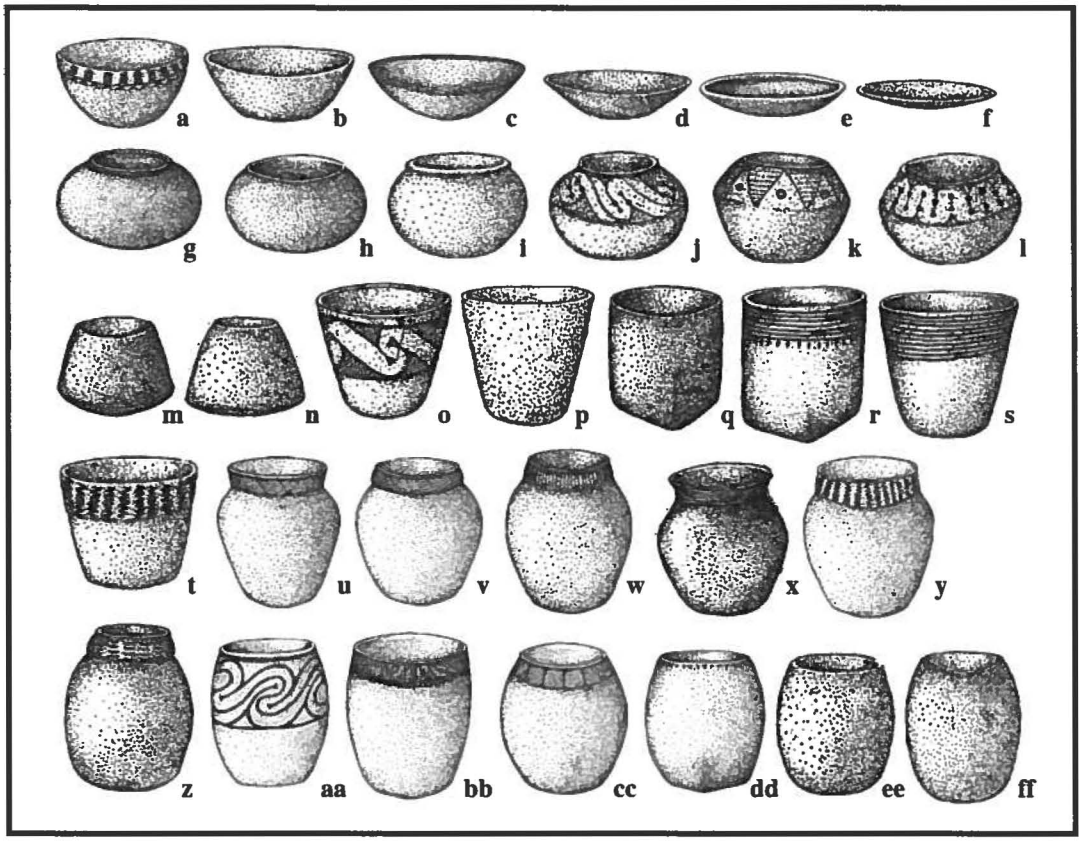
MISSISSIPPI ARCHAEOLOGY



Volume 50, Numbers 1 and 2
Summer and Winter 2015

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Volume 50, Numbers 1 & 2

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Getting Vessels from Sherds: The Utility of Archaeologial Illustrations in Reconstructing Asssemblages

Megan C. Kassabaum

Ceramic data and radiocarbon dates from two Coles Creek mound centers in the lower Yazoo Basin, Mississippi, are used to modify the chronology of the local Coles Creek–period sequence, which assists our efforts in understanding the Coles Creek-to-Mississippian transition ca. AD 1200.

Introduction

Once ceramic vessels began being produced, sherds quickly became one of the most common artifact types on archaeological sites. On late prehistoric sites in the American South, they are an abundant and informative artifact class. Stylistic analysis of ceramic assemblages is generally used to establish relative chronologies, identify the presence or absence of archaeological cultures at given locations, or identify interregional trade. Functional analysis, on the other hand, relies on vessel shape and size to reveal information about vessel function, which in turn helps to determine site function (Braun 1980; Hally 1986; Henrickson and McDonald 1983; Rice 1987; Shepard 1956; Smith 1988). In the Southeast, functional analyses have been used to investigate the nature of domestic and nondomestic assemblages and associated subsistence systems (Boudreaux 2007; 2010; Hally 1983a; 1983b; 1984; 1986; Hunter et al. 1995; Kassabaum 2014; Pauketat 1987; Roe 2010; Wilson and Rodning 2002), the length, permanence, and density of site occupations (Pauketat 1989; Shapiro 1984), differences in ceramic production and use across space (Blitz 1993; Boudreaux 2007; 2010; Johnson 2003; Kassabaum 2014; Roe 2010; Welch and Scarry 1995; Wells 1998; Wilson 1999), and changes in ceramic production and use through time (Braun 1983; Jones 1996; Kassabaum 2014; Lee et al. 1997; Ryan 2004; Sassaman 1993; 2002; Wells 1998; Wilson 1999). Functional analyses often rely on collections of whole (or nearly whole) pots from a given site to identify shape classes (Boudreaux 2010; Childress 1992; Hally 1983a; Pauketat 1987) and on ethnographic data or intuitive reasoning to assign specific functions to these classes (Braun 1980; DeBoer 1974; Hally 1983a; 1986; Henrickson and McDonald 1983; Shepard 1956). However, whole pots are rarely found on archaeological sites in the American South, especially when burial contexts are avoided.

This article reports on a project undertaken to identify and standardize vessel shape classes that could be appropriately used in functional analyses of ceramics from Coles Creek–era (ca. AD 750–1200) sites in the Lower Mississippi Valley. Drawing on published illustrations of whole and reconstructed pots, I utilize a series of ratios to identify common vessel forms, record and quantify the variation between them, and consider potential functional categories that correlate with shape categories. I then explore the archaeological utility of these forms by applying them to the analysis of a fragmentary collection from Feltus (22JE500), a Coles Creek–era mound site in Jefferson County, Mississippi. My goal is to create a well-defined series of vessel forms that can be used by Coles Creek scholars to standardize the language used in reporting on excavated assemblages, thus improving our ability to conduct comparative work.

Establishing Shape Categories

To provide a model assemblage from which to build my understanding of the range of variation in Coles Creek vessel form, I rely primarily on Ford's (1951) landmark study of the ceramics from the Greenhouse site (16AV2) in Avoyelles Parish, Louisiana. This collection, excavated in the 1930s, was utilized heavily in establishing a ceramic chronology for the late prehistoric Lower Mississippi Valley. More importantly for my purposes, Ford's study included drawings of reconstructed vessel forms. While these drawings are artists' renditions of whole vessels based upon fragmentary material (Ford 1951:48), the scope of excavation at Greenhouse and

level of vessel reconstruction allowed for more accurate estimations of vessel shape than is possible at Feltus (or other recently excavated Coles Creek sites). Though not as numerous, I have also included the illustrations of whole and reconstructed vessels from Phillips' (1970) *Archaeological Survey in the Lower Yazoo Basin*. Limiting my data set to Coles Creek pots that were drawn as complete vessels, I was able to amass 97 illustrations. To my knowledge, these are the only images of whole Coles Creek vessels in existence.

I identified six basic vessel shapes that allowed for the classification of all 97 illustrations through visual examination of contour and proportion: bowls, restricted bowls, pyramidal beakers, beakers, necked jars, and restricted jars (Figure 1). Though not drawn as complete vessels, and thus not included in this study, Ford (1951:108-110) does illustrate and discuss six fragments of clay pipes, suggesting that pipes should be included as a seventh basic vessel shape. In general, these categories fit well with those identified by other scholars working with Coles Creek assemblages. I then defined these categories based on a number of shape characteristics such as the number of inflection points (IP), corner points (CP), and points of vertical tangency (VT) along the vessel contour as defined by Shepard (1956:226). Additionally, I recorded the location of the widest and narrowest points on the vessel. Their definitions are as follows: Bowls (n = 24): no IP, CP, or VT; widest point at the rim and narrowest point at the base. Restricted bowls (n = 14): zero or one IP or CP (depending on the degree of neck/shoulder elaboration) and one VT; widest point at or above the midline and narrowest point at the base. Pyramidal beakers (n = 2): no IP, CP, or VT; widest point at the base and narrowest point at the rim. Beakers[1] (n = 16): no IP, CP, or VT; widest point at the rim and narrowest point at the base. Necked jars (n = 25): presence of a neck[2] and one or two VT (at the widest point on the body and often at the narrowest point on the neck); widest point near the midline and narrowest point at the rim, base, or neck. Restricted jars[3] (n = 16): no IP or CP and one VT; widest point at or above the midline and narrowest point at either the rim or the base.

I prioritized the criteria most important to characterizing different forms by emphasizing characteristics that were exclusive to a small number of vessel forms and/or likely to be functionally significant. As pipes are defined primarily by their small rim diameter and compound vessel form (either elbow-shaped or platform-shaped), they are not included in the definitions above. In creating these definitions, I ignored two readily identifiable secondary shape characteristics because they could be added or removed from any of the categories without significantly changing the utility of that vessel. The first is the presence of a carina on the vessel. A carina is defined as a "sharp angular turn in the vessel profile" (Sinopoli 1991:227) and occurs most commonly on bowls in this data set (Figure 2). The second and more common secondary shape characteristic is the addition of lugs, or flattened, sometimes decorated protuberances, to the rim of the vessel. Lugs appear on bowls, beakers, necked jars, and restricted jars and occur in two distinct styles—what Belmont (1983) refers to as Jackson and Joffrion lugs (Figure 3). These secondary characteristics did not play a role in the definition of my shape categories but their presence may alter the definitions above. They also may suggest certain functional attributes of the pots on which they exist, such as ease of being picked up or carried or ease of covering (Braun 1980:173; Henrickson and McDonald 1983).

Quantifying Variation in Shape Categories

Visual evaluation of vessel shapes can differ widely based on optical illusions caused by differences in vessel contour (Shepard 1956:240-243, 248). Thus, my next step was to see if quantitative measurements and exploratory data analysis would support the visual identifications discussed above. Quantitative analyses have been applied infrequently to functional analyses of Southeastern ceramics (Cruciotti et al. 2006:78; Hunter et al. 1995:172), and quantitative studies generally focus on vessel size rather than vessel shape. That said, a small number of analyses have shown the benefit of quantifying differences in vessel shape, and this article builds on those studies (Boudreaux 2010; Childress 1992; Cruciotti et al. 2006; Pauketat 1987; Sassaman 1993).

Using calipers and enlarged versions of the published drawings, I took six measurements in millimeters at characteristic points along each vessel contour to facilitate looking at relative proportions (Table 1). Using

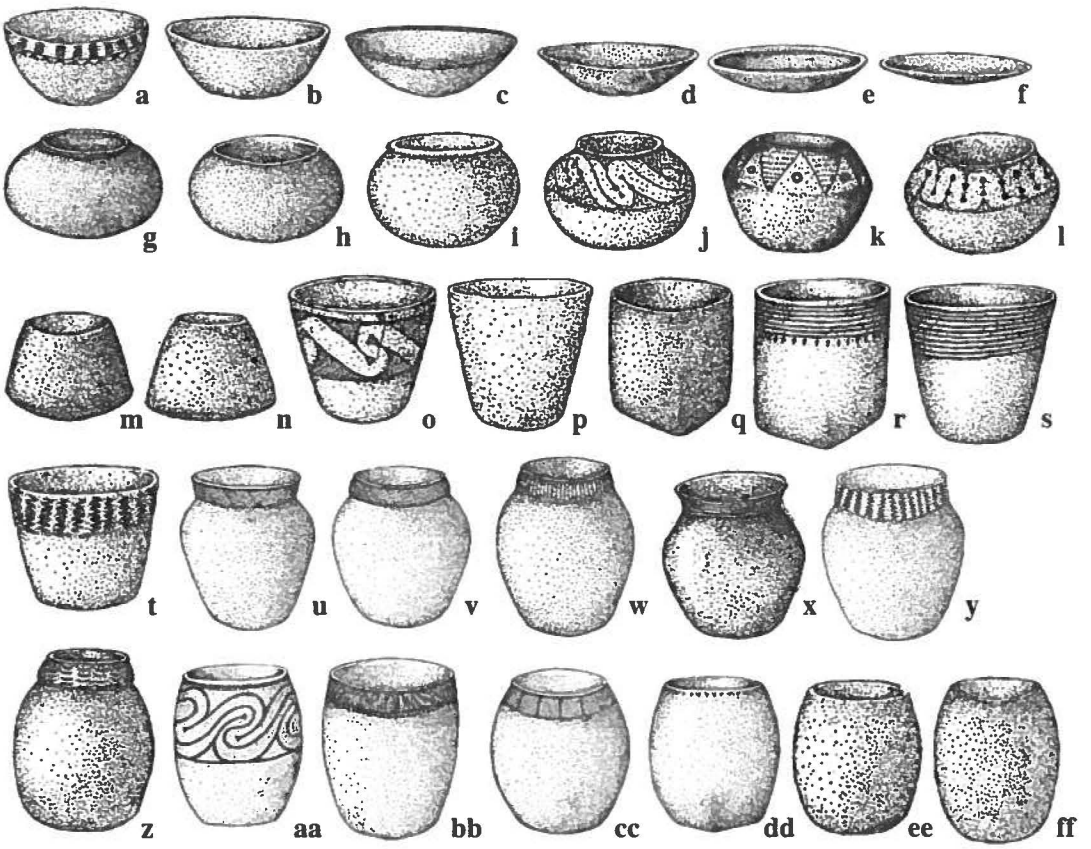

Figure 1. Examples of Coles Creek vessel shape categories: (a-f) bowls, (g-l) restricted bowls, (m-n) pyramidal beakers, (o-t) beakers, (u-z) necked jars, (aa-ff) restricted jars (adapted from Ford [1951]).

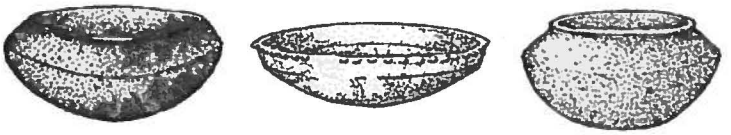

Figure 2. Examples of carinas on bowls (adapted from Ford [1951]).

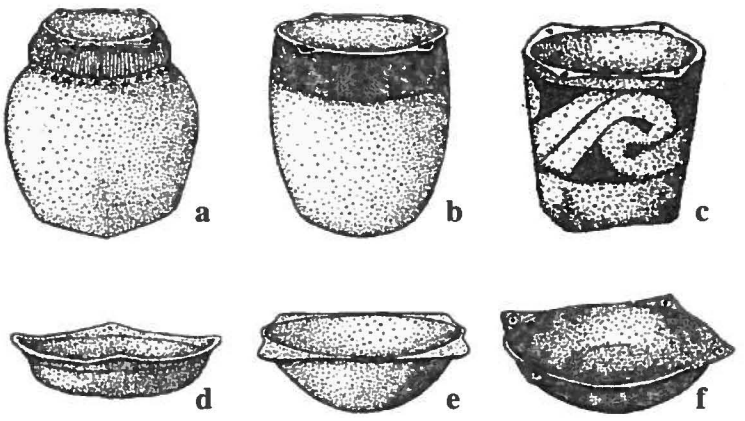

Figure 3. Examples of lugs on Coles Creek vessels: (a-c) Joffrion lugs, (d-f) Jackson lugs (adapted from Ford [1951]).

illustrations rather than the pots themselves undoubtedly introduces some inaccuracies; however, accessing the original sherds was not possible for this study.[4] The published drawings provide more accurate estimations of vessel shape than is possible from the fragmentary ceramic assemblages of any recently excavated Coles Creek site. That said, because the drawings were published with no scale, I was unable to use direct measurements to compare the vessels; instead, I used eight key ratios (Table 2). Of these, the one most sensitive to general vessel shape is the ratio of height to diameter at the widest point (H:WP).

Table 1. List of the measurements taken on each vessel and the abbreviations used to refer to these measurements.

Measurement	Abbreviation
Rim Diameter	RD
Diameter at the Widest Point	WP
Diameter at Shoulder	SD
Height	H
Height at the Widest Point	H@WP
Height at Shoulder	H@SD

Histograms were used as a method of exploratory data analysis to reveal patterns in the data (as outlined in Shennan 1997:25-27)[5]. A histogram of all H:WP values shows separate modes for bowls, restricted bowls/pyramidal beakers, beakers, and restricted jars/necked jars (Figure 4). The H:WP histogram can be broken apart to highlight the differences between vessel forms that have similar definitions when relying only on the visual observations used above (i.e., bowls/beakers and restricted bowls/restricted jars), clearly demonstrating good reason to divide them (Figure 5).

In addition to quantifying and displaying variation among vessel shape categories, I quantified variation within categories to see if there was reason to subdivide them. For example, researchers working in the Southeast have divided bowls into subcategories such as plates, shallow bowls, deep bowls, etc. (e.g., Ryan 2004:92; Wells 1998:172). To determine if there was any quantitative basis for subdivision, I created histograms of the H:WP values for each vessel class separately. Five of the six shape categories showed potential subcategories based on distinct breaks or multimodal distributions (Figure 6). Beginning with beakers, there is a natural break between H:WP values of 1.10 and 1.17. Visually, this represents a shift from beakers with walls that slant outward from the base to the rim (n = 12) to beakers with vertical sides (n = 4) (Figure 7).[6]

Bowls, which are most commonly divided into subcategories by other researchers, have the most significant patterning. The trimodal distribution suggests three legitimate subcategories: shallow bowls (H:WP values below 0.20, n = 3), simple bowls (H:WP values between 0.25 and 0.35, n = 11), and deep bowls (H:WP

Table 2. List of the ratios constructed for all whole vessels and what those ratios represent about vessel shape. * - applies only to necked vessels; may take the place of the ratio immediately above it.

Ratio	Measure	High Value	Low Value
RD:WP	Constriction at Rim	Less Constricted	More Constricted
SD:WP	Constriction at Shoulder*	Less Constricted	More Constricted
H:RD	Containment Security	High	Low
	Frequency of Access	Low	High
H@SD:SD	Containment Security*	High	Low
	Frequency of Access*	Low	High
H:WP	Shape of Vessel	Tall and Skinny	Short and Squat
H@WP:WP	Rate of Constriction at Base	Gradual	Rapid
H@WP:H	Location of Widest Point	High on Vessel	Low on Vessel
RD:SD	Degree of Flare in Neck	More Flared	Less Flared

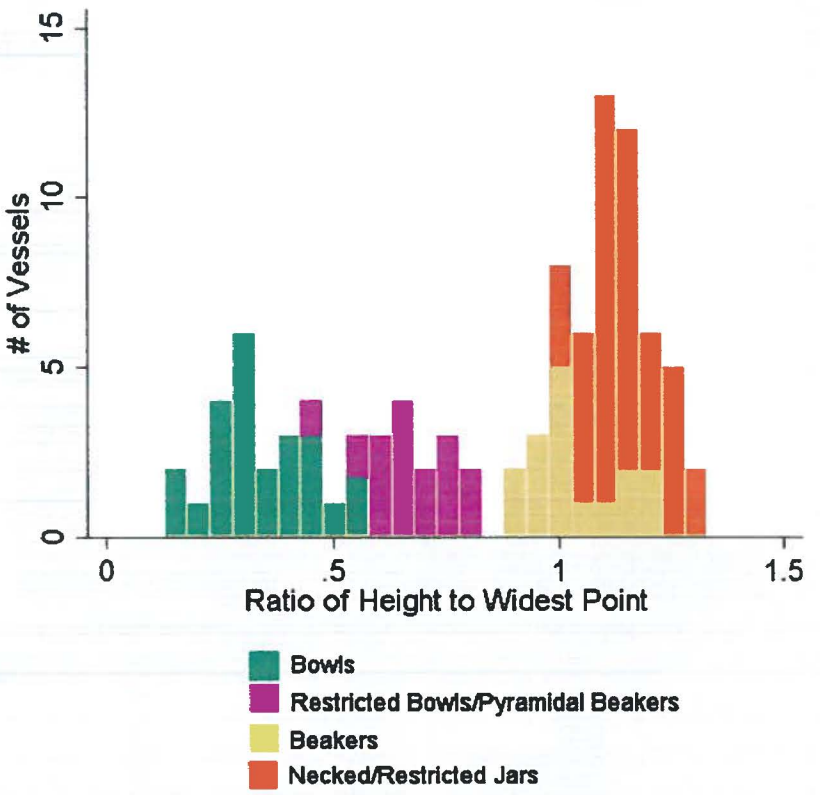

Figure 4. Histogram of H:WP values for all vessels showing a modal distribution that indicates separation between the vessel form categories.

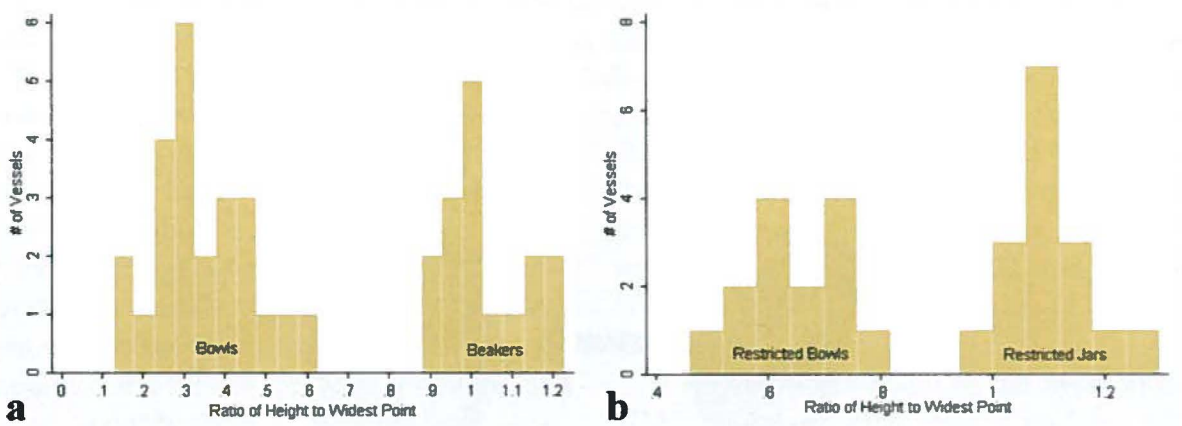

Figure 5. Histograms of H:WP values indicating clear separation between vessel categories with the same basic definition: (a) bowls versus beakers, (b) restricted bowls versus restricted jars.

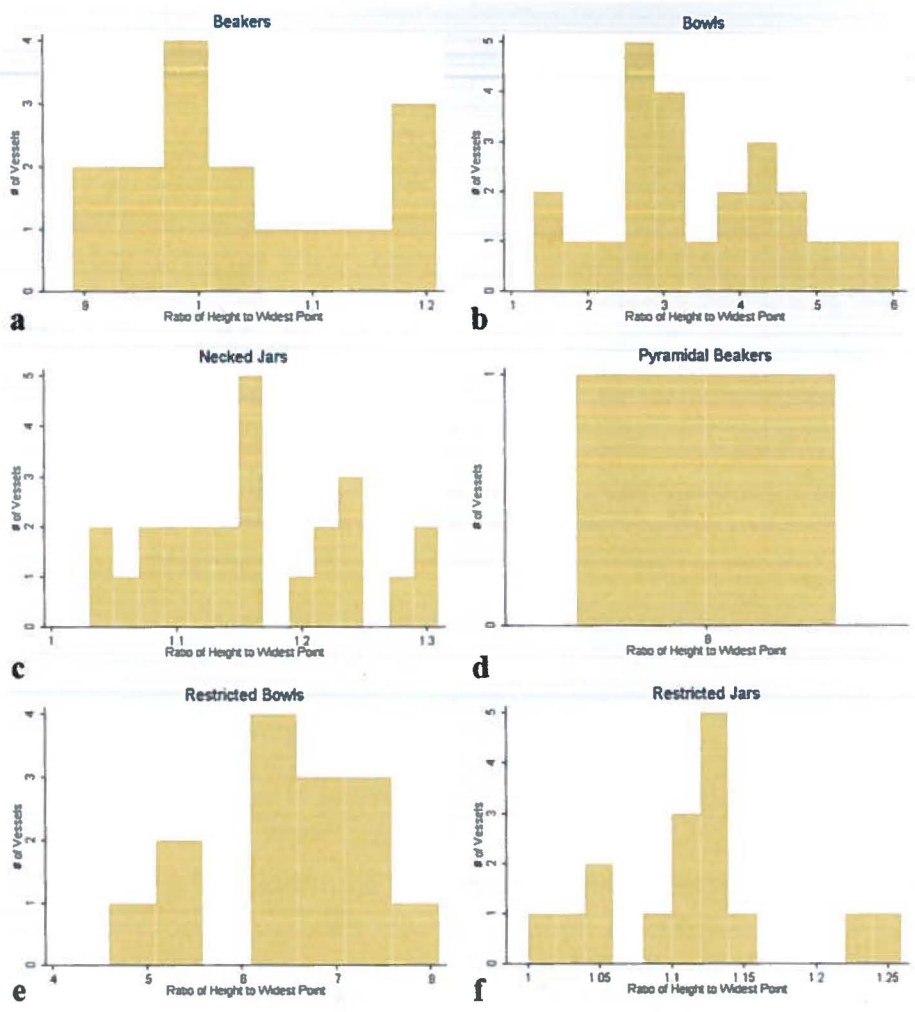

Figure 6. Histograms of H:WP values for each vessel shape category demonstrating potential subcategories in five of the six groupings: (a) Beakers showing two potential subcategories, (b) Bowls showing three potential subcategories, (c) Necked jars showing three potential subcategories, (d) Pyramidal beakers showing only one category, (e) Restricted bowls showing two potential subcategories, (f) Restricted jars showing three potential subcategories.

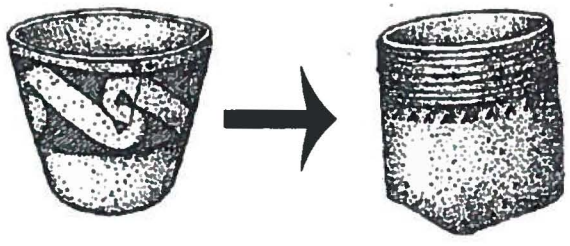

Figure 7. Illustration of the change in beakers as H:WP value increases bimodally, possibly indicating two subcategories: expanding and straight-sided beakers (adapted from Ford [1951]).

Figure 8. Illustration of the change in bowls as H:WP value increases trimodally, possibly indicating three subcategories: shallow bowls, simple bowls, and deep bowls (adapted from Ford [1951]).

values above 0.40, n = 10) (Figure 8). While these categories are not discrete, there is quantitative validity to the bowl subcategories employed by other authors.

No visual differentiation between the three modes apparent on the necked jar histogram could be made. That said, Braun (1980:172) recognizes the shape of the vessel mouth and vessel walls surrounding the mouth as relating closely to vessel function. In this case, it may be more productive to examine variables such as neck length, neck contour, degree of flare in the neck, and location of the point of maximum constriction. This has not been attempted here because these minute measurements are difficult to make accurately on the published drawings.

The histogram for restricted bowls shows two potential subcategories. While the three vessels with the lowest H:WP values are somewhat shorter and squatter than the rest (and the vessel with the highest H:WP value approaches the form of a necked jar), I see no compelling reason to subdivide this vessel shape. While it is possible that a different measurement, such as degree of restriction, would be a better predictor of subcategories, plotting the ratio of rim diameter to diameter at widest point (RD:WP) for all restricted bowls produces a clear unimodal distribution. Finally, the histogram of H:WP for the restricted jar category shows three potential subcategories, while the histogram of RD:WP shows a potential bimodal distribution. Visually, the variation among these vessels appears continuous, and I see no reason to divide them.

Assigning Function to Shape Categories

Ethnographic studies have shown that there are predictable relationships between vessel shape and vessel function (Braun 1980; David and Hennig 1962; DeBoer 1974; Hally 1983a; 1986; Henrickson and McDonald 1983; Shepard 1956; Smith 1988), and thus various measures of vessel form can be used to infer what activities may have been performed using a given ceramic assemblage. The ratio of height to rim diameter (H:RD) most directly relates to two common measures of vessel function: degree of containment security and frequency of access.[7] Degree of containment security (CS) refers to the ability of a vessel to hold its contents without spilling due to either depth or rim angle; thus, a deep vessel (especially one with a restricted orifice) will have a high CS value and a shallow, unrestricted vessel will have a low CS value. Frequency of access (FA) refers to the volume of material that may pass through the vessel orifice per unit time; thus, a vessel with a wide orifice will have a high FA value and a vessel with a narrow orifice will have a low FA value (Braun 1980:172). Commonly, storage vessels will have low FA and high CS, serving vessels will have high FA and low CS, and food preparation or cooking vessels will have high FA and high CS (Braun 1980:172; see also Henrickson and McDonald 1983). In terms of the ratios calculated for the whole pots in this dataset, I would therefore expect that storage vessels would have a high H:RD, serving vessels would have a low H:RD, and food preparation or cooking vessels would have an H:RD in the middle ranges.

I created a bar graph of the mean H:RD (or H@SD:SD) ratios for each vessel class (Figure 9). If functional categories were clearly visible, I would have expected to see three distinct groupings—one group with low values, one with middle values, and one with high values. It could be argued that this did occur, with shallow bowls, simple bowls and deep bowls having values below 0.5, restricted bowls and flaring beakers having

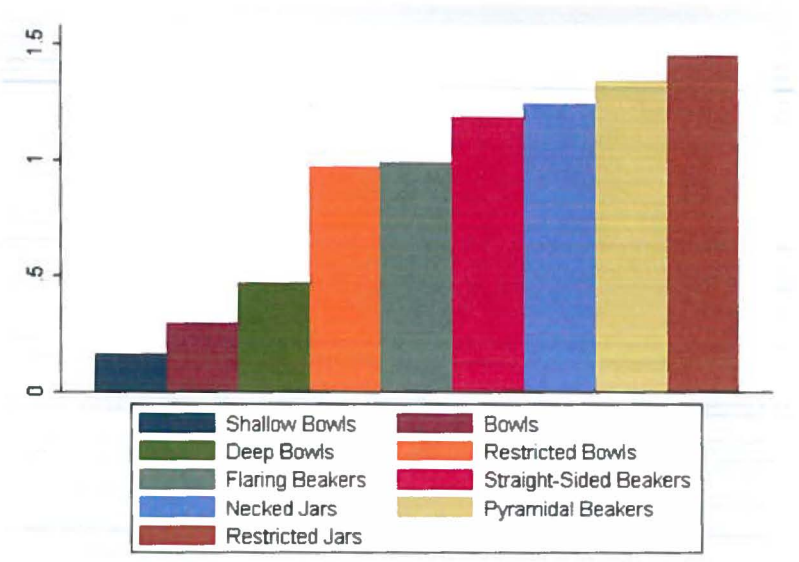

Figure 9. Bar graph of the mean H:RD (or H@SD:SD) values for all vessel shape subcategories, showing potential clusters.

values right around 1.0, and straight-sided beakers, necked jars, pyramidal beakers, and restricted jars having values above 1.2. That said, this result does not fit with the commonly accepted functions for these vessel types, as it would eliminate jars from the cooking vessel category altogether.

The histogram of H:RD (or H@SD:SD) values for individual vessels shows a more meaningful trimodal distribution (Figure 10). A cluster of vessels with H:RD values below 0.6 could be serving vessels; this category contains all of the bowls and one restricted bowl. A large cluster of vessels with H:RD values of 0.7 to 1.9 could be cooking vessels; this category contains most of the beakers, jars and restricted bowls. And finally, a small cluster of two necked jars with H@SD:SD values above 2.0 could be storage vessels.

With regard to the commonly accepted uses of different vessel forms, this division appears to fit reasonably well—bowls are serving vessels, beakers, restricted bowls and some jars are cooking vessels and other jars are storage vessels (cf. Boudreaux 2010). (Beaker function will be discussed in more detail below, when vessel size can be taken into consideration). Specifically, the presence of only necked jars in the storage category matches Fontana et al.'s (1962:48) recognition that "pots meant to be used for storage have smaller openings as a rule, and they have rims enabling one to tie a thong around them to secure a covering." If these categories are accepted, however, this does raise concern about using the Greenhouse collection of complete vessel forms to explicate other, more fragmentary Coles Creek collections because the model assemblage seems to underrepresent storage vessels. While it is not surprising that storage vessels would be underrepresented, as they tend to be larger, coarser, and less decorated than other categories (and thus not as interesting for Ford or Phillips to illustrate), this underrepresentation in the model assemblage may cause some vessel categories present in the archaeological assemblages to be misidentified.

Disclaimers

This rough categorization provides a starting place for functional analysis, but it is undoubtedly oversimplified. Other aspects of vessel shape must also be taken into consideration. Braun (1980) argues for a focus on vessel mouth characteristics. This could be a fruitful area of future research as measurements that speak to this differentiation were not included here. We must also acknowledge that "the same shape may have a variety of uses, and conversely the same purpose may be served by many forms" (Shepard 1956:224). For example, size may actually be an equal (or better) deter-

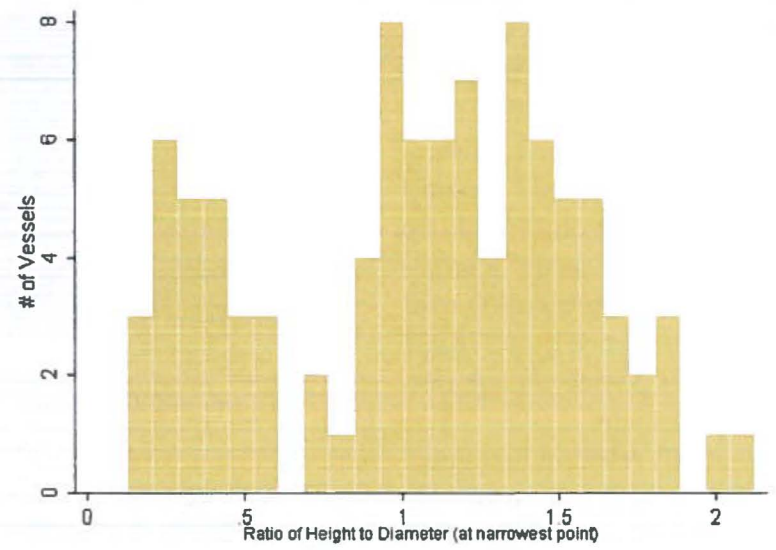

Figure 10. Histogram of all H:RD (or H@SD:SD) values showing a clear trimodal distribution.

minant of vessel function (Braun 1980:183; Childress 1992; Cruciotti et al. 2006; David and Hennig 1962:33-48; DeBoer 1974:336; Hally 1984:52; Henrickson and McDonald 1983:632; Smith 1988:914; Wilson and Rodning 2002). Though the subcategories described in the previous section may detect some differentiation in size, they largely measure differences in shape. Because all drawings were made with no reference to scale, it is impossible to tell the difference between a large and small version of the same vessel shape.

Shepard (1956:224) recognizes that we cannot know the variety of uses that prehistoric people may have had for ceramic vessels. Consequently, we may be over- or under-emphasizing certain functions based on our biases, misinterpreting the use of a particular pot based on faulty assumptions, or even ignoring some common uses of vessels altogether. That said, this does not negate the usefulness of attempting a functional analysis of a given archaeological assemblage. "It is here maintained that individual vessels were constructed with a particular range of uses in mind. Even if a single vessel were put to an originally unintended use, the vast majority of vessels of similar form would still be used primarily as intended" (Braun 1980:173). While this intended use is what is being studied here, it is essential to draw attention to the importance of incorporating other means of determining vessel function in future studies.

Analyses of rim and base form can identify vessels particularly well adapted to pouring, lifting, or retaining liquids (Braun 1980:173-174; Henrickson and McDonald 1983; Sassaman 1993; 2002; Shepard 1956:247). Likewise, the inclusion of wall thickness, temper, surface finish, decoration, and paste characteristics (Boudreaux 2010; Braun 1980:173; 1983; Childress 1992; DeBoer 1974:336; Johnson 2003; Henrickson and McDonald 1983; Sassaman 1993; 2002; Steponaitis 1983; 1984) may significantly augment functional analyses. Equally importantly, studies of the residues, use-wear, and thermal alteration on a vessel have the potential to explain not only a vessel's intended use, but also its actual use(s) (or even reuse) (Boudreaux 2010; Hally 1983b; 1986; Kobayashi 1994; Sassaman 1993; Schiffer et al. 1994; Skibo 1992; Wilson and Rodning 2002).

The Feltus Assemblage

Excavations from 2006–2012 by the Feltus Archaeological Project (Steponaitis et al. 2012; Steponaitis et al. 2014) recovered over 40,000 sherds, thus providing an opportunity to test the utility of these shape categories in a collection of fragmentary specimens. Three attributes recorded during my analysis (Kassabaum 2014) of the assemblage relate directly to vessel shape

and size: rim angle, vessel form, and rim diameter. I analyzed 3,054 rim sherds from the site and was able to identify rim angle on 1,165 (38 percent) using the categories illustrated in Figure 11. Based on this measurement and other obvious shape characteristics, I was able to identify vessel form for 1,127 (37 percent) of the rim sherds, of which 881 (29 percent) could be confidently identified to a single vessel form.[8] Rim diameter was recorded only for sherds representing over five percent of the vessel's circumference (n = 378, 12 percent), as smaller sherds did not posses enough curvature to give an accurate measurement.

With respect to other potentially relevant functional attributes, I also recorded rim form, presence of lugs and other rim decorations, wall thickness, temper, and surface decoration for each sherd (Kassabaum 2014). For the purposes of this paper, these attributes are mentioned only when they show potentially meaningful functional distributions. Paste remained fairly consistent throughout the assemblage and is not considered here. Very few bases were recovered, thus no attempt to model basal form was attempted. Finally, residues and use-wear were not recorded systematically for the Feltus materials due to the highly fragmentary nature of the collections. Large portions of vessels are required for confident identification patterns in use-wear or sooting (Boudreaux 2010:11). Further excavation and a more concerted attempt at vessel reconstruction followed by systematic recording of use-wear, thermal alteration, residues, and sooting patterns, would provide a fruitful area for future research on this collection.

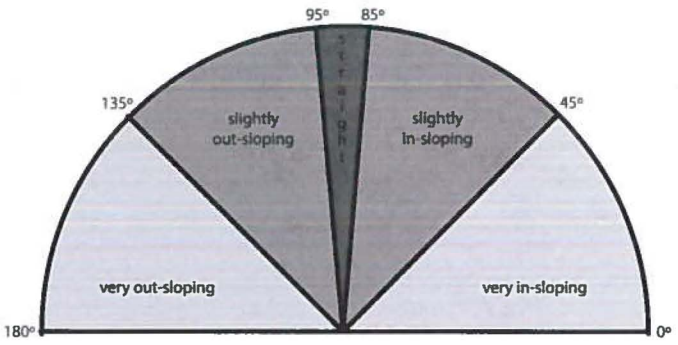

Figure 11. Diagram showing the rim angle categories used in the Feltus rim sherd analysis.

All categories identified in the model assemblage were present in the Feltus assemblage with the exception of pyramidal beakers. In some cases, other details of vessel shape could be used to make more specific vessel shape assignments, including plates (i.e., extremely shallow bowls showing almost no upward cur-

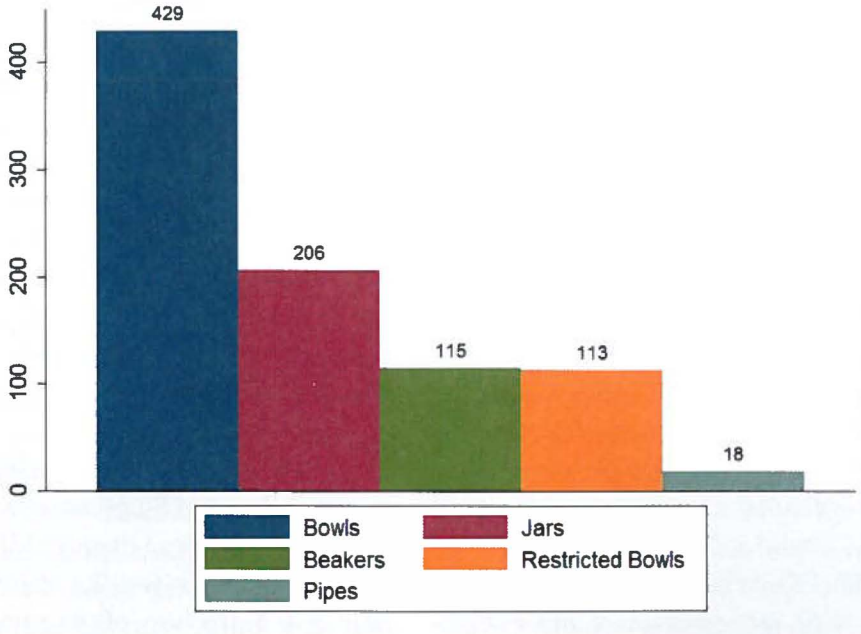

Figure 12. Bar graph of confidently identified vessel forms at Feltus (n = 881).

vature), carinated bowls, and pipes. Bowls were the most common vessel form, followed by jars, then beakers and restricted bowls, and finally pipes (Figure 12).

Bowls make up nearly half of the identified assemblage (n = 429) and could be divided into five categories: deep bowls, simple bowls, shallow bowls, plates, and carinated bowls (Figure 13).[9] Deep bowls (rim angle = 90°–112.5°, n = 60) approach the shape of a beaker, but are not as tall and generally show more curvature in their walls; simple bowls (rim angle = 112.5°–135°, n = 289) are the most common bowl form at Feltus and have out-sloping walls; shallow bowls (rim angle = 135°–157.5°, n = 57) are shorter and flatter than simple bowls; and plates (rim angle = 157.5°–180°, n = 6) are almost flat. Carinated bowls (n = 8) are defined based on the presence of an angular inflection point in the vessel wall.

Bowls at Feltus range from 7 to 53 cm in diameter. A histogram of rim diameter for simple bowls suggests a number of distinct size categories (see also Hunter et al. 1995:170-171; Roe 2010:149; Ryan 2004:151-154) (Figure 14). In general, bowls were food preparation and serving vessels, as their unrestricted orifices make them ineffective storage vessels (Braun 1980; Rice 1987; Wells 1998). Subcategories of bowl shape help to further differentiate function. Deep bowls may have served as cooking as well as serving vessels (see Ryan 2004:154), while simple bowls, shallow bowls, and plates were likely used only for serving and food consumption.

Jars are the second most common vessel form at Feltus (n = 206). I identified two shape subcategories: restricted and necked (Figure 15). Restricted jars are by far the more common form (n = 157),[10] with necked jars accounting for only about a quarter of the jar assemblage (n = 49). They range from 7 to 35 cm in diameter with most examples falling around 20 cm. Despite possible shape subcategories being identified in the model assemblage, shape or size classes are not visible in the Feltus data (see also Roe 2010:139).

The wide size range may indicate that jars served multiple functions, likely focused on cooking and storage (Jones 1996:3; Lee et al. 1997:9.75; Roe 2010:137; Wells 1998:179-185). Looking only at restricted jars, Wells (1998:179) reports that many had everted lips, rim straps, thickened rims, lugs, or Coles Creek Incised

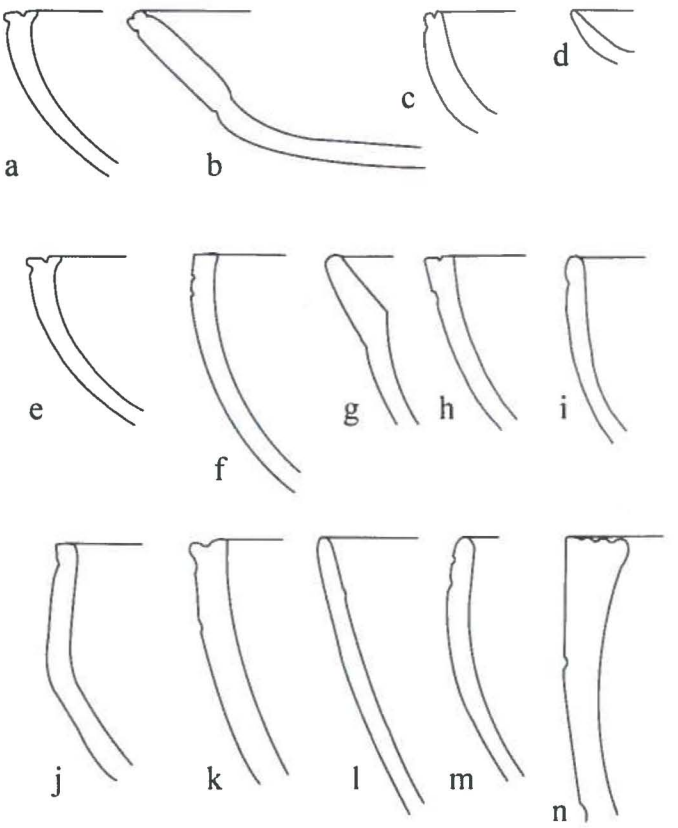

Figure 13. Rim profile drawings of bowls from Feltus: (a-d) shallow bowls, (e-i) simple bowls, (j) carinated bowl, (k-n) deep bowls.

designs that may have served to anchor lids for storage. In the Feltus collection, lugs are entirely absent from the jar assemblage, but Coles Creek Incised designs are the most common decorative motif. Wells (1998) also reports sooting and use-wear inside the rim, presumably from stirring or dipping, indicating a cooking function. The rounded walls and slightly restricted orifices of these jars are common characteristics of cooking vessels (Hally 1986; Lee et al. 1997; Ryan 2004; Wells 1998), but their high level of decoration is not (Roe 2010:139). Discriminating between cooking and storage functions will thus rely on more detailed studies of residues and use-wear. Though cooking uses are also possible for necked jars, their more extreme restriction means they were most likely used for storage, especially as their defined necks provided a convenient point to attach a lid (Lee et al. 1997:9.75). Beakers were the third most common vessel form at the site (n = 115) (Figure 16). While the beakers in the model assemblage are dominated by slightly out-sloping exam-

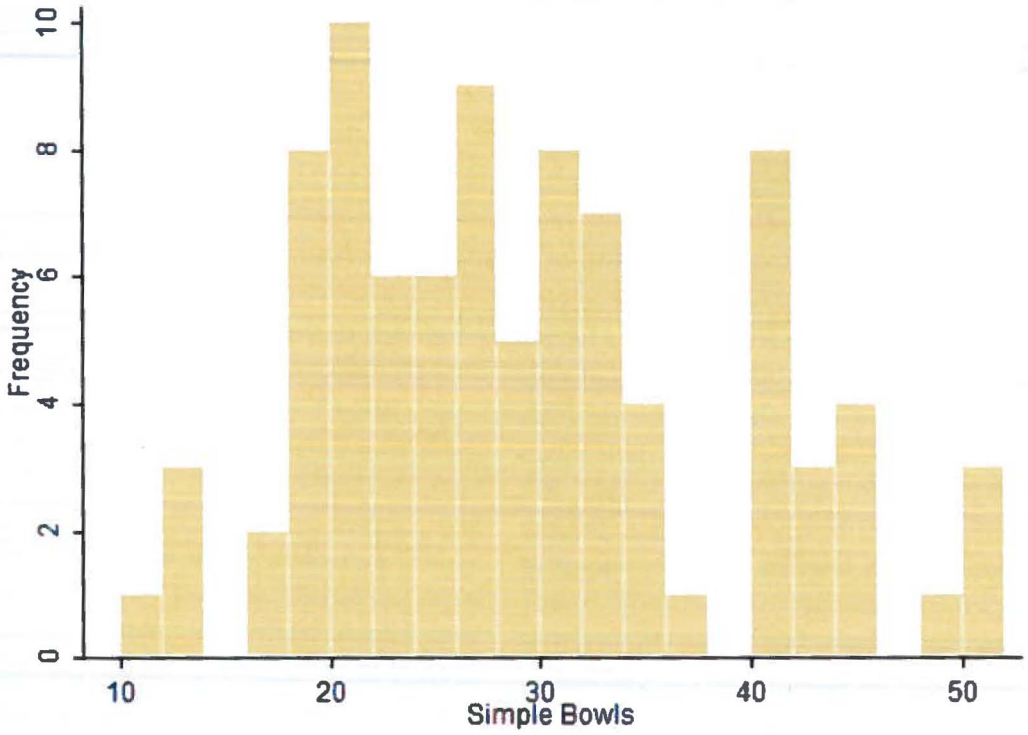

Figure 14. Histogram of rim diameter measurements for simple bowls showing potential size categories.

ples, the Feltus assemblage is dominated by straight-sided examples. When combined with the lack of the pyramidal beaker form, I see no reason to subdivide the Feltus beakers into subcategories based on rim angle. The beakers at Feltus range in diameter from 10 to 40 cm, with 19 to 23 cm being the most common. Variation in beaker size has temporal associations, with large beakers appearing in higher frequencies at Baytown and early Coles Creek sites and small beakers appearing in higher frequencies at late Coles Creek sites (see also Jones 1996; Wells 1998:175; Ryan 2004:246). This temporal shift is evident in other attributes as well. Simple or thickened rims on large, thick beakers are common at early Coles Creek sites, while tapered rims on small, thin, burnished beakers dominate later (Jones 1996; Kidder 1990; 1993; Lee et al. 1997:9.74-9.75; Roe 2010:152; Wells 1998:175). The later beaker style is absent at Feltus.

While the literature often assumes that beakers were serving cups, the larger, heavier beakers would be unwieldy in such a role. Jones (1996:3) suggests that they were short-term, dry storage containers, noting examples with thickened rims or rim straps that would have allowed Coles Creek people to attach pliable lids. Wells (1998:175) confirms this functional assignment and suggests that lugs and Coles Creek Incised lines near the rim could have served as anchors for such coverings (see also Roe 2010:133). Lugs were absent from this vessel form at Feltus and thickened rims were exceptionally rare, but Coles Creek Incised lines (n = 74) are by far the most common decorative motif, far exceeding even plain versions (n = 24). Though residues and use-wear were not recorded systematically for the Feltus materials, sooting was noted on numerous beakers, indicating that at least some were used as cooking vessels.

The Feltus data, when combined with comparative data from other Coles Creek sites, confirm the pattern that beakers start out large with untapered rims and eventually become smaller with tapered rims (Jones 1996; Lee et al. 1997; Roe 2010). This indicates a dramatic shift in function, with earlier, larger beakers used as either storage or cooking vessels and later, smaller beakers used as serving vessels for liquids (see also

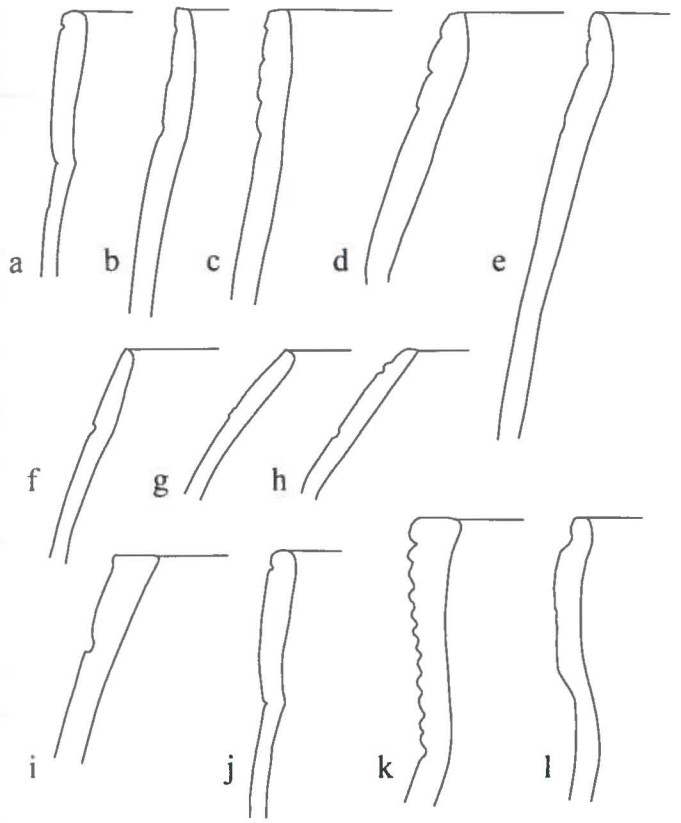

Figure 15. Rim profile drawings of jars from Feltus: (a-i) restricted jars, (j-l) necked jars.

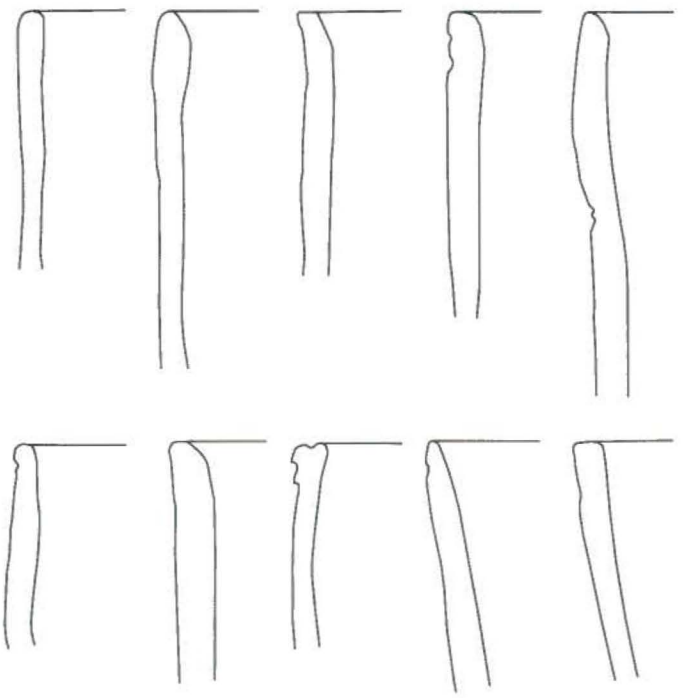

Figure 16. Rim profile drawings of beakers from Feltus.

Roe 2010:152; Ryan 2004:155). This functional difference between subclasses of similarly shaped vessels may have important implications for site function, and future functional analyses of Lower Mississippi Valley ceramics should draw this distinction whenever possible using rim form and rim diameter.

Restricted bowls occur at Feltus with approximately the same frequency as beakers (n = 113) (Figure 17). This category combines Wells's (1998:179) globular and sub-globular bowl categories and is referred to as globular by other authors as well (Jones 1996; Roe 2010). Restricted bowls range from 4 to 45 cm in diameter in two size classes (see also Jones 1996:3; Roe 2010:152); at Feltus, most range from 4 to 27 cm with two exceptionally large examples. These restricted bowl forms are better suited to cooking or possibly storage than serving, which is why I have separated them from open bowl forms (cf. Lee et al. 1997; Roe 2010; Ryan 2004).

Finally, while pipes are quite rare compared to other vessel forms (n = 18), they are more common at Feltus than at other Coles Creek sites, making up about two percent of the identifiable rim sherds. They range from three to seven cm in diameter. Williams and Brain (1983:213-214) identify two distinct late prehistoric pipe forms: platform pipes and elbow pipes. Though many of the Feltus pipes are identified based only on small rim diameter and/or unusual curvature of the vessel wall, four examples are tentatively classifiable as to type. All four are elbow pipes, though with some unusual characteristics that suggest they may represent a transitional form between the platform pipes common in earlier periods and the classic elbow pipes of later periods.

Discussion

The Feltus assemblage was well characterized by the study of Coles Creek vessel forms outlined in the first portion of this article. It is made up of relatively simple vessel forms including unrestricted bowls and beakers and restricted bowls and jars. Only occasional necked jars and carinated bowls demonstrate complex

vessel profiles. While the proportions change by context, bowls were always the most common vessel form, making up 33–67 percent of any given analysis unit. In most contexts, jars are the next most common vessel form; however, in two cases, beakers are second most common. While jars, restricted bowls, and most beakers are cooking or storage vessels, open bowls are serving vessels. In the archaeological record more generally, cooking vessels typically "dominate domestic vessel refuse because, subjected to rapid heating and cooling and moved around often, they frequently break" (Roe 2010:132; see also Boudreaux 2010:25; David 1972:141; Pauketat 1989:292). Feltus reverses this pattern. The predominance of the bowl form at Feltus thus indicates an emphasis on serving, rather than preparing or storing food.

The nature of the activities taking place at Feltus is elucidated by an examination of stratigraphic context. Extensive excavations on and around each of the remaining mounds, as well as in the plaza, along with a series of fifteen radiocarbon dates, show a 400-year history of occupation with little evidence for permanent habitation. Rather, the data imply episodic use as a ceremonial center by a dispersed population resulting in large, dense middens, which accumulated rapidly in certain site areas during different times. Most of the ceramic materials discussed here were recovered from these rapidly deposited middens and have been interpreted as feasting debris based on contextual and food remains data (Kassabaum 2014, 2018). The functional analysis presented here, along with more detailed analyses of vessel size trends, supports this interpretation.

In recent decades, vessel form analysis has become standard practice in the Lower Mississippi Valley, and most studies use roughly comparable methods to identify vessel shape and size (e.g., Hunter et al. 1995; Jones 1996; Kidder 1993; Lee et al. 1997; Roe 2010; Ryan 2004:89-160; Wells 1998). This practice, when combined with the relatively limited suite of vessel forms, allows assemblages from most Coles Creek sites to be compared with only minor standardization of terminology. This article has attempted to use whole-vessel illustrations and a large excavated collection to further standardize the language used to describe these forms and to provide formal and well-justified definitions. Perhaps the most important change applied here involves separating restricted bowls from open bowls due to important functional differences between the classes.

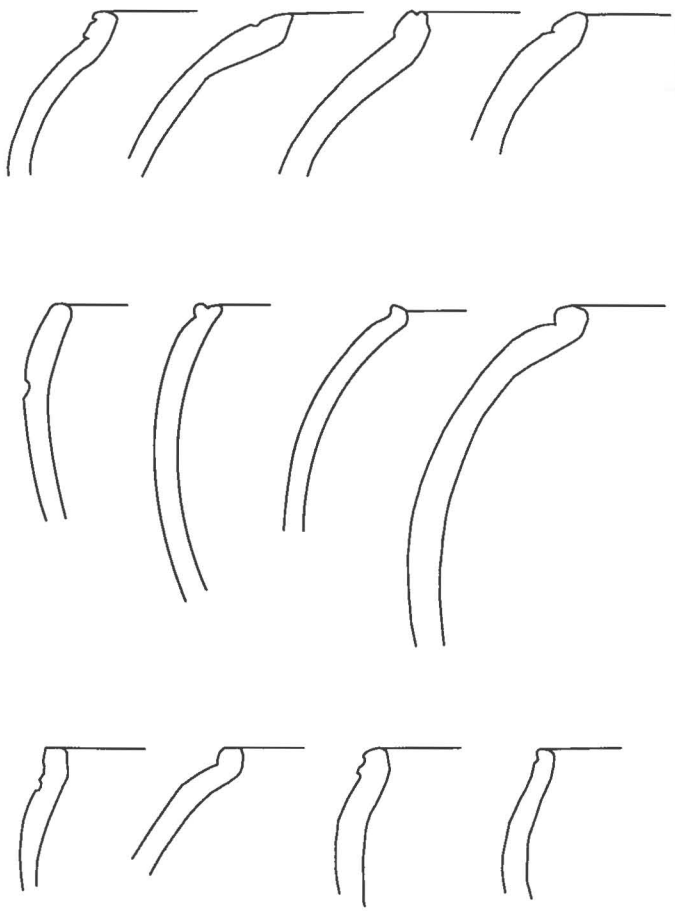

Figure 17. Rim profile drawings of restricted bowls from Feltus.

Acknowledgements. This archival and lab work for this project was done in the Research Laboratories of Archaeology at the University of North Carolina, Chapel Hill. Two undergraduate students, Vanessa Patchett and Mike Goldstein, were involved in its early stages. Major thanks are owed to Vincas Steponaitis and John O'Hear, who co-directed the Feltus Archaeological Project. Vin, of course, also served and continues to serve as a model mentor for all things ceramic. While many of the ideas here were developed with his guidance, all errors are entirely my own.

Notes

[1]Beakers are identical in definition to bowls, however, they are taller.

[2]A neck is defined as the area "between body and rim, marked by constriction and change in orientation of the vessel wall" and the presence of one or two independent IP or CP (Sinopoli 1991:228; see also Shepard 1956:230).

[3]Restricted jars are identical in definition to restricted bowls, however, they are taller.

[4]The ceramic collections on which these illustrations are based are housed in a variety of curation facilities across the United States. Those illustrated in Ford (1951) are housed either at the American Museum of Natural History in New York or the Department of Geography and Anthropology at Louisiana State University in Baton Rouge. At this time, it is unknown which sherds provided the basis for the published illustrations. The illustrations in Phillips (1970) come from a wide variety of sources, including collections housed at the Peabody Museum of Archaeology and Ethnology at Harvard University in Cambridge, Massachusetts, others are from previously published literature, and still others based on Phillips's personal survey of ceramic materials in other museum collections. While relocating the sherds, reconstructing the vessels, and potentially obtaining more accurate measurements is a possible avenue for future research, at this time I am unconvinced that the inaccuracies involved in measuring illustrations warrant that effort.

[5]Significance tests were not applied due to already subjective nature of the illustration assemblage and the use of exploratory data analysis rather than hypothesis-driven statistical analysis at this stage. The goal of this analysis was to identify and quantify patterns of substantive rather than statistical significance (see Shennan 1997:68).

[6]The previously identified category of pyramidal beakers sets a precedent for relying on differences in wall angle to create additional categories.

[7]If the vessel has a shoulder, then the ratio of height at the shoulder to shoulder diameter (H@SD:SD) relates most directly to CS and FA.

[8]This means that only 38 (~1 percent) of the analyzed rim sherds were large enough to determine rim angle but did not clearly fit into one of the previously identified shape categories. It is possible that these sherds represent vessel forms not identified in the initial analysis; however, in most cases the lack of identification was only due to the fact that too little of the vessel wall was included with the rim fragment to confidently determine wall contour. The remaining 246 sherds could be identified to one of two similar vessel forms, but did not include enough of the vessel wall to determine which was a more appropriate assignment.

[9]Unlike most authors, I do not include globular/restricted bowls in the bowl category due to the fact that degree of restriction likely has as much or more functional importance as does vessel height (Rice 1987:241; Shepard 1956:228-230).

[10]My category of restricted jars combines various categories used by other authors (e.g., Jones 1996; Lee et al. 1997; Wells 1998), including open jars, barrel-shaped jars, restricted jars, and possibly seed jars. Many sherds (n = 173) were classified as either restricted jars or restricted bowls. In most of these cases the sherd was too small to confidently estimate vessel height. Many of these vessels would fall into the "seed jar" category as defined by Jones (1996) and others.

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