

**PROCESSING FINE SCREEN SAMPLES FROM ARCHAEOLOGICAL SITES:
A CASE STUDY FROM THE SOUTH GROVE MIDDEN AT MOUNT VERNON
PLANTATION**

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ABSTRACT

The use of flotation and water screening over the past forty years has become widespread on archaeological sites, but since its initial adoption, there has been little study of increasing its cost-effectiveness or critically evaluating its productivity and results. The use of these fine screen recovery methods, and the subsequent sorting of the materials—though highly effective in retrieving small finds—can be a time consuming and costly endeavor. This study tests and recommends ways in which time (and therefore cost) can be reduced. We believe the implementation of research designs specific to fine screen materials to be the key to this reduction. Beads from Mount Vernon's South Grove Midden are used as a case study to show what can be gained archaeometrically and anthropologically through a carefully designed fine screen strategy.

INTRODUCTION

Archaeologists have long recognized the important contributions of small finds data to our understanding of past lifeways. We have our discipline's processual predecessors to thank for the initial realization that thousands of tiny pieces of data were slipping through the screen—data that could allow for more detailed reconstructions of diet, modes of personal adornment, household activities such as sewing, and other significant research questions (Struever 1968). By the early 1970s, water screening and flotation were widespread and commonly employed on archaeological sites across North America to retrieve small artifacts, bones, and botanical remains (Limp 1974). Early experimenters with these retrieval processes engineered flotation machinery, calculated processing times, evaluated effectiveness, and even took into account the costs of fuel and wages for the screen operators (Struever 1968; French 1971; Weaver 1971; Limp 1974; Minnis and LeBlanc 1976; see also Hirst 2012).

This article draws inspiration from these earlier methodological foundations in two important ways. First, it addresses the cost-side of this cost-benefit analysis by gaining a better understanding of the factors that affect the time and labor needed to retrieve artifactual material from processed soil samples. Secondly, it assesses the benefits of fine fraction analysis by using Mount Vernon's South Grove Midden bead assemblage as a case study. We hypothesize that this assemblage will not only increase in the number of individual specimens (NISP) present, but also become more diverse in terms of richness or the number of individual types recovered as finer retrieval methods are employed. As a result, by studying the economic considerations and archaeometric contributions of a systematic soil processing and picking regime that has been instituted for the analysis of the South Grove Midden at Mount Vernon, we can begin to explore some of the cultural questions that these small artifacts can help us answer.

HISTORIC BACKGROUND

Mount Vernon is a privately owned historic house museum with the mission to preserve the eighteenth-century home of George Washington and interpret the life of America's first president. The plantation is located on the Potomac River in Fairfax County, Virginia, and includes a historic core with Mansion house, outbuildings, and formal grounds. In 1990, during construction of an irrigation system, a surface midden was identified in the South Grove, located on the lawn south of the Mansion and kitchen. Under the direction of Dennis Pogue, Mount Vernon's Chief Archaeologist, the midden was uncovered and completely excavated between 1990 and 1994.

The midden measured 25 feet north–south by 20 feet east–west and up to 1.5 feet deep. It is interpreted as the repository for trash from the Mansion, kitchen, and dairy in the pre-Revolutionary War period. The earliest layers of the feature date from 1735, the year George Washington's father Augustine developed the property. The deposition of the feature layers continued to 1775, when a large brick drain was constructed through the midden. At this time, George Washington began reorganizing his landscape, transforming this work yard into a formal grove with flowering trees (Pogue *et al.* 2005; Breen 2006).

The excavation of the midden utilized several recovery methods. Twentieth-century soils and intrusions were dry screened through 3/8 inch mesh; nineteenth-century layers and the builder's trench for the brick drain were dry screened through 1/4 in. mesh; and 226 layers of soil from the pre-1775 midden contexts were water screened through 1/4 in. mesh and 1/16 in. mesh. As much as 10 liters of soil were sampled from each of the midden layers and processed using soil flotation. The heavy fraction remains from these flotation samples were combined with the water screened materials for processing. The material from the 1/16 in. screen, referred to as "fine screen," was sorted and processed at Mount Vernon and is the focus of this article. Together, these wet and dry screen retrieval methods yielded nearly 120,000 artifacts from the midden in addition to significant botanical and faunal assemblages. With this large and diverse assemblage, researchers have been able to examine these artifacts to answer numerous questions ranging from methodological to interpretive, with the overall goal of contributing to our understanding of George Washington and the broader plantation community who lived and worked at Mount Vernon.

LABORATORY PROCEDURES

The 226 fine screen samples taken from the pre-1775 layers of the South Grove Midden were recently sorted as part of Mount Vernon's Archaeological Collections Online Project, which is an initiative to systematically catalogue, analyze, and contextualize the South Grove Midden in a digital format for online use (Mount Vernon Archaeology Department 2012). Sorting these samples provided an opportunity to develop a fine screening research design, investigate the time involved to retrieve artifacts, faunal remains, and ecofacts from fine screen samples as well as study the benefits of retrieving artifacts from small fractions.

Sorting was conducted in the Mount Vernon archaeological laboratory and employed a methodology outlined in the *Mount Vernon Laboratory Manual* (Pogue *et al.* 2008) and Mount Vernon's "Short Guide to Picking Fine Screen Material" (Mount Vernon Archaeology Department 2010). Fine screen samples were divided using a geology screen into 1/8 in. and 1/16 in. fractions to facilitate picking, and different sorting protocols were employed for each fraction size. Once sorted, all artifacts were catalogued into the Digital Archaeological Archive of Comparative Slavery database (DAACS, www.daacs.org). Faunal remains are currently being catalogued and analyzed under the direction of the project zooarchaeologist Joanne Bowen, Colonial Williamsburg's Curator of Zooarchaeology; archaeobotanical remains were catalogued and analyzed by Justine McKnight (2012), Archaeobotanical Consultant.

The protocols for sorting fine screen materials at Mount Vernon generally vary slightly by site, based on the individual research design, artifact preservation, feature type, discussions with specialists, and time and cost considerations. Table 1 outlines the overall protocols employed for picking fine screen samples from the South Grove Midden. We treat this stage of the archaeological process almost like a re-excavation of the site in terms of developing a detailed research design for the purpose of retrieving the maximum number of artifacts possible in a cost-effective manner.

TABLE 1: MOUNT VERNON'S SORTING PROTOCOLS FOR 1/8 AND 1/16 INCH MATERIAL

Material	1/8 in	1/16 in
beads	collected	collected
eggshell	collected	collected
gun shot	collected	collected
iron artifacts (not corrosion)	collected	collected
non-charcoal botanicals	collected	collected
straight pins	collected	collected
thread	collected	collected
faunal	collected	collected only if whole
ceramics	collected	not collected
glass	collected	not collected
tobacco pipe	collected	not collected
architectural	not collected	not collected
charcoal	not collected	not collected
shell	not collected	not collected

The following categories of material were collected from both 1/8 in. and 1/16 in. fractions: beads; eggshell; shot; iron artifacts; botanicals; straight pins; and thread. Regardless of the size of the fractions, picking the samples for each of these types of material has the potential to more accurately reflect the activities that led to their use and disposal. In consultation with Bowen (personal communication 2010), the recommendation was followed to pick all faunal remains—regardless of completeness—at the 1/8 in. level, but to only pick complete bones (not including fish scales) at the 1/16 in. level. This methodology recognizes the diminishing returns that incomplete and unidentifiable bone fragments and fish scales have for dietary reconstructions at the 1/16 in. size. Similarly, we argue that a number of other artifacts—including ceramics, glass, tobacco pipes, architectural material (i.e., brick, mortar, and plaster), charcoal, and shell—have less ability to contribute taphonomically, archaeometrically, or anthropologically to the interpretation of plantation sites at the 1/16 in. as opposed to the 1/8 in. levels. Changes between 1/8 in. and 1/16 in. protocols for recovering materials enable researchers to cut down on time spent picking superfluous, redundant, or unidentifiable data. Finally, Mount Vernon has a policy to curate residual material that has been picked and sorted in the event that our protocols come into question in the future.

THE TIME STUDY

Sorting fine screen materials can pose a challenge for archaeologists given the limited time and resources available to complete a given project. Clearly defined research objectives and a standard set of sorting protocols are key to maximizing the data recovery. During the sorting of the fine screen samples, 11 proveniences were subjected to detailed analysis to track the time required to recover artifacts, ecofacts, and faunal remains (Table 2). Prior to sorting, each sample was weighed. To ensure consistency, the test samples were sorted by one of three individuals, all with previous sorting experience and a vested interest in the project. Sorting was undertaken in a well lit space using a magnifying glass and small paintbrush to view and separate the materials. The time required to sort specific materials from each sample was recorded in minutes, and after each sample was sorted, the bags of recovered artifacts were weighed to determine the amount of recovered materials.

Over a 3 month period, 26.5 man hours were expended to sort the 11 fine screen samples weighing a total of 7,482 grams or 16.5 pounds. While Table 2 reveals some unsurprising results (i.e., larger samples yielded more artifacts and took longer to process), we did, however, notice a pattern which supports our decision to implement a two-tiered sorting methodology (Table 3). This pattern emerged as we first calculated a richness ratio (or weight of artifacts recovered to total sample weight) to facilitate comparisons of artifacts recovered between proveniences by fraction size. Samples with a high richness

TABLE 2: SAMPLES SUBJECTED TO TIME STUDY WITH WEIGHTS OF TOTAL SAMPLE AND MATERIAL RECOVERED AND TIME

Provenience	Total Sample Weight (g)	Total Weight of Artifacts Recovered (g)	Sort Time (min)
328PPP	103.8	0.5	40
328HHH	169.3	9	60
328KKK	170.5	1.32	41
328WWW	181.9	1.2	9
328LLL	210.5	0.9	47
328RRR	248	14	63
328LL	667.3	58.4	307
328XX	743.9	17.2	209
328AA	969.8	13.9	134
328EE	1537	15.27	236
328MM	2470	103.98	447

TABLE 3: RICHNESS RATIOS AND SORT RATES CALCULATED FOR THE 1/8 AND 1/16 INCH SAMPLES

Provenience	Richness Ratio (1/8 in)	Sort Rate 1/8 (g per min)	Provenience	Richness Ratio (1/16 in)	Sort Rate 1/16 (g per min)
328WWW	0.79	9.07	328PPP	0	1.83
328PPP	0.81	3.62	328KKK	0	3.53
328LLL	0.94	8.53	328RRR	0	3.63
328KKK	1.54	5.05	328MM	0.04	10.82
328EE	1.73	5.85	328EE	0.06	7.61
328AA	1.79	7.44	328LL	0.06	13.28
328XX	4.46	2.34	328LLL	0.08	3.38
328RRR	9.34	4.16	328AA	0.1	6.57
328HHH	9.80	2.32	328XX	0.21	7.24
328MM	11.75	2.93	328WWW	0.59	5.92
328LL	16.23	1.27	328HHH	0.72	3.63
TOTAL		52.59	TOTAL		67.44

ratio for the 1/8 in. fraction include 328LL and 328MM, and for the 1/16 in. fraction include 328HHH and 328WWW. We then calculated a grams-per-minute sort rate to allow for time comparisons that were independent of the total sample weight.

For the 1/8 in. samples, there is a weak inverse relationship between the richness ratio and sort rate. In other words, the denser the sample is with artifacts, the longer the sample takes to process as reflected in a low grams-per-minute sort rate (see 328LL and 328MM). However, much variability exists within this data set. For example, 328PPP has a low richness ratio and, therefore, should have been processed quickly. The 1/16 in. samples show no recognizable relationship between richness ratio and sort rate, though since the range in the richness ratio is so minimal, it may be masking potential patterns. Factors that might account for these inconsistent or non-existent patterns include worker productivity and sample cleanliness as well as the fact that a larger data set of both 1/8 in. and 1/16 in. samples is needed to further explore these issues.

Notably, based on our findings, it is clear that shifting sorting protocols between 1/8 in. and 1/16 in. sample sizes did result in significant time and cost savings that did not affect the recovery rates of at least one important artifact type, as will be seen in the case study. Overall, it took almost 19 hours to sort the 1/8 in. samples and less than half that time (nearly 8 hours) for the 1/16 in. samples. These findings are

supported by comparing the sort rates for each size category. We were able to process 52.59 grams per minute of 1/8 in. material and 67.44 grams per minute for the 1/16 in. fractions (Table 3).

Though not captured mathematically, the human factor is also worth reporting. As we began the sorting process, many individuals (volunteers, student interns, and professional archaeologists) “tried out” for the role of sorting the fine screen samples. This exercise revealed that it was a challenge for some to remain focused for extended periods of time, and that with a loss of concentration came a decrease in overall artifact retrieval. Following a period of trial and error using a variety of different sorters, it became clear that it was more time and cost effective to enlist the help of a smaller, dedicated group. Previous laboratory experience, or even archaeological experience, was not a prerequisite for a good sorter. Regardless of their previous background, individuals with the patience and ability to consistently apply the sorting protocols for the duration of their time were more successful overall.

Our anecdotal experience is supported by evidence from two other archaeological sites: Franchthi Cave in Greece (Diamant 1979) and the Can Hasan Site in Turkey (French 1971). The supervisor of the Franchthi Cave site noted the benefits of employing a group of dedicated local villagers to sort the fine screen materials. They were familiar with the sorting process, since many of them were engaged in grain production where sieving and sorting cereals was common (Diamant 1979:215-216). Similarly, at the Can Hasan Site in Turkey, archaeologists hired local women to run the flotation system and sort the samples. French (1971:62) noted, “The mistake and loss-rate is probably very low, since the girls are used to sieving and sorting as a normal household task.”

In conclusion, throwing large numbers of individuals at a mound of fine screen sample bags without a carefully constructed and thoroughly conceived research design is not the quickest, most cost effective, or most productive way to accomplish sorting. Instead, choose your sorters creatively and wisely. Most importantly, spend time before sorting begins to consider the site along with its samples, artifact categories, and research questions in consultation with potential specialists. The time study portion of this project was an attempt to provide quantitative data to the subjective act of sorting fine screen samples. As expected, the methods used to collect, process, and sort samples add to the expense of site excavation and analysis. These costs, however, can be anticipated and estimated by employing a varied recovery scheme to ensure that lab time is spent recovering materials that can be identified and will contribute to the site’s research questions. The second component of this article is a systematic review of the recovery of one artifact type, beads, to test the success of this sorting strategy.

CASE STUDY: BEADS

The beads recovered from the South Grove Midden were chosen as a case study to assess the contribution that fine screening can make to a site’s artifact assemblage, especially in light of its relative cost and benefits. This case study includes all beads recovered from the entire site, except the obvious twentieth-century specimens in the uppermost layers of the excavation, which represent tourist debris. This case study includes layers that were processed using 3/8 in. dry screening; 1/4 in. dry screening and wet screening; and 1/8 in. and 1/16 in. mesh fine screening.

The beads from the South Grove are catalogued in DAACS utilizing Karklins (1985) glass bead classification scheme, which is based on Kidd and Kidd’s (1970) typology (Grillo and Aultman 2003). This analysis of beads is directed toward two outcomes. These outcomes include measuring the increase in NISP with the addition of specimens from the fine screen materials, and measuring the significance of this increase as calculated through the richness of the bead assemblage. For this study, the calculation of richness is based on bead type, with increased richness correlating to an increase in the number of unique types of beads recovered.

A total of 240 beads were recovered from the South Grove Midden excavations. All of these beads are made of glass with the exception of one, which may be made of stone, but needs further research to definitively identify its material type. However, for the purposes of this study, the bead was incorporated into the glass bead assemblage.

Of the 240 beads recovered from the South Grove Midden, 224 are complete and 16 are incomplete. Since 3 of the incomplete beads have enough measurable dimensions to be considered part of this study,

the South Grove Midden assemblage consists of 227 beads with sufficient measurements (length, width, and/or height). These beads allow us to determine if they would have been captured in one of three screen sizes: 1/4 in.; 1/8 in.; or 1/16 in.

Based upon Karklins' (1985) typology, there are eight types of beads present in the midden assemblage. Drawn beads are the dominant method of manufacture and non-tubular are the dominant shape. Table 4 presents the bead types and bead counts per type, with the majority of the bead assemblage (65%) belonging to one of two types: Type IIa and Type IIIa. Table 5 illustrates the NISP and richness recovered from the three screen sizes. As you can see, without fine screening, over half of the bead assemblage (62%, n=140) would have been lost. In the 1/4 in. mesh, 87 beads were recovered. When a 1/8 in. screen was utilized, the assemblage increased by 27.5 percent (n=33), and the assemblage increased by 47 percent (n=107) when the 1/16 in. mesh was used.

TABLE 4: MEASURABLE BEAD ASSEMBLAGE FROM THE SOUTH GROVE MIDDEN BY TYPE, COUNT, AND PERCENT

Bead Type	Bead Type Description	Count	Percent
Ia	Drawn-Singlelayered-Tubular	19	8%
Ic	Drawn-Singlelayered-Tubular-Hexagonal	10	4%
IIa	Drawn-Singlelayered-Nontubular	79	35%
IIIa	Drawn-Multilayered-Tubular	69	30%
IVa	Drawn-Multilayered-Nontubular	43	19%
IVb	Drawn-Multilayered-Nontubular-Adventitious	1	0%
Unid.	Unidentified	3	1%
WIa	Wound-Singlelayered	3	1%
	TOTAL	227	100%

TABLE 5: BEAD RETENTION AS MEASURABLE BY NISP AND RICHNESS FOR DIFFERENT SIZED SAMPLES

Screen Size	Cumulative Bead NISP	Kidd and Kidd Types								Cumulative Richness
1/4 in	87	Ia			IIIa	IVa	IVb	Unid.	WIa	6
1/8 in	120	Ia		IIa	IIIa	IVa		Unid.		7
1/16 in	227	Ia	Ic	IIa		IVa				8

These data raise the question, are we merely increasing our bead count, or are we discovering new types of beads that would have been missed if fine screening protocols were not in place? Table 5 shows that the cumulative richness measure increased by one type—from 6 to 7 and 7 to 8—as screens of increasing fineness were utilized. Therefore, we would have lost two unique types of beads (or one quarter of all bead types) were fine screening not employed. These types are IIa (drawn, simple, sub-spherical beads of multiple colors commonly referred to as seed or micro-beads) and Ic (drawn, simple, hexagonal, black beads that are also seed or micro in size) (see Figure 1). Certainly, increased sample size has implications for statistical analyses, but increased type counts can be even more significant, since these increases in artifact richness can contribute to cultural interpretations in ways that simple NISPs cannot.

DISCUSSION

Since the 1960s and 1970s, the literature on fine screening, its cost, its results, and its implications for a more nuanced methodological and theoretical approach to the archaeological record has dwindled. However, in light of continued reluctance on the part of some archaeologists to utilize these methods,



Figure 1. An example of a bead type (Ic) that would have been lost if not for fine screening.

studies are again focusing on the costs and benefits of fine screening. For example, Barbara Heath and Lori Lee's (2008) recent study examines the effects of soil processing methodologies on artifact recovery rates from subfloor pits at three slave quarter sites at Poplar Forest, Thomas Jefferson's retirement home in Bedford County, Virginia. While Heath and Lee (2008) describe three different soil processing regimes employed at three different slave quarter sites at Poplar Forest, their study also begins to link excavation strategy and the potential cultural meaning of some of these sub-assemblages of tiny data.

Interestingly, similar results were obtained at Poplar Forest as compared to our study of the South Grove Midden. While one of the Poplar Forest slave quarters (North Hill) yielded no beads from the fine screened subfloor pit feature, Heath and Lee found that at the Quarter Site and Site A, significant bead loss would have occurred without fine screening. Specifically, at the Quarter Site, two types of beads would have been lost, seed beads and pentagonal beads. At Site A, all of the site's 159 seed beads would have been lost. Just as these beads slip through the mesh, so too does our ability to understand what they represent in terms of labor, gender, consumerism, or identity. Heath and Lee (2008:11) suggest that the small size of these beads implies fine needlework and beadwork skills that they argue was the work of women, perhaps girls, with "nimble fingers and sharp eyes."

While the beads from these Poplar Forest assemblages are associated with slave-related subfloor pits, findings from a more mixed plantation midden context, such as the South Grove Midden, also raise the question, to whom did these beads belong? Certainly there is a vast body of evidence that beads were important to the enslaved community (e.g., Yentsch 1994; Stine *et al.* 1996; Heath 1999), but beadwork is also found adorning the clothing and accessories of free whites as well. Seed beads decorated waistcoats, pockets, purses, even the handles of knives and forks in eighteenth-century England and France (Victoria and Albert Museum 2012). Our ability to address cultural questions of gender and identity through the lens of bead research is greatly enhanced by a view of a more complete bead universe offered by a systematic fine screening program through 1/16 in. mesh.

CONCLUSION

By documenting and testing Mount Vernon's fine screening research design and protocols, we believe that we have provided a useful case study for how to accomplish this crucial task in a time and cost-effective manner. Part of the benefit of this study is a transparency of research design and picking protocols. Not every artifact, animal bone, fish scale, seed remain, or charred piece of wood needs to be retrieved from each screen size sample, as long as the underlying sorting rationale is defensible. However, some artifact categories, such as beads, do warrant complete retrieval, since the increase in both the number individual artifact specimens and artifact richness contributes to our greater goals of understanding the past. In the future, and in the footsteps of our processual predecessors, we plan to continue to develop, test, and make available studies of this nature with the perceived benefits to our banks—monetarily and culturally.

REFERENCES CITED

- Breen, Eleanor E.
2006 Home is Where the Trash Is: Excavating the Early Households of Mount Vernon. *Quarterly Bulletin of the Archeological Society of Virginia* 61(4):186-196.
- Diamant, Steven
1979 A Short History of Archaeological Sieving at Franchthi Cave, Greece. *Journal of Field Archaeology* 6(2):203-217.
- French, D. H.
1971 An Experiment in Water-Sieving. *Anatolian Studies* 21:59-64.
- Grillo, Kate and Jennifer Aultman
2003 DAACS Cataloguing Manual: Beads. Electronic document, <http://www.daacs.org/wp-content/uploads/beads.pdf>. Accessed April 24, 2012.
- Heath, Barbara J.
1999 Buttons, Beads, and Buckles: Contextualizing Adornment Within the Bounds of Slavery. In *Historical Archaeology, Identity Formation, and the Interpretation of Ethnicity*, edited by Maria Franklin and Garrett Fesler, pp. 47-70. Colonial Williamsburg Research Publications. Dietz Press, Richmond.
- Heath, Barbara and Lori Lee
2008 The Smallest Things Forgotten: Comparative Analyses of Three Subfloor Pit Assemblages at Poplar Forest. Paper presented 41st Annual Meeting of the Society for Historic Archaeology, Albuquerque, NM.
- Hirst, K. Kris
2012 Flotation Method in Archaeology: A Brief Bibliography on the Flotation Method. Electronic document, http://archaeology.about.com/od/floralstudies/qt/flotation_bib.htm. Accessed April 24, 2012.
- Karklins, Karlis
1985 *Glass Beads: The Levin Catalogue of Mid-19th Century Beads, A sample Book of 19th Century Venetian Beads, Guide to the Description and Classification of Glass Beads*. Parks Canada, National Historic Parks and Sites Branch, Environment Canada, Ottawa.
- Kidd, Kenneth E. and Martha A. Kidd
1970 A Classification System for Glass Beads for the Use of Field Archaeologists. *Canadian Historic Sites: Occasional Papers in Archaeology and History* 1:45-89.
- Limp, W. Fredrick
1974 Water Separation and Flotation Processes. *Journal of Field Archaeology* 1(3-4):337-342.
- McKnight, Justine Woodward
2012 *Report on the Analysis of Flotation and Waterscreen-recovered Archeobotanical Remains from the South Grove Midden, Mount Vernon, 44FX762/17: Cumulative Results of the 2011-2012 Laboratory Research Effort*. Submitted to the Mount Vernon Ladies' Association. Copies available from Mount Vernon Archaeology, Mount Vernon, VA.
- Minnis, Paul E. and Steven A. LeBlanc
1976 An Efficient, Inexpensive Arid Lands Flotation System. *American Antiquity* 41(4):491-493.
- Mount Vernon Archaeology Department
2010 Short Guide to Laboratory Procedures: Picking Fine Screen Material. Manuscript on file, Mount Vernon Archaeology Department, Mount Vernon, VA.
2012 Mount Vernon's Midden. Electronic document, <http://mountvernonmidden.org/>. Accessed April 19, 2012.
- Pogue, Dennis J., Esther C. White, and Eleanor E. Breen
2005 Digging for Trash and Finding Treasure at Mount Vernon. *The Magazine Antiques* CLXVIII(3):88-95.

- Pogue, Dennis J., Judith D. Jobrack, Esther White, Eleanor Breen, Curt Breckenridge, and Christy Leeson
2008 *Field and Laboratory Procedures Manual*. Manuscript on file, Mount Vernon Archaeology Department, Mount Vernon, VA.
- Stine, Linda France, Melanie A. Cabak and Mark D. Groover
1996 Blue Beads as African-American Cultural Symbols. *Historical Archaeology* 30(3):49-75.
- Struever, Stuart
1968 Flotation Techniques for the Recovery of Small-Scale Archaeological Remains. *American Antiquity* 33:353-362
- Victoria and Albert Museum
2012 Collections Search: "Bead." Electronic resource, <http://collections.vam.ac.uk/>. Accessed April 24, 2012.
- Weaver, M. E.
1971 A New Water Separation Process for Soil from Archaeological Excavations. *Anatolian Studies* 21:65-68.
- Yentsch, Anne
1994 *A Chesapeake Family and Their Slaves*. Cambridge University Press, New York.