sites through time, there is no statistically significant relationship between time and the discard of costly imported goods by enslaved Jamaicans.

Enslaved men and women clearly responded to the changing social, demographic, and economic environment in Virginia during the second half of the eighteenth century. As Chesapeake demographics shifted—population increased, urban centers grew, and venues for interaction expanded—many enslaved people increased their investment in costly or difficult-to-obtain objects as the social and economic environment became increasingly competitive. The temporal trends meet the expectation that signaling among the enslaved increased as Chesapeake plantations diversified, towns grew, and social and economic opportunities expanded.<sup>5</sup> The discard of costly goods on Jamaica sites did not increase throughout the eighteenth century. As anticipated, the discard of refined ceramics and metal buttons on Jamaican sites remained relatively constant over time since sugar plantations, cattle pens, and urban centers were fully developed in Jamaica by the early eighteenth century. As a result, changes in agricultural regimes or dramatic population growth did not have significant positive effects on the discard of costly imported goods over time in Jamaica.

### Consumption and Agriculturally Diversified Plantations

Generalized linear models allow us to test the effects of multiple contextual variables that might be influential in the consumption of these costly goods. Here a negative binomial regression model holds the influence of time constant while testing to see if a plantation type impacts an enslaved household's ability and desire to participate in the market economy ( $x_1 = \text{MCD}$ ,  $x_2 = \text{plantation type}$ ,  $y = \text{AI}$ ).

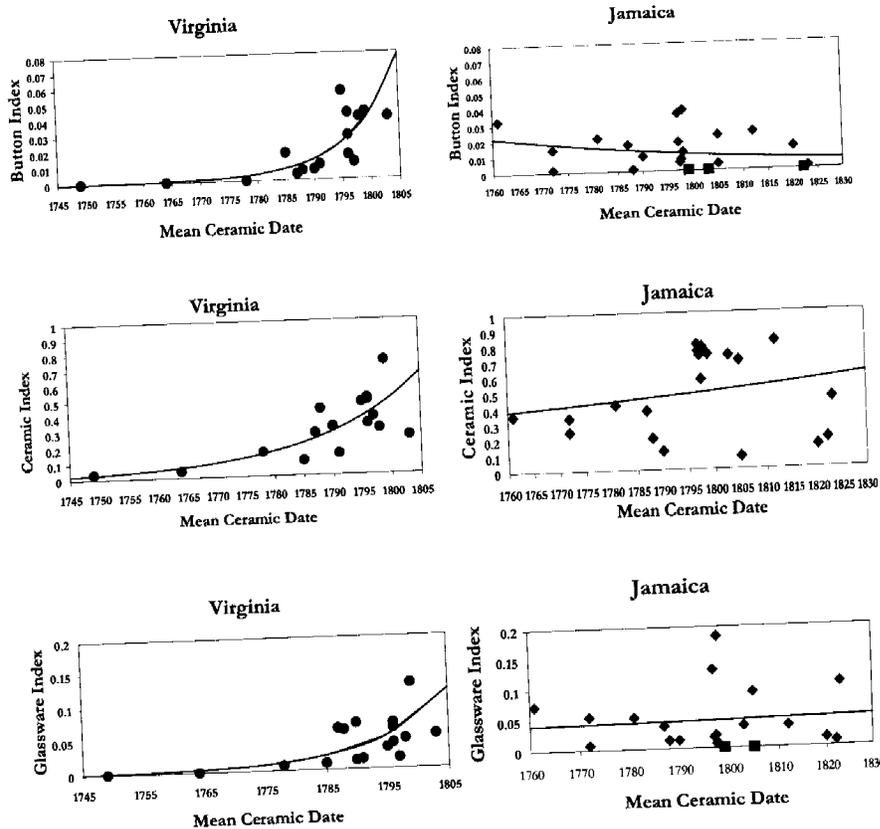


Figure 11.2. Abundance index for metal buttons, refined ceramics, and glass beads plotted against mean ceramic dates: (a) metal buttons from Virginia assemblages ( $b = .11$ ;  $p = <.0001$ ); (b) metal buttons from Jamaica assemblages ( $b = -.01$ ;  $p = .23$ ); (c) refined ceramics from Virginia assemblages ( $b = .05$ ;  $p = <.0001$ ); (d) refined ceramics from Jamaica assemblages ( $b = .006$ ;  $p = .5$ ); (e) glass beads from Virginia assemblages ( $b = .28$ ;  $p = .03$ ); (f) glass beads from Jamaica assemblages ( $b = .003$ ;  $p = .85$ ). Parameter estimates for glasswares from Virginia assemblages are  $b = .083$ ;  $p = .0007$  and for Jamaica assemblages  $b = .002$ ;  $p = .82$ .

Although time had no impact on the consumption habits of enslaved Jamaicans, plantation type did have a significant positive effect on the use and discard of metal buttons and refined ceramics. Figures 11.3a and 11.3b demonstrate that people living and working at the Juan de Bolas coffee plantation were statistically more likely to have fashionable and imported goods than were people living on sugar plantations. Factors such as distance to urban centers and owner presence were not significant determinants of the use and discard of costly goods, which is not surprising as the Juan de Bolas households were not located closer to cities than were the

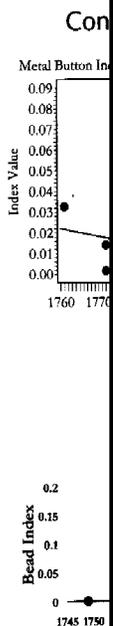


Figure 11.3. A Jamaica assemblage plantation type on plantation assemblage. Jamaica assemblage this GLM for

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## Consumer Activities of Enslaved Men and Women / 231

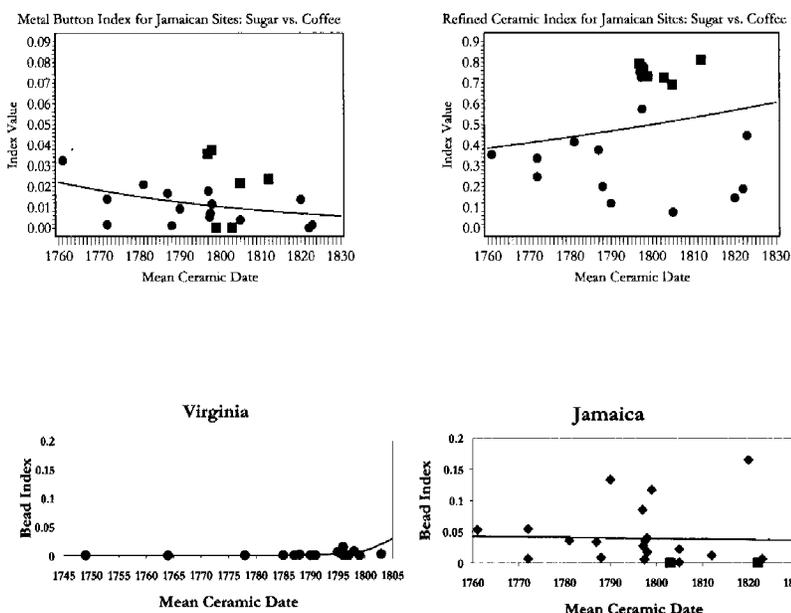


Figure 11.3. Abundance index for metal buttons, refined ceramics, and glass beads from Jamaica assemblages plotted against mean ceramic dates where  $y = AI$ ,  $x_1 = MCD$ , and  $x_2 =$  plantation type. Squares represent coffee plantation assemblages, diamonds sugar plantation assemblages; (a) metal buttons from Jamaica assemblages; (b) refined ceramics from Jamaica assemblages; (c) glass beads from Jamaica assemblages. Parameter estimates for this GLM for both Jamaica and Virginia assemblages are provided in Table 11.3.

sugar plantations in this study. These results confirm recent findings by Matthew Reeves (this volume). Although data from additional coffee plantation sites would be ideal, these preliminary conclusions strongly suggest that people enslaved on coffee plantations had greater opportunities and incentives to earn money and engage in local market economies than did their contemporaries on sugar plantations. In this analysis, distance to market was not a factor in slaves' ability to earn and spend money in markets.

### Consumption and Demographics

Patterns in the use and discard of glass beads on slave sites in Virginia and Jamaica are particularly remarkable. Glass beads are one category of imported goods that did not incur substantial costs. Whether purchased in the North American and Caribbean colonies, carried on the bodies of enslaved Africans during the Middle Passage, or acquired on that journey, glass beads most likely served a range of uses from individualized fashion displays to expressions of ethnic or spiritual affiliation. Unlike the discard of costly imported artifacts such as buttons, ceramics, and

Table 11.3 Negative Binomial Regression Estimates for Time and Agricultural Diversification ( $y$  = AI scores,  $x_1$  = MCD, and  $x_2$  = agricultural diversification)

	Estimate	Wald 95% Confidence Limits		P
		LCL	UCL	
Button Index, Jamaican Sites				
MCD	-.03	-.05	-.003	.028
Diversified	1.3	.38	2.2	.005
Button Index, Virginia Sites				
MCD	.12	.05	.19	.0003
Diversified	-.08	-.85	.66	.8
Refined Ceramic Index, Jamaican Sites				
MCD	-.0008	-.017	-.15	.92
Diversified	.67	.16	1.19	.01
Refined Ceramic Index, Virginia Sites				
MCD	.05	.03	.07	<.0001
Diversified	-.12	-.51	.27	.54
Glassware Index, Jamaican Sites				
MCD	.002	-.02	.02	.82
Diversified	.07	.27	1.4	.88
Glassware Index, Virginia Sites				
MCD	.08	.03	.13	.0007
Diversified	.21	-.48	.91	.54
Glass Bead Index, Jamaican Sites				
MCD	.003	-.02	.03	.84
Diversified	-.03	-1.1	1.1	.95
Glass Bead Index, Virginia Sites				
MCD	.28	.02	.53	.03
Diversified	-.98	-2.80	.89	.3

glassware, here we see that enslaved Jamaicans discarded greater quantities of glass beads than those living in Virginia (Figures 11.2e and 11.2f).

Perhaps even more critical is that the high discard rates of beads on Jamaican sites have no significant positive correlation with residency on a coffee plantation (Table 11.3). In fact, sites with the highest discard of glass trade beads are households from the New Montpelier sugar estate, which the archaeological record indicates is among the most resource-stressed plantations in the sample (Figure 11.3c). As will be discussed in greater detail, New Montpelier had high yearly import rates of newly enslaved Africans between 1790 and 1807.

High discard rates of glass beads may be one of the only archaeological signatures of the high sustained rates of African importation into Jamaica throughout the eighteenth century. It is likely that many individuals arrived with beads around their necks or waists or in their hair. Other enslaved Jamaicans may have purchased beads at local markets for use in personal adornment or rituals, or as inexpensive reminders of the places they were raised. In Jamaica, glass beads may have been an important signal of traditions, customs, lineages, and religious beliefs for the multitudes of newly arrived enslaved Africans.

#### Consumption and Gendered Choices

Principal component analysis (PCA) is a statistical method that enables us to further interrogate the archaeological record by isolating the specific consumer actions of individual enslaved households within each region. PCA analyzes the residuals from the bivariate temporal regression models ( $x = \text{MCD}$  and  $y = \text{AI}$ ) and reduces the complexity of the data sets by transforming the Pearson residuals into vectors that can be plotted visually along two or three principal components.<sup>6</sup> In doing so, it isolates and highlights the artifact classes that account for the greatest variation within the sites. When using artifacts that can be generally associated with gendered activities, it is possible to see the influence of male and female consumer behaviors in the archaeological record. The following PCA uses residuals from regression models for two artifact classes associated with gendered consumer behavior: metal buttons that represent male fashionable display and refined ceramics that may represent female dining strategies. The biplots also include residuals from the glass bead regression models.

The PCA correlation matrix and biplot for Jamaican households demonstrate that the discard rates of refined ceramics and metal buttons are positively correlated (Figure 11.4). Jamaican households with above-average consumption of buttons also had above-average access to refined ceramics. Bead consumption is also positively correlated with button consumption, but it is not correlated with the discard of refined ceramics. Among enslaved Virginia households, button and refined ceramic consumption are not correlated. On these sites, individuals or households appear to have focused their consumption efforts on a single class of fashionable goods: metal buttons or refined ceramics. The lack of correlation suggests that many enslaved Virginians used signaling strategies that involved only one type of fashionable object.<sup>7</sup> Jamaican slaves who could afford buttons were also likely to invest resources in the acquisition of costly refined ceramics.

These biplots suggest that there were three different types of consumer behavior at work in both regions, two of which I consider the result of gendered signaling strategies. The first type of consumer behavior comprises enslaved households with residuals that fall in the negative range along principal component 1 (Figures 11.4c and 11.4d). Households in this group consumed far fewer metal buttons and re-

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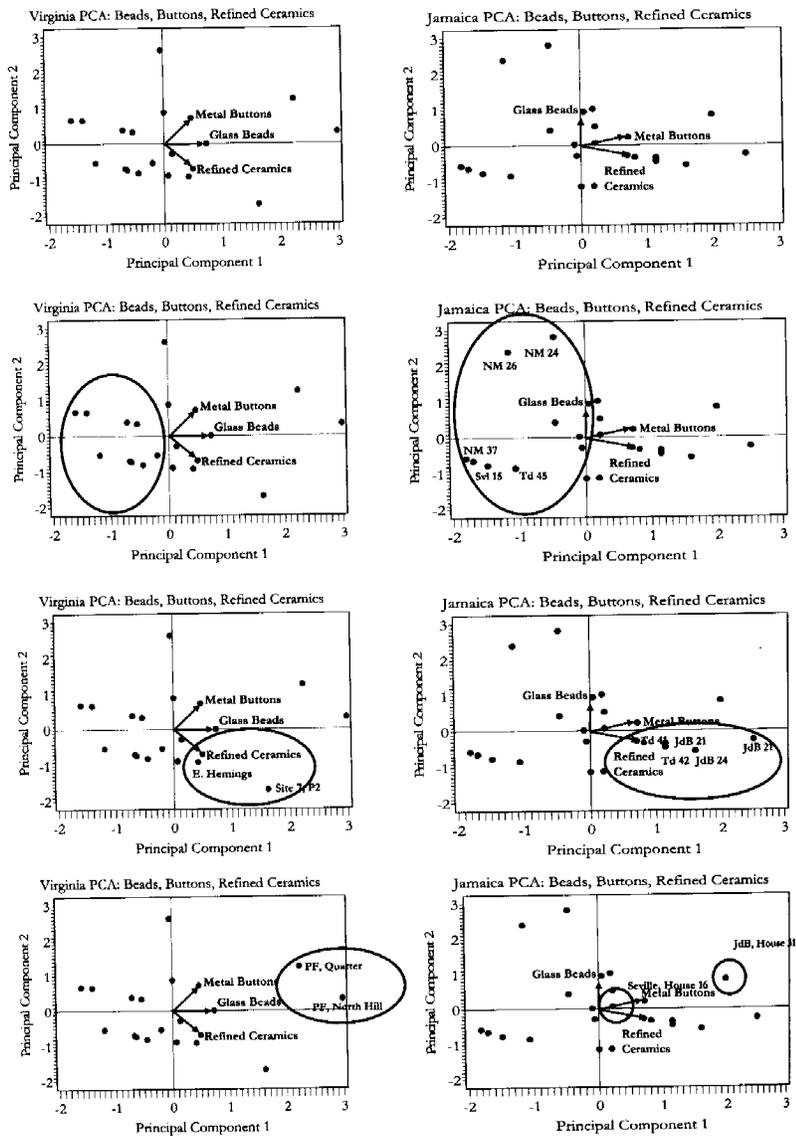


Figure 11.4. Principal component analysis (PCA) using artifact residuals from metal button, refined ceramic, and glass bead GLMs from Virginia and Jamaica assemblages where  $x = \text{MCD}$  and  $y = \text{AI}$ : (a and b) PCA for Virginia and Jamaica assemblages without signaling groups indicated; (c and d) group 1 represents low-level signalers characterized by the underconsumption of metal buttons and refined ceramics; (e and f) group 2 represents female and/or successful, cooperative household signaling strategies defined by high refined ceramic consumption; (g and h) group 3 represents male signaling strategies focused on high metal button consumption.

## Consumer Activities of Enslaved Men and Women / 235

financed ceramics than predicted by the temporal models. In Jamaica, only sites located on sugar plantations, such as House 37 at New Montpelier, Houses 44 and 45 at Thetford Plantation, and House 15 at Seville, fall into this category. Two of the three plantations, Thetford and New Montpelier, were administered by absentee owners who placed overseers and managers in charge of their human chattel (Higman 1998; Reeves 1997). Low-level consumption of expensive and fashionable ceramics and buttons at these sites suggests that if enslaved individuals did participate in the market economy, they may have done so in exchange for perishable goods that left no archaeological trace. Any gains from the sale of excess produce or craft products were mainly applied to the purchase of necessary perishable items that were otherwise unobtainable. A number of regional factors, such as the brutal labor requirements of sugar plantations, high African imports, the scarcity of owner-occupied sites, and black-to-white ratios, may have been significant factors in suppressing the consumption rates of nonessential imported goods among enslaved Africans at these sites.

A few Jamaican households, specifically Houses 14, 24, and 26 at New Montpelier Plantation, discarded more glass beads than expected by the temporal model. At Montpelier, more than 25 new enslaved Africans were brought to the plantation each year between 1790 and 1807 to offset the low fertility and high mortality rates on the plantation (Higman 1998:36). Juan de Bolas, House 32, which falls into the high-signaling group for metal buttons, also had enough glass beads to influence its placement on the biplot (see also Figure 11.3c). Documents indicate that the early nineteenth-century enslaved community at Juan de Bolas was 90 percent African born (Reeves 2000). High importation rates may well account for the large quantities of beads discarded at Juan de Bolas and New Montpelier.

After the abolition of the British slave trade in 1807, the New Montpelier slave population declined steadily until emancipation (Higman 1998:36–37). During this time, slaves from the eastern part of the island were purchased and brought to Montpelier, and many were moved among the three neighboring plantations owned by Charles Seaford: New Montpelier, Old Montpelier, and Shettlewood. High rates of imported African captives prior to 1807, the steady decline in the enslaved population after 1807, and the lower-than-expected levels of ceramic and button consumption indicate that enslaved people at Montpelier were under tremendous stress. These factors may have also been catalysts for the participation of Montpelier slaves in one of the largest rebellions in Jamaica's history. Between December 1831 and January 1832, 20,000 to 50,000 slaves burned large swaths of St. James Parish, with violence spilling into the neighboring parishes (Higman 1998:262). Many slaves from Old and New Montpelier and Shettlewood participated in the rebellion. Enslaved rebels destroyed the plantation works and residences, with the exception of the slave villages, at both Old and New Montpelier plantations. At least eleven enslaved men from Old and New Montpelier and Shettle-



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wood were hanged or whipped for their involvement in the Christmas uprising (Higman 1998:275).

Of the Montpelier and Shettlewood men captured and charged for playing leading roles in the uprising, four were field hands and seven were skilled laborers—one blacksmith, one driver, two head masons, two masons, and one carpenter. Two were African born and all eleven were considered black. Most of these men owned cattle, pigs, poultry, and controlled provision grounds of over 1.5 acres each. Lord Seaford was mystified when he learned the identities of the rebels and wrote that these headmen "had been treated with the greatest indulgence, who were the most intelligent and most civilized, and whose situation has been in all respects the most comfortable" (Higman 1998:274). As leaders of the rebellion living on a resource-stressed plantation, it is likely that their skills, personal resources, and knowledge of the local landscape helped mobilize their fellow slaves to participate in such a large-scale rebellion.

The second consumption group comprises households that consumed refined ceramics in much greater quantities than anticipated by the temporal model, almost to the exclusion of metal buttons (Figures 11.4e and 11.4f). This group may represent kin-based households anchored by women who held positions in the main house or surrounding dependencies. As anticipated, house sites from the Juan de Bolas coffee estate dominate this group for Jamaican assemblages (Figure 11.4f). At the Thetford sugar estate, Houses 41 and 42 contained disproportionately more imported ceramics than other sites on the sugar plantation, and Reeves notes that their location removed from the sugar works and other slave houses may indicate that their occupants held prominent positions within the plantation hierarchy (Reeves 1997:278). In Virginia, the Elizabeth Hemmings site displays high quantities of particularly costly ceramics, such as Chinese porcelain tableware. Located 350 feet south of Mulberry Row and Monticello Mansion, and relatively isolated from other buildings, the site was occupied by Elizabeth Hemmings, the unmarried matriarch of a large extended enslaved family that included Thomas Jefferson's offspring. At the Hemmings household, and among the high ceramic consumers from Thetford and Juan de Bolas, signaling may have taken on intimate forms of costly displays through small group dining and tea rituals.

The third type of consumer behavior seen in the biplots focused on expensive metal buttons. Houses 31 and 32 at Juan de Bolas and House 16 at Seville in Jamaica and the Quarter site and the North Hill site at Poplar Forest in Virginia dominate this group (Figure 11.4). These households discarded fashionable buttons at higher rates than anticipated by the model and may have been occupied by young, mobile, unattached men whose desire for high-quality mates or social allies spurred expenditures on costly and easily displayable fashions. Recent research on stylistic change in metal button decoration suggests that residents at the Poplar Forest Quarter were consciously discarding usable but unfashionable white metal buttons in favor

of more costly, fashionable yellow metal buttons (Galle 2010:34; Heath 1999b). Men may have been displaying their knowledge of and ability to maintain current fashions through the discard of usable but unfashionable buttons.

Residents at the Poplar Forest Quarter and North Hill sites consumed more metal buttons than any other household in this study. Although we don't know who lived in these houses, about fifteen unmarried men and nineteen unmarried women between the ages of fifteen and twenty-five lived at Poplar Forest during the early 1790s and 1800s (Heath 2005). In light of this uneven sex ratio, young men at Poplar Forest may have used buttons as part of a signaling system that appealed to women living both on and off the plantation. In 1823, well after the abandonment of the North Hill site, four men between the ages of nineteen and twenty-nine were convicted of attacking an overseer at Poplar Forest (Heath 1999a). These men were sold to New Orleans, but their collective action, like the actions of their counterparts at Montpelier in Jamaica, raises the possibility that signals which communicated independence and a willingness to take physical and emotional risks were crucial means for organizing different types of collective action.

Unrelated slaves in Jamaica and Virginia came together with some regularity to run away and rebel (Finkelman 1989; French 2004; Higman 1998; M. P. Johnson 1981). Costly and highly visible items such as buttons may have communicated a person's ingenuity, ability, and motivation to circumvent an owner's or overseer's direct control, attributes that may have been valued when seeking partners for resistance and rebellion. Men living in these Jamaican and Virginia households may have invested in fashionable male displays that helped smooth economic transactions and created social ties with other slaves or free blacks in the area.

### Conclusion

Archaeological studies of slavery often argue that the presence of expensive or unusual, non-provisioned objects are complex expressions of African and African American identity and resistance to the dominant power structure. However, the expression of individual identity through the use of goods would not result in the strikingly consistent patterns of discard seen on sites in Jamaica and Virginia. Identity should instead manifest itself in individual material expressions that are not correlated with plantation type or temporal change. Signaling as a form of communication among the enslaved offers an explanation for the uniform material patterns seen at these sites. Knowledge of how buttons and refined ceramics were used, by whom and in what contexts, points to gendered consumer strategies that left room for individual expression in the styles that were chosen and in how goods were displayed or worn. However, the data suggest that enslaved individuals focused their consumption efforts on specific types of costly goods that would offer the highest payoff to their signaling displays.

Data from thirty-eight assemblages indicate that plantation type, demographics, and time had a significant, positive influence on enslaved individuals' abilities and incentives to participate in the consumer revolution. In Virginia, the shift from tobacco to wheat cultivation and the growth of urban centers provided enslaved people greater opportunities to participate in the market economy. People enslaved on Jamaican coffee plantations, like those enslaved on diversified plantations in Virginia, had greater opportunities to earn money, to travel, and to engage in novel social and business activities. As expected by the signaling model, discard rates of costly goods that played an important role in signaling systems were higher on coffee and wheat plantations where incentives and opportunities for signaling were greater than on sugar or tobacco plantations.

Higher rates of glass bead discard in Jamaica and the lack of correlation between high bead discard and residency on coffee plantations indicate that beads were not consumer goods sought by enslaved people in either Jamaica or Virginia. Together, the archaeological patterns and documentary record strongly suggest that high abundance index scores for glass beads point to sites with first-generation enslaved Africans. The exceptional importation rates of enslaved Africans into Jamaica throughout the eighteenth century may explain the high rates of glass bead discard on Jamaican sites compared to the exceptionally low discard on Virginia sites, which are likely due to the fact that second-, third-, and fourth-generation enslaved African American families were thriving in the Chesapeake by the 1770s. Positive natural increase among the enslaved in Virginia resulted in much lower importation rates, hence fewer glass beads arriving on newly arrived captives.

Large-scale comparative analysis of archaeological data has the power to change our historical understandings of enslaved participation in markets in Jamaica and Virginia. Traditional histories suggest a vibrancy and level of financial investment in Jamaican markets that was not present in the North American colonies, where slave participation in markets was illegal. The archaeological record indicates that while many enslaved Jamaicans acquired nonessential and expensive imported goods, many more living on sugar plantations rarely purchased imported goods, and if they did participate in markets regularly, they mainly acquired perishable consumables such as food and clothing that left little or no trace in the archaeological record. In Virginia, where slave participation in markets was illegal, changing agricultural regimes and demographics offered many slaves, especially men, ample opportunities to purchase and display costly, imported goods at rates similar to those seen in Jamaica. By the late eighteenth century, the discard of costly imported goods on slave sites in Virginia rivaled the discard of those same goods by slaves in Jamaica. In Virginia, however, slaves conducted their purchases illegally, while enslaved Jamaicans did so within a legal, thriving market system created in large part by and for them.

The consumption patterns in these slaveholding societies with different ap-

proaches to an enslaved person's role in local markets allow us to begin unraveling the complex historical and contextual mechanisms that drove slave participation in local economies throughout the Atlantic world. It is here that signaling through costly goods becomes most apparent, with slaves in Virginia willing to risk the dangers inherent in market participation to purchase and display buttons and refined ceramics as signaling opportunities throughout the Chesapeake expanded in the late eighteenth century. High rates of discard on sites in Jamaica throughout the eighteenth century indicate that some enslaved individuals in Jamaica, especially those living on coffee plantations, also sought costly, imported goods. Buttons and refined ceramics certainly reflected personal consumer choices but, perhaps more significant, signaled an enslaved person's ability to purchase goods not provided by the owner that were fashionable and not essential to survival in one of the harshest slave-based societies in the Atlantic world.

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### Notes

1. Following Neiman and Smith (2005), Best Linear Unbiased Estimator Mean Ceramic Dates (referred to here as BLUE MCDs) were used to calculate mean dates for each occupation phase. BLUE MCDs are calculated using:

$$MCD_{BLUE} = \sum m_j p_j \left( \frac{1}{s_j/6} \right)^2$$

where  $m_j$  is the manufacturing midpoint of the  $j$ 'th type,  $p_j$  is its relative frequency, and  $s_j$  is its manufacturing span. BLUE MCDs give less influence to ceramic types with long manufacturing spans. In doing so, it assumes that type frequencies are Gaussian over

time, with standard deviations set to  $\frac{1}{6}$  the documented span. The BLUE MCDs used in this analysis were calculated using MCD-types posted on the DAACS Web site: <http://www.daacs.org/aboutDatabase/MCDTypes.html>.

2. Detailed descriptions of these GLMs and methods used in the subsequent principal components analysis are available in Galle 2006, 2010.

3. Kendall's tau correlation coefficients for artifact densities and abundance indexes were calculated for seven artifact classes by time, in this case represented by each site's MCD. The seven artifact classes included buckles, buttons, coins, refined ceramics, coarse ceramics, tobacco pipes, and wine bottle glass. The discard of wine bottle sherds had no correlation with time in Jamaica and Virginia. Discard of the other artifact classes had either strong positive or negative correlations with time, with the exception of coarse ceramic wares, which had only a subtle negative correlation with time. Coarseware discard estimates decreased slightly throughout the eighteenth century but they did so in a predictable manner. Coarseware could have also been used as the denominator class; however, the predictable decrease in discard throughout the eighteenth century would have been reflected in slightly elevated slopes for all artifact classes when index scores are generated using a Coarseware Index relative to abundance scores resulting from the Wine Bottle Index used here. For more information on using abundance indexes on historic-period sites, see Galle 2006.

4. For additional details on these regression models, see Galle 2006. GLMs have two key properties that allow them to handle both linear and nonlinear relationships as well as a number of different variable types and error distributions (Crawley 1993:167-68; Gill 2001). First, GLMs allow researchers to define the error structure contained within the dependent response variables being analyzed. Archaeologists work with a variety of data types, each with its own error distribution. Continuous data, such as sherd thicknesses, rim diameters, and tobacco pipe bore diameters, can be modeled effectively using normal Gaussian distributions. Count data, such as the number of ceramic sherds in a sample, and proportional data, such as an AI score, have non-normal distributions. GLMs allow researchers to specify the error distributions that are appropriate to the data being modeled.

Second, GLMs use link functions to model nonlinear relationships between a set of linear predictors and the predicted or mean value of the dependent variable. Link functions are used to correctly identify the functional form of the relationship between the dependent (X) and independent (Y) variables and different link functions help distinguish one member of the GLM family from another (Crawley 1993; Liao 1994:4). The type of link function used is reliant on the distribution of the dependent data (Liao 1994:5).

Traditional linear regression techniques most frequently used by archaeologists, which include analysis of variance and analysis of covariance (Shennan 1988), require a continuous dependent variable and assume that the error distribution is normal or Gaussian (Liao 1994:1). As noted above, continuous variables with assumed normal

distributions include those such as sherd size and sherd thickness. For continuous data, GLMs provide an identity link function that connects the dependent Y variables to the linear predictor ( $\eta$ ). With the identity link function, the independent X variables are used to predict the mean of Y, where  $\eta = \mu$  where  $\mu$  = the predicted mean value of Y given a particular X value. The identity link is functionally inappropriate for proportional or count data like those used in this analysis. When the identity link is used with count or proportional data, there is nothing in the model to prevent the results from producing negative counts or proportions that are greater than 1 or less than 0.

Fortunately, GLMs have link functions that allow us to use non-continuous and dichotomous data such as counts and proportions. The logit link is one link function that works well with proportional data. It produces a logistic regression that forces the predictions to fall between 0 and 1. Logistic regression transforms nonlinear relationships into linear ones. It is particularly effective for describing the relationship between dichotomous, or binary, variables and a group of independent "predictor" variables (Meunard 2002; Pampel 2000). Unfortunately, the logit link assumes that the data have a binomial error distribution. A binomial error distribution assumes that each artifact within a sample was sampled randomly and independently of other artifacts. This is a problematic assumption to make with archaeological data. Most artifacts are portions of objects, such as pots. It is likely that pots were broken or discarded in a localized area. Contexts with several sherds of creamware, for example, are likely to have many more sherds of creamware, thereby creating a non-independent sample. Non-independent samples are easily remembered as "contagion" samples, where the likelihood of catching the flu is not independent since catching the flu relies on others in the sample having the same bug. Data that are not independently sampled likely contain what is known as extra-binomial variation, which means that the variance ( $\sigma^2$ ) of the real error distribution is much larger than the assumed binomial error.

GLMs have a log link function and error distributions that can better accommodate assemblage count data. The log link function predicts the log of the artifact count (e.g., the log of the number of refined ceramic sherds). Hence negative predictions are impossible. Poisson error distributions can be applied to count data that refer to knowable cases, such as the number of sherds in a context or the number of flu cases, but that have no information on how many times something did not happen. A binomial model, on the other hand, requires knowing both the number of times an incident occurs and the number of times it did not occur (Crawley 1993:227). Poisson distributions are, however, constrained in that they also assume independence within samples. The assumed Poisson error variance ( $\sigma^2$ ) is equal to the mean of the dependent variable, which does not allow for much variation in a sample.

The negative binomial error distribution has more forgiving requirements about variation. Unlike the Poisson error distribution, the negative binomial variance can be greater than the mean and it can be as large as necessary to account for lack of independence and the resulting extra-binomial variation within samples.

5. It has been argued that the explosion in the quantity of all classes of material culture on sites dating to the second half of the eighteenth century was the result of the increase in reasonably priced goods. While increasingly inexpensive items no doubt increased consumption and discard rates, the rapid spike in the consumption of costly items such as refined ceramics and buttons moved much faster than the decrease in prices. George Miller's price index, for example, suggests that prices for refined ceramics wares only began to drop substantially by the early nineteenth century (1988, 1990). Based on the temporal regressions, it is clear that slaves living in Virginia were acquiring and discarding costly items at rates that were well ahead of falling consumer prices.

6. This PCA uses the correlation matrix of the residuals from the GLMs. The first principal component should account for the greatest amount of variation, the second principal accounts for the next greatest amount of variation, and so forth. Together, the first and second principal components should account for at least 70 percent of the variation. In the PCA for Virginia sites, principal component 1 (PC1) accounts for 51 percent of the variation and PC2 accounts for 36 percent of the variation, together accounting for 87 percent of the variation in the data set. In the PCA of Jamaica sites, PC1 and PC2 account for 50 percent and 36 percent of the variation, respectively. These percentages meet the thresholds for each principal component as established by the broken stick rule (Legendere and Legendre 1998).

7. PCA transforms the residuals into a visual representation of the relationship between the data. For readers unfamiliar with reading PCA biplots, here is a quick tutorial. When looking at the biplot, select two eigenvectors whose relationship you wish to understand, such as metal buttons and refined ceramics. Starting at the 0/0 point on the biplot, draw a straight line from that point through the metal button data point, the first eigenvector. Draw a second line from the 0/0 point through the refined ceramic eigenvector. If the angle formed by these two lines is less than 90 degrees, this means that the data points are positively correlated. If the angle between the two vectors is greater than or equal to 90 degrees but less than 180 degrees, the data points are not correlated. If the vectors are more than 180 degrees apart, the data are negatively correlated.