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Alternative Ways of Measuring Artifacts Used in the Preliminary Analysis of the Calvert Site

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As I read recent articles, it is readily apparent that historical archaeologists in the Mid-Atlantic region are doing more sophisticated analyses (King, Miller, Custer, etc.). At the same time, urban archaeologists in particular have become concerned "with the interpretation of the artifacts they dig up and some are disappointed. Citing such individuals, Marley Brown suggests it is now time to "confront head-on the issue of what to do with artifacts" (Brown 1987). While I sympathize, my problem is not the issue of scale nor the lack of alternative analyatical techniques. Also, I do not view the analysis I am going to discuss today as "escapism" or an "avoidance strategy". But I would like to convince some of you to present to supplement the reporting methods now used because this would give all of us a larger and more useful data base to draw upon.

We all know the archaeological record is a by-product of cultural activity and of natural processes and that, in order to identify and study the cultural activity, one must also be able to identify and evaluate the distortion created by the natural environment--i.e., to know with a fair degree of skill what effects site formation processes

have had upon the deposits one analyzes. Yet, while well aware of this problem, almost none of us "historical types" are even semi-skilled at doing this. If we were, there would be a body of literature discussing the ways in which site formation proceses affect artifact assemblages with specific reference to historic sites.

To be truthful, I find the study of formation processes tedious, but formation processes have had an inescapably significant impact on the materials recovered from the Calvert Site and are a major reason for the variety and quantitative richness of its deposits.

The richness of the site does not result simply from the fact that Governors Benedict and Charles Calvert and the latter's immediate descendents were wealthy individuals, members (legtimate and illegtimate) of the British nobility who possessed extraordinary political power in the Province of Maryland and hence had access to material goods above and beyond the quality and quantity normally found in other Maryland homes. To be sure, one has only to point to the quality of the ceramic vessels from the site to indicate the family's wealth and their use of food rituals in social display. Of 800 vessels identified thus far, more than 25% are Chinese porcelain, another ___ % are delft and another __% are creamware (deposited at a time the when this was a luxurious ware and not commonly available). Less than ___% are what one might term utilitarian vessels and this percentage decreases in the earliest deposits associated with the two governors.

The ceramic component of the assemblage at this site is important also because its characteristics provide one means to measure deposition and redeposition independent of other measures. Over time, ceramics in the Chesapeake climite suffer less damage in the ground than many other classes of artifacts unless they are subjected to trampling (as occurs in sheet refuse) and/or redeposition. Their analysis illustrates the basic similiarity in discard rates for various vessel forms and ware types from the three major deposits and, by extension, indicates ways in which these deposits are alike. For example, when analyzed by functional catagories of use (i.e., food preparation and storage, food distribution, food consumption, beverage distribution, etc.), there is only a few percentage points variation in terms of what was found in the dry deposit, the wet deposit, and the "open" deposit. There is internal consistency rather than variability among the ceramic components of these three deposits which throws into sharp relief the ways in which these deposits differ.

Still, it has been our belief since we started work at the site that its importance lies in the variety of materials from the three different deposits. I would like to review these features for you in terms of the natural processes that affected their contents and also briefly describe what was found using both a percentage measurement (as in the Carolina Artifact Pattern) and artifact density ratios. The artifact density

ratio simply measures the number of elements in any given artifact class on a volume basis. The volume is derived by multiplying the width and length of a feature by its depth and is presented here in terms of cubic feet. Such a measurement is particularly useful in comparing the contents of different features in terms of discard rates.

First, there is the "open context" represented at the site by a thick layer of refuse laid down over a brick paved courtyard between the house and well as the kitchen yard was moved to a new location away from State Circle. 'Open' is a term distinguishing sub-surface sites exposed to the weather from cave-fill and wet matrices (these deposits are not 'open' in the sense that an excavation unit is 'open'). This type of context is the one most frequently encountered at historical sites. The process of weathering affects the contents (for example, in New England the heavy frost causes pottery to "spall" thereby creating new, smaller sherds from larger sherds already in the ground). There is also more opportunity for attrition due to animal activity in an open deposit (taphonomists always cite the damage dogs can do) and opportunity for intrusive materials to enter an artifact assemblage. In well aerated acetic soils, there is considerable leaching and a corresponding loss in organic materials.

The "open" context provides the artifact base from which we draw most of our conclusions about prior lifeways. These conclusions are drawn based

on what is missing as well as what is present in an artifact assemblage. So, the fact that site formation processes subtract materials from "open" contexts can't be overlooked in the interpretation of archaeolaogical materials. This is self-evident when bone is discussed, but one should not overlook the importance the type of context can have on the size, shape, and number of ceramic sherds because this has an effect on (1) the number of sherds used to derive the mean ceramic date; (2) the identification of vessel forms; and (3) the estimation of minimum vessel counts. I think one of the best ways to grasp what happens to objects in the open context during their "life-in-the-ground" is to compare a typical assemblage from an open deposit with ones from wet or dry deposits.

Preliminary observations of the open deposit at the Calvert Site reveal that while it has a large faunal component (5,000 elements), the density of the bone material is 12.5/cubic foot compared to an average density of 34/cubic foot--three times more--in the dry deposit. Other organic materials (excluding oyster shell) inclulded four pieces of wood or less than .001% . With respect to the contents of the neaby well, The amount of beverage-related glass recovered was 4% less; the amount of ceramic material was 4% more. Nail frequencies varied by 2%. Miscellaneous inorganic materials comprised only 5% of the assemblage from the kitchen yard deposit.

Architectural materials, in addition to bone, represented the major artifact class--a 1,000 nails, over 2,000 pieces of window glass, hinges, lead window cames, and roofing tiles were among these. This is what one would expect in a deposit that was formed during rennovation of the house. There were also kitchen utensils and the sort of things one loses accidentally--slate markers, buttons, buckles, coins, hooks, eyes, and gun flints. There were occasional lenses of the sterile red sand brought in to fill the well and the garden wall builder's trench. The deposit was sealed by a thick layer of brick rubble. There was no indication that any fill was brought from off-site except for the sand lens noted above.

This "open" deposit was formed at the same time the well - which represents the "wet"context - was filled. The wide, brick well was built in the early eighteenth century, repaired and cleaned in the 1750s, when a thick layer of sterile sand was placed at its base. A coin dropped afterward, dated 1752, provided one TPQ. The next 12 feet were filled with alternating layers of domestic refuse, twigs and branches, brick rubble, building stone, and other architectural debris. Included in these well packed layers were the well hook and wooden bucket. The wet, anaerobic environment protected the gold gilded knee buckles, children's leather shoes, and other personal items that were disposed of within it as well as seeds, peach pits, and pine cones. As a result, the raw

numbers of preserved organic materials increased. Instead of 4 pieces of wood, there were a number of wooden objects--a broom, a plumb bob, a barrel, a mallet, etc.--and so many twigs and branches we only took a sample.

The next 10 feet were comprised of sand with occasional, small lenses of refuse. The sand layer was capped by a dark loamy deposit containing material that cross-mended with artifacts from the lower depths of the well. As the material in the lower sections of the well compacted from the pressure above, a slump developed that was filled later and it is in these upper sections that we found a small amount of Chinese motif pearlware and military items. A Virginia half-penny provides a TPQ of _____ for the well while the absence of pearlware motifs characteristic of the period 1785-1800 provides another bracketing date.

Benedict Calvert had Loyalist sympathies which is a major reason why he did not live in Annapolis--the nation's capital, occupied by military forces--during the War years. In the lower reaches of the well, we found almost all the pieces to a delft punch bowl inscribed "Success to the British Navy". Perhaps Benedict Calvert tossed it away before he left; perhaps someone else did.

Preliminary analysis indicates artifact density of faunal material in the well (excluding the sterile sand layer) was approximately 21

elements/cubic foot while the density of the ceramic component was 9 sherds/cubic foot. In the adjacent "open" deposit, the faunal rate dropped to 12.5/cubic foot, while the ceramic component was 8 sherds/cubic foot. Please note that this way of measuring the quantity of artifacts shows them in a much different light than do artifact counts. The bone count for the well was 4,465; the bone count for the kitchen deposit was 5,630. These latter figures suggest higher concentrations of bone in the "open" kitchen deposit. When viewed as a percentage of the whole for each feature, one can see the increase in bone (42% vs 35%), but the difference is most visible in density ratio.

We assume that the initial discard rate was similar for both these deposits. This seems reasonable given that each was close to the house and they existed in close relationship to one another--kitchen courtyard and kitchen well as part of one functional activity area. The ceramic density rates are extremely close and one would expect the bone density ratios to correspond more closely than they do if cultural factors alone were responsible. The observed variation in large part demonstrates the better preservation a wet matrix provides.

With this in mind, I would like to describe the third major deposit at the site. This deposit was formed when an orangery, heated by a dry-air brick heating system known as a hypocaust, was demolised and an addition was constructed. The addition covered the deposit, keeping its contents

dry and in an environment that was both warmer in winter and cooler in summer than the artifact deposits in the yard. Simply put, the materials deposited in the foundation of the heating system, and deposited over its surrounding yard area were stored as one might store goods in a dry basement or in a cave. The subterranean portions of the addition's foundation and the natural slope of the site kept the crawlspace sealed, protected, and moisture free.

There was minor disturbance of this deposit from time to time as floorboards were repaired and a new basement was built. Also, very small items such as tiny pins, buttons and possibly little broken pieces of broken dishes fell through the floorboards and were added to it. While the four surrounding brick walls protected it from large animals, rats and possibly squirrels used it as a home. This deposit was excavated in three layers--the "A" or surface layer; the "B" layer beginning at 3" and extending to the base (a depth that varied from 6" - 9"); and the fill inside the hypocaust foundation (extending to a depth of 18").

It is possible that this deposit took longer to form than did the other two deposits, although there is no stratigraphic evidence to suggest this and none that would indicate it was ever open to the sky--there are no wash layers of soil such as exposure to rain would create. It contained the same red brown loam that was found in the kitchen area and elsewhere in the yard, but it was also more "private" or isolated than

the kitchen courtyard and well which were next to State Circle. Because it has an excellent preservational context, this dry, powdery deposit contained quantities of small bone and wood fragments and other organic materials.

The ratio of ceramic sherds to bone fragments is similar in each layer (5-7% of the total assemblage); the ceramic density varies from 4 sherds/cubic foot in the "B" layer to 6 sherds/cubic foot in the hypocaust foundation and 7 sherds/cubic foot in the "A" layer. In terms of the minimum vessel count and the representation of vessel forms and ware types, the deposit is similar to the other two deposits. The slightly lower discard rate for ceramics (an average of 6 as opposed to 8 in the kitchen deposit and 9 in the well) may reflect the feature's greater distance from the kitchen activity area.

The artifact density of the bone in the base of the hypocaust was 19 elements/cubic foot which is very close to the ratio of bone in the well. The density rises to 35/cubic foot in the "B" layer and to 59/cubic foot in the "A" layer. These measurements suggest that preservational qualities were best in the surface layers which were extremely powdery and light whereas the brick rubble that lay below the surface exerted some compactive pressure on lower layers and also prevented air circulation from reaching these layers. Further evidence of the higher preservation in the "A" layer can be seen in the higher

proportion of nails (8.45% vs. 6.5% in the base) and in the increase in miscellaneous metals (7.92% vs. 3.78% in the base) and other organic materials (12.93% vs. 3.93%). The percentage of miscellaneous metals is twice that found in the open deposit or the well; the percentage of other organic materials increased dramatically.

At this point, we are extremely curious to know how the faunal assemblages, once the bone is identified, will vary between the three deposits (this work is being done by Betsy Reitz at the University of Georgia with funding provided by the National Endowment for the Humanities). We already know that the organic materials which were preserved in the well were leather (and the twigs and branches); there were no twigs and branches in the dry deposit which probably reflects a different discard pattern and is not related to preservation. However, there was some very dry, brittle leather and I suspect more leather was in the deposit originally. Whereas we got wooden tools and some furniture from the well, most of the wood in the dry deposit is the debitage from construction.

This deposit also contains small knitted and crocheted fragments, yarn, linen cloth, thread, and silk fabric. Clothing related objects abound: small, brass sequins, hooks and eyes, studs, cloth buttons, brass, pewter, and gold-washed buttons. There are also children's toys: small wooden animals, blocks, and gaming pieces. But there is not the variety

of iron tools and large iron implements found in the well--again, one assumes some variation in discard rates between the two trash deposits related to the use of objects in nearby activity areas. It is almost as though someone cleaned up the house and deposited the litter in the orangery remains and as though someone cleaned up the work area of the kitchen/farm yard and deposited it in the well and/or in the yard itself.

What is the best way to describe the deposits so that one can see (a) the effects of site formation processes and (b) also delineate the cultural activity that created them? Raw counts do not suffice. Nor, although I have used in my analysis, are percentages sufficient. They are really only one measuring device and insufficient by themselves. Looking at the different deposits, comparing one against the other while keeping in mind the different preservational contexts that existed, I realized that only in dramatic cases could one easily see differences when one compared assemblages using percentages derived from raw artifact counts. The increase in the variety of artifacts, especially in the various metals, but also in textiles, paper, and other plant remains decreased the percentages of ceramics and faunal materials that were seen in the orangery deposit. On the other hand, a bell jar deposit at the site stood out because 75% of its artifacts were the remains of glass bell jars (used to protect plants from the cold during the early

spring) and no other feature on the site had as high a glass content. One planting bed with an artifact content of 52% oyster (when the norm was between 5 and 10%) also stood out.

Percentage variation within a set range of artifact classes is what the Carolina Artifact pattern is based upon and it is this formula that is most frequently used to analyze artifacts. Yet the information presented in this manner is not equivalent to that presented by the measurement of artifact density per class per cubic foot. Each highlights different aspects of the assemblage and, in my opinion, artifact density ratios probably tell more about discard behavior than do the percentages. For example, the three deposits described above are not similar to the early eighteenth century deposits at the site. The latter were formed when Governor Charles Calvert tore down a posthole building, built his orangery, the well, paved the kitchen courtyard, and made other rennovations to the main house. This was probably done in 1727/28 just prior to the arrival of Governor Benedict Calvert (a younger son of Lord Baltimore) and his brother, Edward Henry Calvert who made their home in this dwelling. The bases of the original postholes were left intact (these contained almost no artifacts), but the disturbed postmolds left when the posts were uprooted and the disturbed upper portions of the postholes were filled with domestic refuse, oyster shell, and some building materials. The ratio of bone to ceramics in these features is

higher than in the later eighteenth century deposits reflecting, to some extent, the increased number of ceramic dining utensils owned by the average household by mid-century.

The relative importance of bone in these features, however, is masked when one compares them in terms of the percentage bone forms of the entire assemblage. The postholes located beneath the orangery and, later, beneath the addition have higher percentages of faunal remains than do others elsewhere on the site. But the number of elements pales in comparison to the counts for the large late eighteenth century deposits. However, when looked at in terms of density ratios the postholes show a deposition rate that is 2 to 3 times more than that found in the "A" layer of the orangery yard and more than 10 times higher than that for the kitchen yard.

Because there is always the possibility at an urban site that the household occuping the site did not produce the material found, and that off-site sources may be equally responsible for the contents of a feature, I would like to know about the quantities of faunal and ceramic remains found on rural sites. Specifically, I would like to know what the discard rates were on a volume basis. If rural people deposit bone or ceramics into postholes or cellars at the same rate as town dwellers, then we might begin to assume that neighbors did not take their garbage onto someone else's lot to dispose of it. If rural people deposit bone

or ceramics at a lower rate over equivalent time periods, then one would have to assume both on-site and off-site sources for the materials found at urban locales.

The preliminary results of the measurements of the bone density ratios over time at the Calvert Site are thought provoking. In the early eighteenth century, these range from highs of 155 and 144 per cubic foot to _____and to _____ at the lower end of the range. This represents a considerably higher deposition rate for bone than is found in the later features. It is possible that the volume of bone deposited per cubic foot is related in some way to the size of the feature that is being filled. Two bucketfuls of garbage in a cellar foundation and in a posthole will produce the same quantity of material, but different density measurements (assuming only these two bucketfuls are deposited). And the comparision being made with the data from the Calvert Site is not between features of equal size for different time periods, but for features of different size (the archaeological record not always being what we wish it would and could be if it were created in the laboratory).

Sherd size and indices of vessel completeness are other ways of measuring the amount of disturbance, the liklihood of redeposition and/or transport of materials to a site. Pat Garrow and Terry Klein have

prepared indices of vessel completeness, although I do not know the method they used. We have compared the average weights of various ceramic types from different contexts--from sheet refuse and from primary deposits like the well--as an index to sherd size. We are also using weight as an index of vessel completeness and will use the weight of whole vessels from museum collections as the norm against which we plot the weight of individual vessels identified from the site. In both cases, our primary assumption (drawing on Binford's discussions of the "schlep" factor) is that the larger the sherd size or the more whole the vessel, the less likely it is that the sherd/vessel was transported any significant distance before deposition.

We are using these methods because we feel it is necessary to separate the effects of site formation processes and to establish whether or not the Calvert artifact collection represents the objects discarded from the Calvert household (and not the neighborhood) before we consider the question of change over time in the use of material objects by the Calvert family. We have decided to do them "after-the-fact" and there is no doubt but what slight changes in our field and laboratory procedures woudl have made this task easier. Many materials, for example, could better be weighed in the field than in the lab. These measurements are not difficult measurements to make--they would, however, be more useful

if there was a larger body of comparative information against which our results could be projected.

At present, artifact analysis is often kept separate from analysis of the site per se. In terms of funding, this separation permits one to lower the cost of analysis. In terms of scheduling, it may advance field report preparation, because it separates field and laboratory activities rather than making them interdependent. All of this probably has some advantages, but if it is also the cause for the type of general discontent and "ferment" reported by Marley Brown in the most recent SHA newsletter, then change is in order (Brown 1987). The addition of different types of measurements to the standard routine of washing, labeling, and counting could make a great difference in what one can learn about a site from its artifacts. Personally, I view the trend to increase the scale of analysis from the household to the neighborhood level, to the regional level, and to larger levels as being as "escapist" as Brown suggests the focus on site formation process is. And I wonder if there aren't a whole variety of alternative approaches, different ways of measuring artifacts, that could first be put to good use undertaking larger-scale interpretations.

References and Footnotes

Brown, Marley III. 1987. Opinion 2 - A Rejoinder (to Mary Beaudry's Opinion). Society for Historical Archaeology Newsletter Volume 20(1), March 1987, pp. 25-27.

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