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VESSEL ASSEMBLAGES AND FOOD HABITS: A COMPARISON OF TWO ABORIGINAL SOUTHEASTERN VESSEL ASSEMBLAGES

David J. Hally

Abstract

Vessel form analysis of pottery from the Savannah period Beaverdam Creek site in northeastern Georgia has resulted in the definition of a vessel assemblage composed of 15 morphological vessel types. Comparison of this vessel assemblage with that from the Lamar period Barnett phase in northwestern Georgia reveals interesting similarities and differences. The two assemblages are stylistically quite different, but are composed of a similar array of vessel forms. It is argued that the latter reflects the existence of similar food preparation, consumption, and storage patterns in the two cultures.

The archaeological investigation of pottery vessel function is currently progressing along several fronts. These include: ethnoarchaeological studies of pottery use among contemporary peoples (David and Hennig 1972; DeBoer and Lathrap 1979; Fontana *et al.* 1962; Foster 1960; Weigand 1969); laboratory experimentation with specific physical properties of pottery vessels (Braun 1980, 1983; Bronitsky 1982; Steponaitis 1983; Tankersley and Meinhart 1982); analysis of use wear and use residues (Bray 1982; Griffiths 1978; Hally 1983a); and identification of the function of individual vessel forms (Bray 1982; Drennan 1976; Morris 1971; Nelson 1980; Tankersley and Meinhard 1982; Turner and Lofgren 1966). In spite of the success researchers are having in these kinds of investigations, there have been few functional studies of entire vessel assemblages (Henrickson and McDonald 1983; Howard 1981; Lischka 1978) and virtually no attempts to investigate variability in vessel form and function between sites and between cultures (Shapiro 1983).

In my own work with pottery I have distinguished the vessel shape and size classes that characterize the late Lamar Barnett phase in northwest Georgia and have attempted to identify the manner in which those shape-size classes or morphological vessel types were used (Hally 1982b). Unfortunately, no comparable study has been undertaken elsewhere in the eastern United States, with the result that it is not possible to view the Barnett phase vessel assemblage in a larger cultural context.

Recent University of Georgia investigations at the Beaverdam Creek site (9Eb85) in northeastern Georgia have provided me with the opportunity to conduct a second vessel form analysis, this time with pottery from a slightly earlier period. In this paper, I describe the results of that analysis and compare the vessel assemblage with that from the Barnett phase.

Analysis of the Beaverdam Phase Vessel Assemblage

The Beaverdam Creek site (9Eb85) is located 800 m west of the Savannah River on Beaverdam Creek in Elbert County, Georgia (Fig. 1). The site consists of a single low platform mound and surrounding village. Excavations by the University of Georgia occurred in 1970 (Lee 1976) and in 1980–1981 (Rudolph and Hally 1984) as part of U.S. Army Corps of Engineers mitigation efforts in the Richard B. Russell Reservoir.

Major site occupation occurred during the early part of the 13th century and has been designated as the Beaverdam phase. Additional components of this phase are represented at the Rucker's Bottom site (Anderson and Schuldenrein 1983) in the Russell Reservoir and at the Chauga site (Kelly and Neitzel 1961) located 60 km to the north in Hartwell Reservoir. The phase bears strong ceramic similarities to the Savannah component at the Irene site (Caldwell and McCann 1941) at the mouth of the Savannah River and for this reason has been identified with Savannah II culture as defined by Caldwell (1952). Beaverdam phase ceramics also have numerous stylistic similarities with Etowah IV pottery in the Allatoona Reservoir of northwest Georgia (Caldwell 1955). Within the Russell Reservoir, Beaverdam phase ceramics develop directly into those characteristic of the early Lamar Rembert phase (Caldwell 1953) by A.D. 1350–1400.

Analysis of the Beaverdam Creek site ceramics has had three objectives: (1) to identify and describe the pottery types characteristic of the Beaverdam phase component; (2) to identify and interpret ceramic variability within the site; (3) to identify the morphological vessel types that constitute the Beaverdam phase vessel assemblage. The decision to investigate vessel form was based on my experience with the analysis of Barnett phase pottery. Excavation of house floors and burials at the 16th century Little Egypt and King sites (Hally 1983a, 1983b) yielded 81 whole and partially reconstructable vessels and several thousand sherds. The analysis of that material proceeded in four steps:

1. Comparison of the whole and partial vessels led to

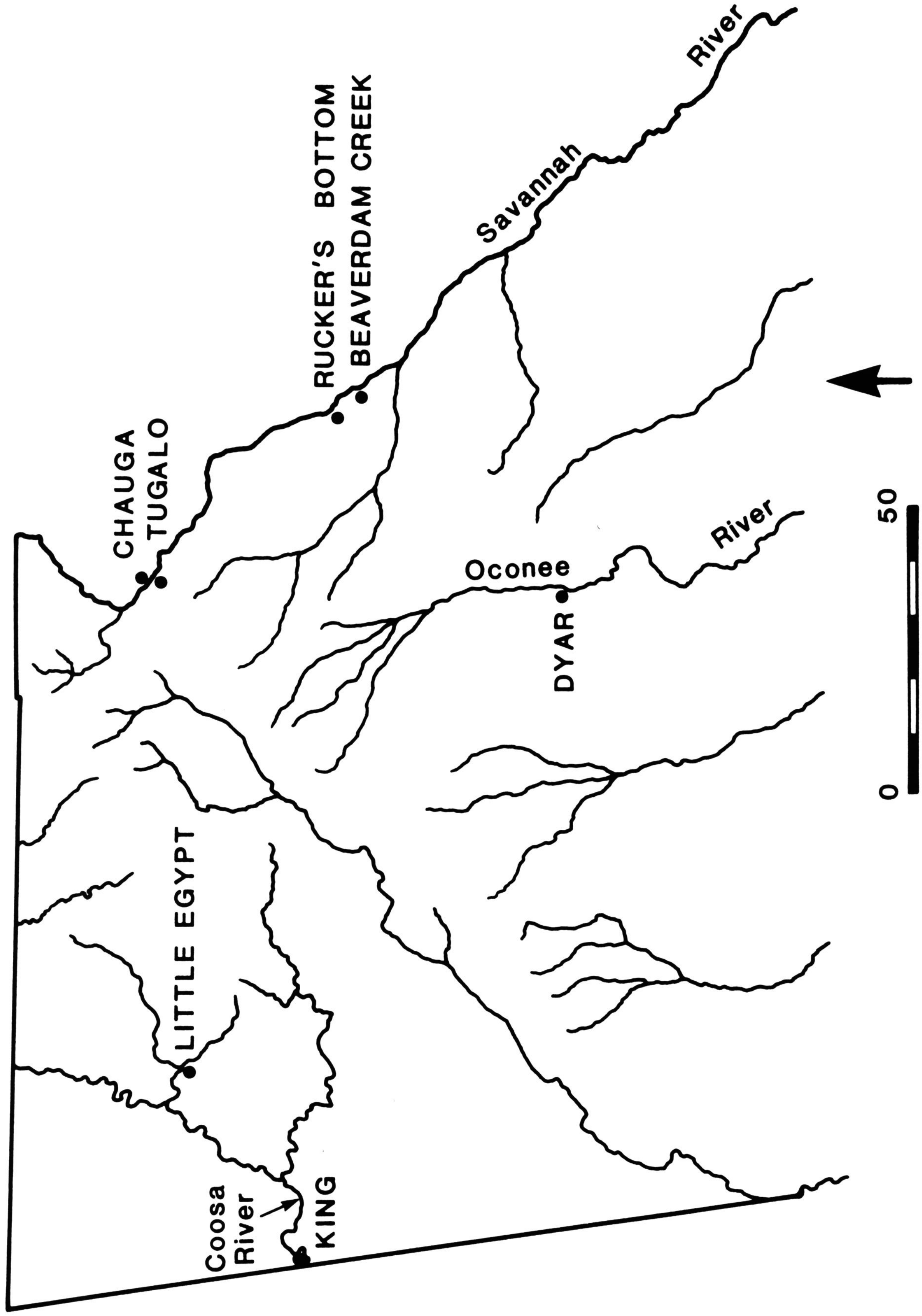

Figure 1. Map showing sites mentioned in the text.

the recognition of eight distinct vessel shapes.

2. Comparison of measurements taken on the whole and partial vessels demonstrated that orifice diameter was strongly correlated with maximum vessel diameter and height and with capacity (Hally 1982b) in most shape classes and hence could be used to estimate vessel size.

3. Orifice diameters were measured for the whole and partial vessels and all suitable rim sherds and were plotted by vessel shape in histograms. The distributions of orifice measurements indicated that at least four of the vessel shapes had been manufactured in multiple sizes. Altogether, 13 shape-size combinations or morphological vessel types were recognized in the pottery collections from the two sites.

4. Analysis of the distribution of exterior and interior soot deposits and interior surface pitting among the 13 morphological types indicated that most, if not all, had had distinct functions (Hally 1983a).

The Beaverdam site pottery collection contains only two whole and two partial vessels. As a result, the analysis of Beaverdam phase vessel form differs in several important respects from the Barnett phase analysis:

1. Vessel shape identifications have been made almost exclusively through the analysis of large sherds, especially rim sherds.

2. The form of vessel bases cannot be identified for most shape classes.

3. It is not possible to determine whether orifice diameter is a good predictor of vessel size. In the present study, it has been assumed to be.

4. It is not possible to determine reliably the relationship of use alterations to vessel types. Soot deposits occur on many rim sherds, and in those cases it is possible to infer use over fire for the parent vessels. The absence of soot, however, it not trustworthy evidence for mode of use because soot deposits do not always extend up to the vessel rim. Interior surface pitting does not extend above the shoulder of jars in the Barnett phase, and for this reason cannot be reliably observed in the Beaverdam site study collection.

As a first step in analysis of Beaverdam phase vessel form, rim sherds that possessed a large amount of vessel wall were sorted from the pottery collection. Vessel shape classes were then identified by visual comparison of the profiles of these sherds and the available whole and partially reconstructed vessels. Once a tentative vessel shape classification had been achieved, the remaining rim sherds in the collection were examined for the purpose of identifying additional representatives of each class and confirming the shape classification.

Over 1000 rim sherds were recovered from the site during excavations in 1980 and 1981, but only 235 were sufficiently large to allow vessel shape identification. These sherds constitute what will be referred to as the rim sherd sample. The sherds assigned to each shape class were also compared for the purpose of determining which if any came from common parent vessels. That endeavor revealed only one case where two sherds could be attributed to a common parent vessel. Based on this finding, it is my opinion that almost all sherds in the rim sherd sample represent distinct parent vessels. Only in one class, the straight rim bowl, is it likely that some unrecognized vessel duplication may occur.

Reasonably accurate orifice diameter measurements were obtained for 162 sherds in the rim sherd sample. Orifice diameter measurements for these sherds and the two whole and partial vessels were plotted by vessel shape class in histograms. Vessel size classes were identified with the aid of the Shapiro-Wilk W test statistic (Shapiro and Wilk 1965).

The Beaverdam Phase Vessel Assemblage

Eight vessel shapes can be distinguished in the Beaverdam Creek site pottery collection (Fig. 2, Table 1). These may be briefly described as follows.

Tall Neck Jar

This is a shouldered jar with an outflaring rim and relatively tall neck. Configuration of the vessel base cannot be determined with the available ceramic evidence but is almost certainly rounded. Rims are occasionally thickened slightly. The paste is grit-tempered. Exterior surfaces are predominantly complicated stamped and check stamped, but coarse plain surfaces are also represented.

Short Neck Jar

This is a deep cauldron with nearly vertical walls. The upper portion of the vessel is characterized by an outflaring rim, a short neck with a sharply curved profile, and little neck constriction. Configuration of the vessel base cannot be determined with the available ceramic evidence, but it is almost certainly rounded. The paste is grit-tempered. Exterior surfaces are most commonly coarse plain, but check stamped and complicated stamped treatments also occur.

Carinated Bowl

This is a deep bowl with a vertical or slightly insloping rim and pronounced break in the profile where the rim and lower vessel wall merge. The base configuration is not directly observable, but is almost certainly flat. The paste is grit-tempered. Exterior surface treatment is almost exclusively burnished plain.

Straight Rim Bowl

This is a deep bowl with slightly rounded, nearly vertical walls and rim. The vessel base configuration is unknown, but is probably flat. The paste is grit-tem-

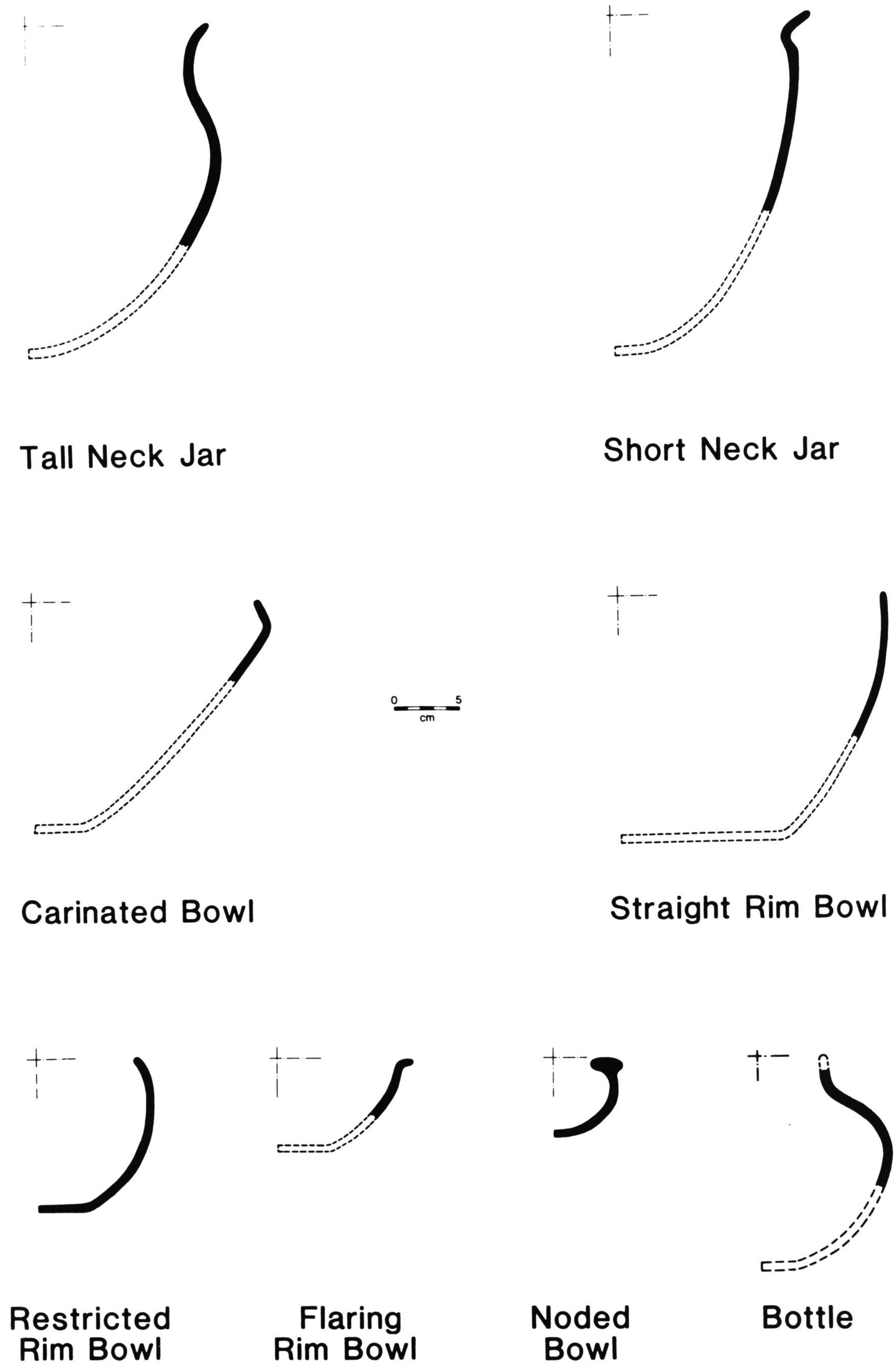

Figure 2. Vessel shape classes of the Beaverdam phase vessel assemblage.

pered. Exterior vessel surfaces are predominantly burnished plain, although plain, check stamped, and complicated stamped treatments also occur.

Restricted Rim Bowl

This is a deep bowl with rounded sides and a restricted rim. Bases are apparently flat and of large diameter relative to maximum body diameter. The paste is grit-tempered. Exterior surfaces are almost exclusively burnished plain.

Flaring Rim Bowl

This is a small rounded bowl with a sharply outflaring rim. Base configuration is not directly observable, but is almost certainly flat. The paste is grit-tempered. Exterior surfaces are burnished plain.

Bottle

This form is represented by only three sherds in the rim sherd sample. Necks are straight and vertical, but quite variable in height and diameter. The vessel body is apparently rounded. The paste is grit-tempered. Exterior surfaces are smudged and burnished.

Noded Bowl

This vessel form is represented by only one specimen in the collection. It is well made, however, and should not be considered merely a unique curiosity. It is a small rounded, grit-tempered vessel with a sharply insloping rim. Large molded and cut nodes have been added to the exterior rim surface. The exterior surface is burnished.

Table 1. Vessel Shape Classes and Their Frequency of Occurrence in the Beaverdam Phase Study Collection.

	Number of whole vessels	*Number of partial vessels*	*Number of rim sherds*
Tall neck jar		1	42
Short neck jar		1	45
Carinated bowl			28
Straight rim bowl			24
Restricted rim bowl	1		16
Flaring rim bowl			4
Bottle			3
Noded bowl	1		

The distribution of orifice diameter measurements for 166 vessels is plotted by shape class in Figure 3. Although the patterns are not as clear as one might hope, there is a tendency for measurements to fall into one or more restricted size ranges for most vessel shapes. Measurements for the flaring rim bowl and the restricted rim bowl have a rather restricted range and appear to be unimodally distributed. Measurements for the tall neck jar, carinated bowl, and straight rim bowl have a much wider range and appear to be multimodal in distribution.

In order to assess the significance of these patterns, the Shapiro-Wilk W statistic (SAS Institute 1979) was utilized to test the null hypothesis that observed orifice measurements are random samples from normally distributed populations. Tests were run on the full sample of measurements for each shape class and on selected sub-samples. The value of W for each test and its probability of occurring, given a normally distributed population, are listed in Table 2. Sub-samples are identified in Figure 4.

The distribution of short neck jar orifice measurements has a high W value, indicating that the sample was drawn from a single normally distributed population. The range of measurements, however, is rather large (30 cm), suggesting that more than one size class is represented. Two sherds have orifice diameters of 34 cm and 38 cm, respectively, well beyond the compact distribution of the remaining 44 specimens. These sherds may represent a distinct size class that was not manufactured or broken with great frequency.

The distributions of restricted rim bowl and flaring rim bowl orifice measurements have high W values, indicating that each sample was drawn from a single normally distributed population. The narrow range of measurements for the flaring rim bowl is further evidence that that vessel shape was manufactured in only one size. Sub-samples of restricted rim bowl measurements also yielded high values of W. Given the test result for the full sample and the relatively small range of the measurements, however, there is no reason to postulate multiple size classes.

In only one case, the carinated bowl, does the W test allow confident rejection of the null hypothesis of sample normality. Not only is the value of W significant at the .01 level, but there is a large gap in the sample distribution (between 30 cm and 34 cm), and the W values indicate that each sub-sample defined by this gap is itself normally distributed.

For the straight rim bowl, W is low, but not sufficiently low that the null hypothesis of sample normality can be rejected. Other evidence, however, indicates that the observations are not drawn from a single population: (1) the range of orifice diameters (34 cm) is quite large; (2) there is a wide gap in the sample distribution between 24 cm and 28 cm; (3) the values of W are substantially higher for all sub-samples except one than they are for the full sample. Based on the shape of the histogram and the sub-sample values of W, it may be plausibly argued that the orifice diameters of the straight rim bowls are distributed in three and possibly four discrete ranges representing an equal number of distinct vessel size classes.

The high value of W for the tall neck jar sample does not permit rejection of the null hypothesis of sample

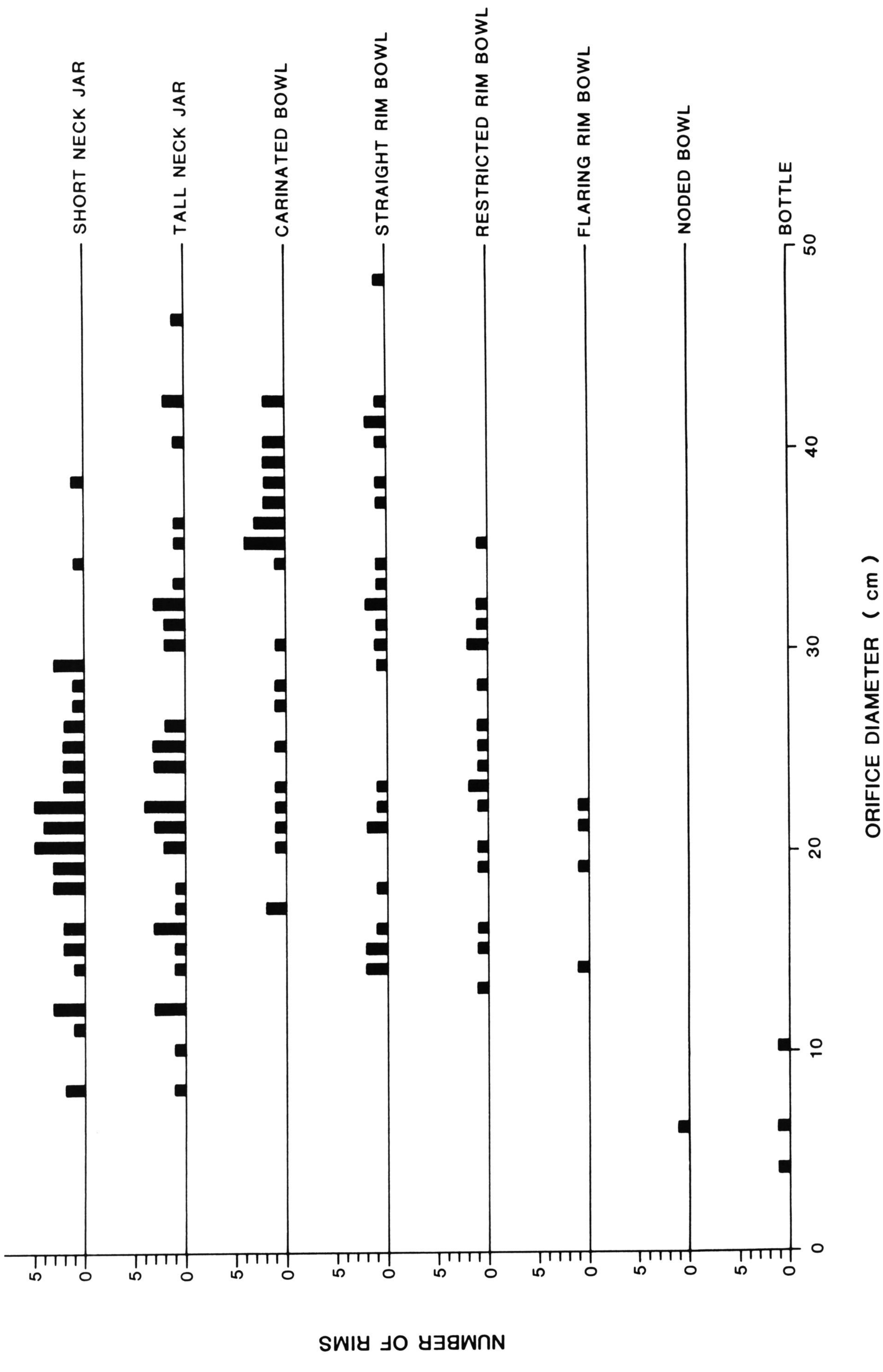

Figure 3. Distribution of orifice diameter measurements by vessel shape class, Beaverdam phase study collection.

normality. As in the case of the straight rim bowl, however, other evidence indicates that sample observations are not drawn from a single normally distributed population: (1) the range of orifice diameters (38 cm) is quite large; (2) there are two gaps in the sample distribution at 26–30 cm and 36–40 cm; (3) several sub-samples have high values of W. Given the overall shape of the histogram and the sub-sample values of W, it can be reasonably argued that the orifice diameters of the tall neck jar are distributed in four discrete ranges representing an equal number of distinct vessel size classes.

The results of the W test runs for the tall neck jar and straight rim bowl are ambiguous and difficult to interpret. At least two factors can be identified as contributing to this situation.

The W test statistic is considered appropriate for detecting deviations from normality that are due to skewness or kurtosis (Shapiro and Wilk 1965). However, the statistic appears to be relatively insensitive to breaks in the sample distribution. This characteristic can be illustrated by making two alterations in the straight rim bowl sample and recalculating W. In one case, deletion of three marginal observations—14 cm, 14 cm, and 15 cm—results in substantially increased values of W (.95931) and P (.492). In the second case, reducing the size of all orifice measurements greater than 28 cm by 5 cm so as to eliminate the gap in observations between 18 cm and 24 cm also results in a substantial increase in W (.95687) and P (.425). What is significant about these tests is that the effect of condensing the entire sample by 15% is less than the effect of deleting a relatively small number (12%) of marginal observations.

The second, and probably most important, factor has to do with the way in which morphological and functional variability is achieved in vessel assemblages. Among pottery-using people today, vessel shapes are often manufactured in multiple, functionally distinct size classes (Hally 1982a). In cases where three or more size classes are made, the middle one is often the most common size class in household usage. One can predict that a random sample of orifice measurements drawn from all size classes in such a situation would tend to resemble a normal distribution. In the case of the carinated bowl, where only two size classes are probably represented, it is likely that the larger size class is the more commonly manufactured and used or broken vessel type; and this is clearly reflected in the low value of W. In the cases of the tall neck jar and straight rim bowl, the greatest density of observations occurs near the middle of the sample range. This may be a reflection of a normally distributed population or it may reflect the existence of a more commonly used and broken middle size class.

Given these considerations and the available orifice diameter data, I feel that the tall neck jar and straight rim bowl samples are best interpreted as reflecting multiple size classes. Accordingly, I propose that each was manufactured in four sizes. These, together with the other morphological vessel types that are believed to constitute the Beaverdam phase vessel assemblage, are listed in Table 3.

Table 2. Value and Probability of W for Sample Distributions of Orifice Diameter Measurements, Beaverdam Phase Study Collection.

	W	P
Tall neck jar	.96709	.392
sub-sample 1	.93980	.478
sub-sample 2	.90979	.099
sub-sample 3	.92840	.060
sub-sample 4	.89337	.241
sub-sample 5	.89478	.387
sub-sample 6	.85116	.025
Short neck jar	.97705	.610
sub-sample 1	.73363	.016
sub-sample 2	.97630	.694
sub-sample 3	.96187	.347
sub-sample 4	.95773	.209
Carinated bowl	.87941	<.01
sub-sample 1	.95080	.687
sub-sample 2	.95470	.696
sub-sample 3	.92536	.208
Straight rim bowl	.93508	.161
sub-sample 1	.86642	.260
sub-sample 2	.86475	.303
sub-sample 3	.86754	.097
sub-sample 4	.97970	.953
sub-sample 5	.91218	.441
sub-sample 6	.88664	.316
sub-sample 7	.93612	.416
Restricted rim bowl	.97559	.875
sub-sample 1	.96427	.554
sub-sample 2	.96283	.808
sub-sample 3	.94738	.673
Flaring rim bowl	.89536	.389

The differential occurrence of soot deposits on vessels confirms the existence of multiple, functionally distinct size classes for specific vessel shapes in the Barnett phase assemblage. Unfortunately, this type of evidence is not helpful in the present case because all size classes of the tall neck jar, carinated bowl, and straight rim bowl are represented by sooted and unsooted rim sherds (Table 3). In fact, all vessel types, except the flaring rim bowl, bottle, and noded bowl are represented by sooted specimens.

The foregoing characterization of Beaverdam phase vessel morphology should be considered preliminary in nature. Analysis of additional whole and partial vessels, when they become available, may result in some modification of the classification. Nevertheless, ethnographic evidence indicates that the characterization is correct in general outline.

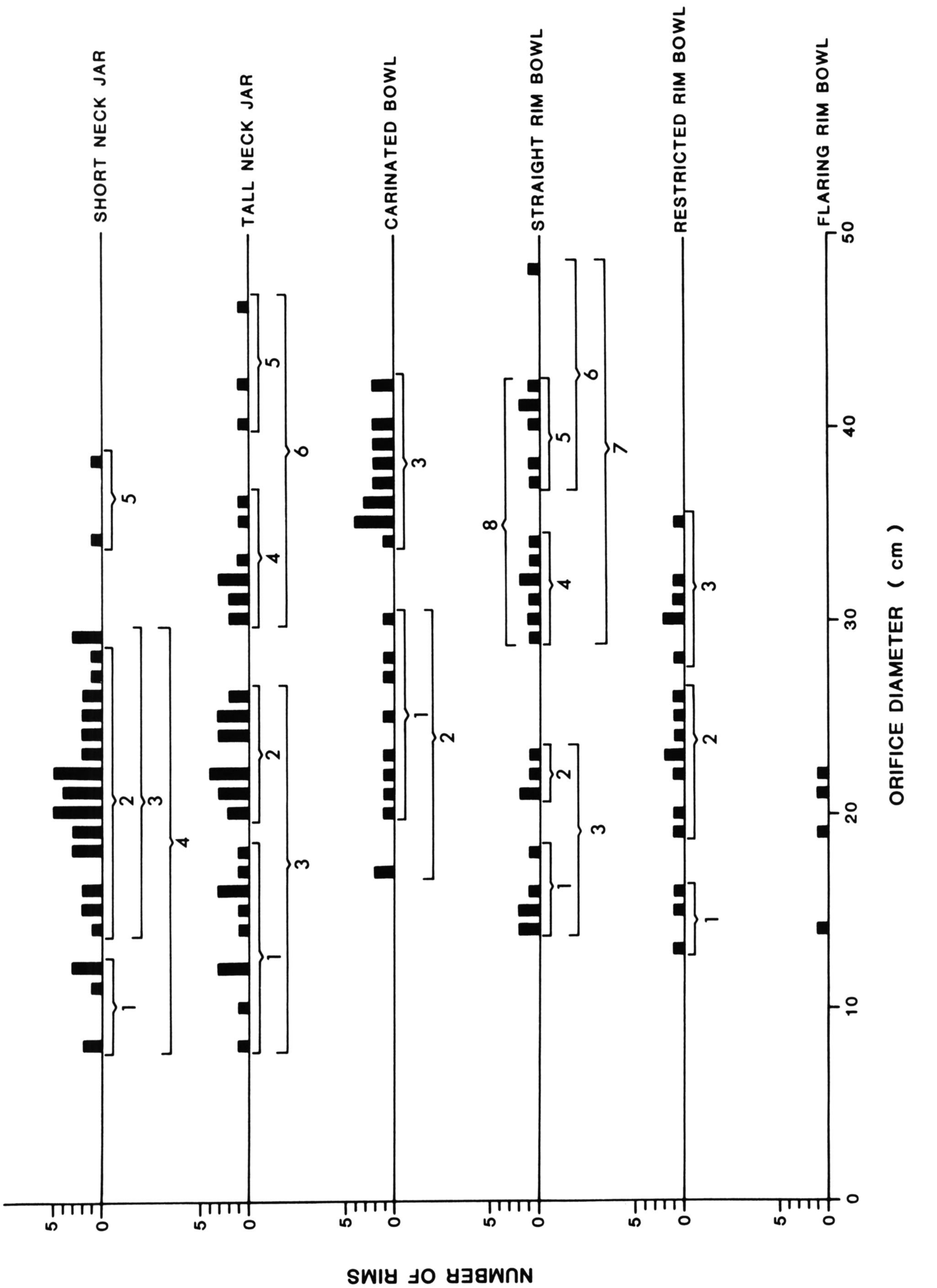

Figure 4. Orifice diameter sub-samples subjected to Shapiro-Wilk W test, Beaverdam phase study collection.

Table 3. Beaverdam Phase Morphological Vessel Types: Frequency, Orifice Diameter Range and Occurrence of Soot Deposits.

	Frequency in Study Collection	*Orifice Diameter Range*	*Number of Sooted Specimens*	*Number of Unsooted Specimens*[a]
Small tall neck jar	12	8–18 cm	8	2
Medium tall neck jar	17	20–26 cm	9	4
Large tall neck jar	10	30–36 cm	5	5
Largest tall neck jar	4	>39 cm	3	
Short neck jar	46	12–28 cm	24	9
Small carinated bowl	10	17–30 cm	4	2
Large carinated bowl	18	34–42 cm	10	3
Small straight rim bowl	6	14–18 cm	2	1
Medium straight rim bowl	4	21–23 cm	2	1
Large straight rim bowl	7	29–34 cm	2	4
Largest straight rim bowl	7	37–42 cm	5	1
Restricted rim bowl	17	13–35 cm	11	6
Flaring rim bowl	4	14–22 cm		4
Bottle	3	4–10 cm		3
Noded bowl	1	6 cm		1

[a]Thirty-five specimens in the rim sherd sample were too small to analyze for soot deposits.

Published ethnographic studies of contemporary pottery-using communities (Conklin 1953; David and Hennig 1972; DeBoer and Lathrap 1979; Fontana *et al.* 1962; Haaland 1978; Longacre 1981; Pastron 1974; Weigand 1969) provide a picture of the nature of morphological variability that is similar to that seen in the Beaverdam phase pottery assemblage. In all thoroughly reported communities with household or part-time specialist pottery production (Hally 1983b), morphological variation is achieved by manufacturing a limited number of vessel shapes and manufacturing some of those in multiple sizes. The morphologically distinct vessel types produced in this way usually have at least partially distinct functions.

The array of morphologically and functionally distinct types of vessels that are recognized and used by the members of a community or society may be termed a full vessel assemblage (Hally 1982a). In ethnographic communities with household or part-time specialist pottery production, the full vessel assemblage usually consists of between four and eight shapes and eight to 14 morphological vessel types. The Beaverdam phase vessel assemblage is similar to these ethnographic assemblages in number of morphological types and in the manner by which morphological variability is achieved. By analogy, we may assume that most, if not all, Beaverdam phase vessel types were also functionally distinct.

The Barnett Phase Vessel Assemblage

The Barnett phase vessel assemblage consists of eight shape classes (Fig. 5).

Pinched Rim Jar

This vessel form is characterized by a globular body, a rounded base, a constricted neck, and an outflaring thickened rim. The paste is grit-tempered, and exterior surfaces are roughened, usually by complicated stamping.

Mississippian Jar

This vessel form is characterized by a globular body, a rounded base, a constricted neck, and a vertical or insloping rim. Handles extend from the rim to the vessel body. The paste is usually shell-tempered, and incised decoration frequently occurs on the vessel neck or shoulder.

Carinated Jar

This is a barrel shaped vessel with a flat base and convex sides. There is usually a slight break in the profile where the lower and upper walls merge. The paste is grit-tempered, and incised decoration occurs on the upper vessel wall.

Carinated Bowl

This is a deep bowl with a flat base, an insloping rim, and a pronounced break in the profile where the lower and upper walls merge. The paste is grit-tempered, although shell is sometimes added. Incised decoration occurs on the upper wall.

Rounded Bowl

This vessel form manifests considerable morpho-

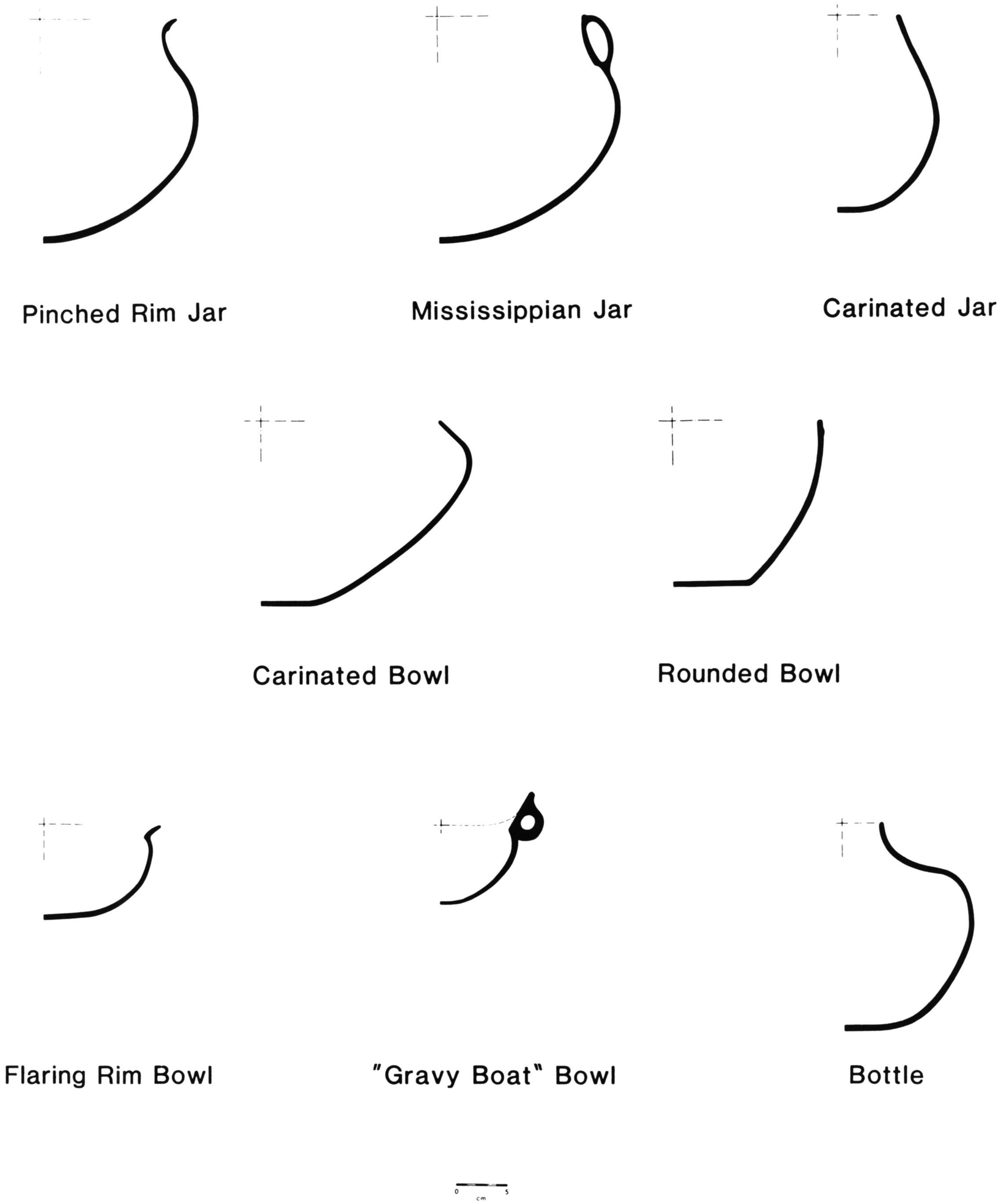

Figure 5. Vessel shape classes of the Barnett phase vessel assemblage.

logical and material variability. Bases are usually flat, but may be rounded. Sides are round and rims are vertical or insloping. The paste is usually grit-tempered, but is occasionally shell-tempered. Modeled decoration sometimes occurs on the vessel exterior.

Flaring Rim Bowl

This is a small bowl with a flat base, rounded sides, and an outflaring rim. The paste is grit-tempered, although shell is sometimes added. The interior rim surface is usually decorated with incised designs.

Bottle

This form is characterized by a globular body, a flat base, a small orifice, and a short neck with a vertical or insloping rim. The paste is either grit-tempered or shell-tempered. Exterior surfaces are plain and may be smudged and burnished.

"Gravy Boat" Bowl

This is a small, slightly oval bowl with a flat base, rounded sides, and large flanges with handles at each end. The paste is grit-tempered. Applique nodes occur on the rim or over the entire upper portion of the exterior vessel surface.

In earlier papers (Hally 1982a, 1983b) I characterized the Barnett phase vessel assemblage as consisting of 13 morphological vessel types. Testing of the orifice diameter data with the W and Kolmogorov-Smirnov D (D'Agostina 1971)—used when sample size >50—routines in the SAS statistical package (SAS Institute 1979), however, indicates that there are more size classes than were previously identified and that the number of morphological vessel types is closer to 17.

The flaring rim bowl, carinated jar, and "gravy boat" bowl were each manufactured in a single size. For the flaring rim bowl, W is high and the range of orifice measurements is relatively narrow (Fig. 6, Table 4). Only two "gravy boat" bowl specimens exist in the Barnett phase study collection, but their dimensions (7 cm and 13 cm) are closely matched by specimens reported from other late Mississippian sites in Georgia, Alabama, and Tennessee (Ball *et al.* 1976: Fig. 9; Kneberg 1952: Fig. 109; Little and Curren 1981: Plate 2; Moore 1915: Figs. 25, 31–34, 42; Webb 1939: Plate 65; Webb and DeJarnette 1942: Plate 261). The carinated jar is represented by only two specimens (10 cm and 10 cm) in the study collection, but specimens from the late Lamar Tugalo site (Williams and Branch 1978) in northeast Georgia have similar dimensions (Gwyneth Duncan, personal communication 1984).

The low values of D for the carinated bowl and Mississippian jar permit rejection of the null hypothesis of sample normality for these vessel forms. The shape of the measurement histograms and sub-sample values of W indicate that the former was manufactured in three sizes and the latter in four. The large number of small Mississippian jar specimens in the sample reflects the fact that vessels of this size are frequently placed in burials. The reason for the extreme negative skewness of this sub-sample is not known. The high frequency of sooting in this class relative to that of the larger size classes, however, supports its recognition as a functionally distinct vessel type (Hally 1983a).

Table 4. Value and Probability of W and D for Sample Distributions of Orifice Diameter Measurements, Barnett Phase Study Collection.

	W	D	P
Pinched Rim Jar		.08878	>.15
sub-sample 1	.94294		.499
sub-sample 2	.93902		.512
sub-sample 3	.95909		.478
sub-sample 4	.96458		.464
sub-sample 5	.89155		.271
sub-sample 6	.84484		.055
sub-sample 7	.77408		<.01
Mississippian Jar		.21890	<.01
sub-sample 1	.89433		<.01
sub-sample 2	.90043		.377
sub-sample 3	.92340		.396
sub-sample 4	.90259		.087
sub-sample 5	.91764		.451
sub-sample 6	.92067		.082
Carinated bowl		.16313	<.01
sub-sample 1	.96276		.807
sub-sample 2	.89183		.232
sub-sample 3	.88662		.036
sub-sample 4	.94969		.202
sub-sample 5	.81394		.084
sub-sample 6	.95180		.148
Rounded bowl	.95272		.249
sub-sample 1	.87084		.277
sub-sample 2	.85873		.042
sub-sample 3	.95079		.512
sub-sample 4	.92883		.070
Flaring Rim bowl	.97539		.871

The value of D for the pinched rim jar sample is low, but not below the .05 level of significance. The shape of the measurement histogram and the high values of W for sub-samples, however, indicate that four size classes are represented. The low value of W for the largest size class reflects in part the two specimens with orifice diameters greater than 45 cm. These observations may be in error because large diameter sherds are more difficult to measure accurately. The differential occurrence of sooting and interior pitting indicate that at least three of the pinched rim jar size classes are functionally distinct (Hally 1983a).

The value of W for the rounded bowl sample indicates that this shape was manufactured in one size.

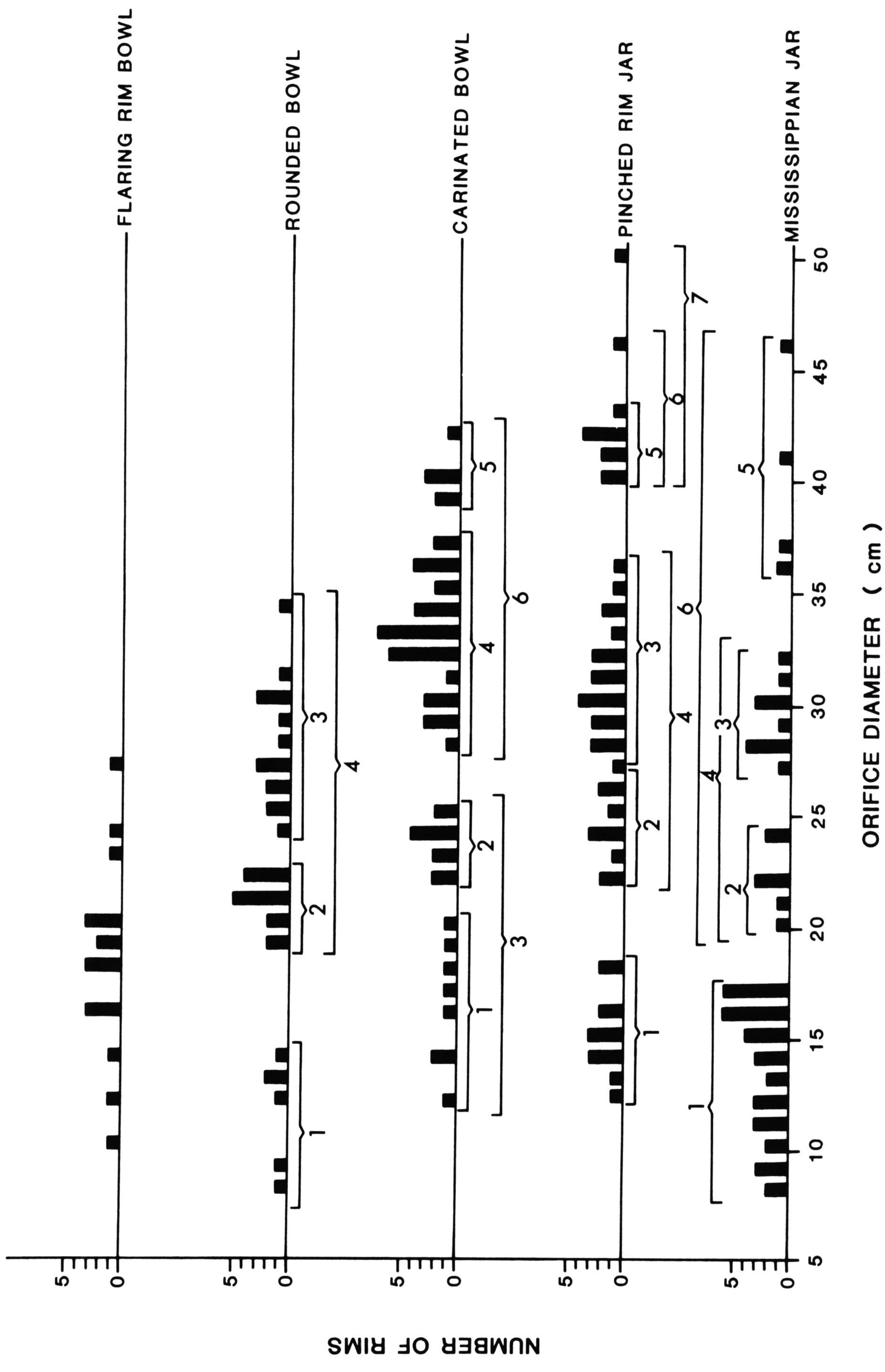

Figure 6. Orifice diameter sub-samples subjected to Shapiro-Wilk W test, Barnett phase study collection.

However, the gap in the measurement distribution between 14 cm and 19 cm and the high values of W for two sub-samples indicates that two and possibly three distinct sizes are represented.

There is not sufficient information on size variability in bottles to allow identification of size classes in this vessel form.

Comparison of the Barnett and Beaverdam Phase Vessel Assemblages

The Beaverdam and Barnett phase vessel assemblages may be considered elements of a single ceramic tradition; Beaverdam phase is chronologically and developmentally antecedent to Lamar culture while Barnett phase represents a late variety of that culture. Stylistic, formal, and functional similarities can therefore be expected to exist between the two assemblages on the basis of common heritage alone. On the other hand, the two assemblages are separated in space by approximately 250 km and in time by approximately 200 years. Differences can therefore be expected to exist between them as well.

The two vessel assemblages manifest considerable morphological similarity. At least four vessel shapes—pinched rim jar/tall neck jar, carinated bowl, flaring rim bowl, and bottle—appear to be common to both (Fig. 7). Comparison of orifice diameter measurements using the T test statistic (Blalock 1972) indicates that as many as eight size classes are also shared (Fig. 8, Table 5).

The pinched rim jar and tall neck jar have similar upper body profiles, and it is reasonable to assume that they are similar in the basal area as well. The two forms are also similar in having complicated stamped surface treatment. The value of T obtained for each pair of size classes is low, indicating that the two vessel forms were manufactured in similar size classes. The three smaller size classes are similar in having exterior soot deposits.

Differences between the two vessel forms are relatively minor. The pinched rim jar is distinct in having a thickened rim, while the tall neck jar differs in having corn cob impressions in the neck area. The largest size class of pinched rim jar is not sooted; its Beaverdam phase counterpart is.

Flaring rim bowls in both assemblages are similar in rim configuration, orifice diameter, and absence of exterior sooting. There is no reason to believe that the Beaverdam phase type does not also have a flat bottom. The two types differ primarily in the fact that Barnett phase specimens have incised decorations on their rims, while Beaverdam phase specimens have plain rims.

The carinated bowl forms in both assemblages are characterized by a straight insloping rim and a break in the vessel profile where the upper body wall and lower body wall join. The two forms differ only in width of the upper wall and the presence of incised decoration on the Barnett phase vessel types. Carinated bowls from the early Lamar component at the Dyar site in north central Georgia (Smith 1981) closely resemble those in the Beaverdam assemblage in having narrow, undecorated upper walls. They have flat bases, suggesting that the Beaverdam form does also.

Despite these shape similarities, the two vessel forms appear to have been manufactured in different sizes: three in the Barnett phase form and two in the Beaverdam phase form. Except for the Barnett medium carinated bowl and the Beaverdam small carinated bowl, these classes differ significantly in size from one another (Table 5). Nevertheless, it is probably of functional significance that the largest size class is the most common in both assemblages, accounting for 69% of all Barnett phase carinated bowl specimens and 64% of all Beaverdam phase carinated bowl specimens.

The rounded bowl is represented in the Barnett phase study collection by a small number of whole and partial specimens, and these manifest considerable morphological variability. As more information becomes available, the class may have to be subdivided into two distinct shape classes: one characterized by a straight, vertical rim and the other by a curved insloping rim. Such a distinction would parallel that between the straight rim bowl and restricted rim bowl in the Beaverdam assemblage.

All three vessel forms are similar in having smooth or burnished surfaces, applique nodes below the rim, and exterior soot deposits. Bases are probably typically flat in each as well. Size classes differ considerably among the three forms, the straight rim bowl having four, the rounded bowl three, and the restricted rim bowl one. Comparison of orifice measurements indicates that only the medium rounded bowl and medium straight rim bowl are similar in size.

Not enough is known about the bottle form in either assemblage to allow detailed comparison. Orifice diameter appears to be similar, and exterior surfaces are typically black smudged and burnished. Also, the form is very uncommon in both assemblages.

The remaining vessel shape classes do not have morphological counterparts. The Barnett phase carinated jar resembles the restricted rim bowl to some extent, but differs in being considerably deeper and in having a smaller orifice. The "gravy boat" bowl and noded bowl resemble each other in having large nodes placed on the exterior surface below the rim, but otherwise differ greatly in shape and size. The Mississippian jar and short neck jar differ from one another in temper, overall shape, rim form, appendages, surface treatment, and size classes.

How are we to explain the morphological similarities that exist between the two assemblages? Most, I believe, can be attributed to similarities in the way

Table 5. T Test Comparison of Orifice Diameter Distributions for Selected Beaverdam and Barnett Phase Vessel Types.

Barnett phase vessel types	*Beaverdam phase vessel types*	*T*	*Degrees of freedom*	*P*
Pinched rim jar	Tall neck jar			
small	small	1.142	22	.20
medium	medium	1.767	25	.10
large	large	1.516	30	.10
largest	largest	0.076	13	.20
Carinated bowl	Carinated bowl			
small	small	3.725	16	.01
medium	small	0.412	18	.20
large	large	3.971	56	.001
Rounded bowl	Straight rim bowl			
small	small	3.285	10	.01
medium	medium	1.509	15	.20
large	large	3.236	20	.01
Flaring rim bowl	Flaring rim bowl	0.319	19	.20
Bottle	Bottle	0.585	3	.20

pottery vessels were used in each phase. Generally speaking, vessel form is determined primarily by vessel usage and vessel usage is determined primarily by the manner in which food is prepared, stored, and consumed. Ethnohistorical evidence demonstrates that aboriginal food preparation, storage, and consumption practices were quite uniform throughout the southeastern United States at the time of European contact (Hally 1982b; Swanton 1946). Presumably pottery vessel usages were as well.

I have described aboriginal Southeastern food habits in detail elsewhere (Hally 1982b). Those relevant to the present paper may be summarized as follows:

1. Most foodstuffs were prepared by boiling and were combined to form soups and stews.
2. Soups and stews were made with broths derived from animal flesh, nuts, or oily seeds and had lye processed maize (hominy) as a major ingredient. ingredient.
3. Many foodstuffs required extensive boiling or soaking and rinsing to make them palatable.
4. Roasting of animal flesh was another important cooking technique, while frying, pan broiling, baking, and parching were of relatively minor importance.
5. Lye-processed maize was the single most important foodstuff in the native diet. It was consumed in stews, fermented soup, bread, and as parched kernels.
6. Oil derived from animal flesh, nuts, and oily seeds was an important ingredient in many foods. It was added to cooked and uncooked vegetables and was used as a sauce in which food was dipped at the time of eating.
7. Most food staples were liquid in consistency, were consumed at irregular intervals over a period of time, and were eaten with a large spoon from a communal vessel.
8. Drinking water was stored in and drunk from gourds.
9. Foodstuffs were prepared for storage by parboiling, parching, drying, smoking, and clarifying.
10. Most dry foodstuffs were stored in granaries and baskets. Pottery vessels were used primarily to store water and oil.

Hypotheses concerning the function of Barnett phase vessel types have been presented elsewhere (Hally 1982b). They were developed through analysis of the physical properties and mechanical performance characteristics of vessel types and enthnographic information on southeastern Indian food habits. They may be summarized as follows:

1. The largest pinched rim jar was used for long-term storage of liquids such as bear oil, fermented corn soup, and water.
2. The small, medium, and large pinched rim jars were used primarily to boil a variety of foodstuffs, including hominy, corn soup, animal flesh, and vegetables, such as greens and squash. Different vessel sizes were used, depending upon the type and quantity of foodstuff being prepared.
3. The Mississippian jar vessel types were used much like the pinched rim jars to cook varying quantities of foodstuffs. The vessel type is better suited for cooking foodstuffs that require long cooking times, high temperatures, or regulated low temperatures than is the pinched rim jar. It may, as a result, have had greater use in parching, boiling foodstuffs such as whole kernel maize and beans, and rendering bear fat.
4. The carinated jar was used for short-term storage and serving small quantities of non-staple liquid foods.

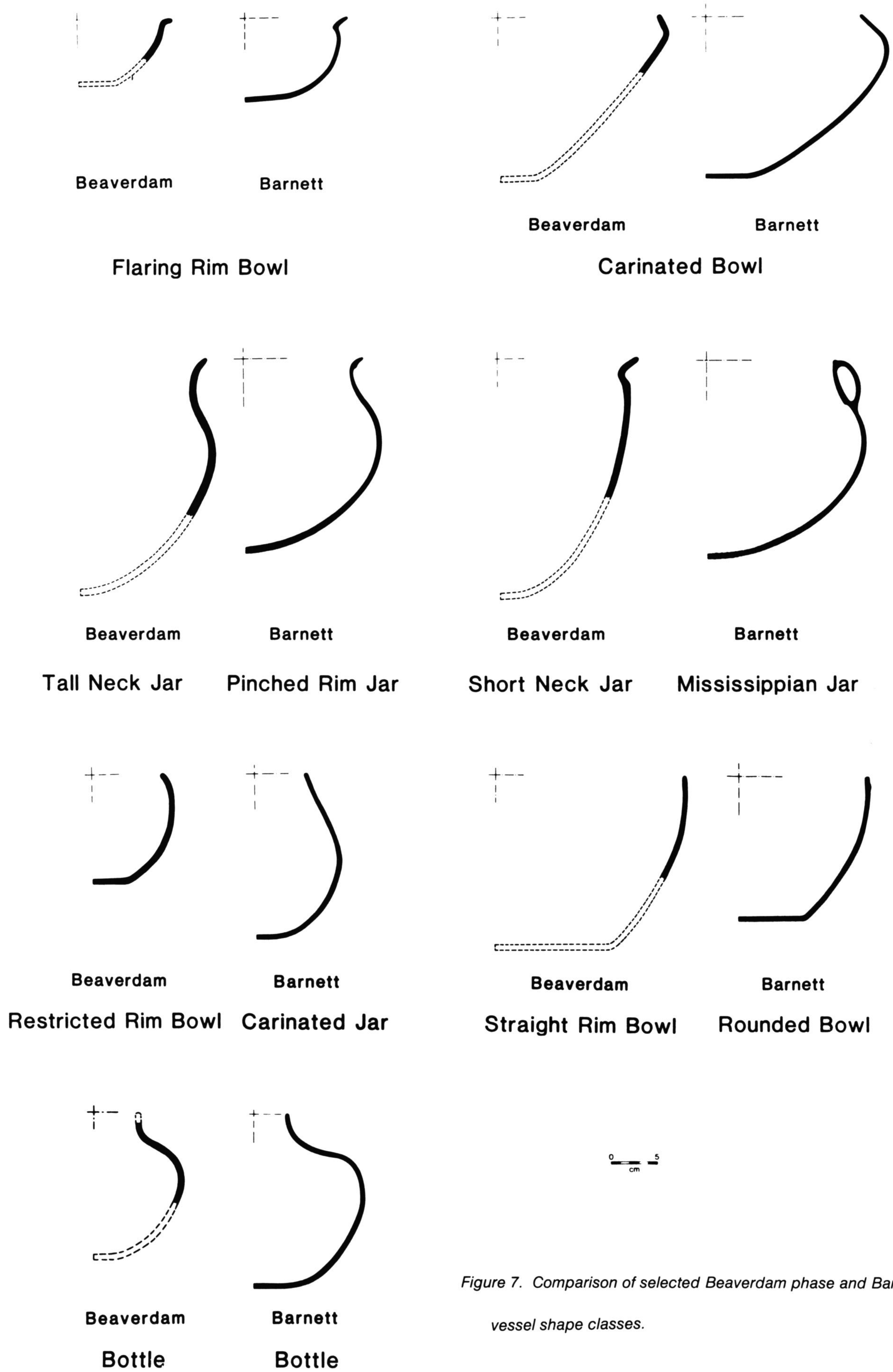

Figure 7. Comparison of selected Beaverdam phase and Barnett phase vessel shape classes.

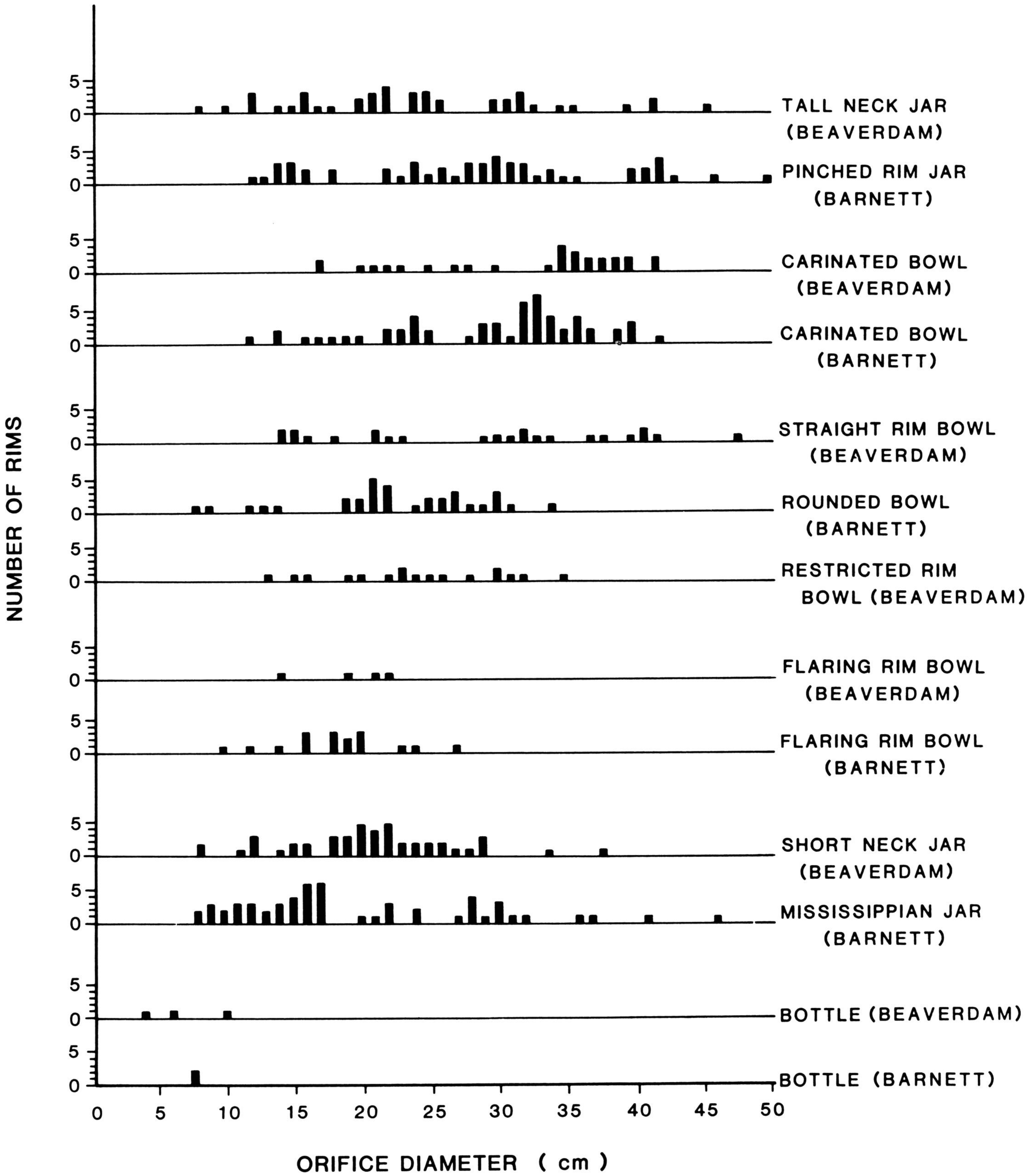

Figure 8. Comparison of Beaverdam phase and Barnett phase orifice diameter measurement distributions.

5. The small, medium, and large carinated bowls were used primarily to heat and serve foods such as soup, stew, and spoonmeat, which either required little cooking or had been previously cooked in different vessel types. Different vessel sizes were used depending upon the type and quantity of food being prepared.

6. The rounded bowl vessel types were used primarily to manipulate (stir, beat, mold, etc.) varying quanities of solid and viscous food and non-food materials.

7. The flaring rim bowl was used to serve small quantities of liquid and solid food such as fresh fruit, nut meal, and bear oil.

8. The bottle was used for holding and transporting liquids and small size solid objects.

9. The "gravy boat" bowl was used to hold and transport fire, primarily in ritual contexts.

The Beaverdam phase vessel types have not been subjected to a thorough functional analysis, but there is no reason to believe that individual types would not have been used in the same manner as their Barnett phase morphological counterparts. The tall neck jar vessel types, with one exception, were probably used in the same way as the pinched rim jars. The occurrence of soot deposits on specimens of the largest tall neck jar class indicates that this vessel type, unlike its Barnett phase counterpart, was used for cooking as well as storage. Although the two carinated bowl forms differ with respect to size classes, it is quite likely that they had similar functions. The high frequency of occurrence of the large carinated bowl in the Barnett phase assemblage is believed to reflect the important role of the vessel type in serving soups and stews. The high frequency of the large carinated bowl in the Beaverdam assemblage may reflect a similar role. In both assemblages, the infrequency of small sized bowls that might have served as individual eating bowls supports this use identification for the large carinated bowl. Assuming that the Beaverdam phase flaring rim bowl has a flat base, it would have functioned well as a serving bowl like its Barnett phase counterpart.

The rounded bowl in the Barnett phase and the Beaverdam phase straight rim and restricted rim bowls exhibit sufficient morphological similarity that they could very well be functional counterparts. Size classes do not compare well, but this may in part reflect the fact that Barnett phase vessels with vertical and restricted rims are contained in the single rounded bowl shape class. The size ranges of the three shape classes are roughly similar with the exception of the largest straight rim bowl, there being nothing comparable to this vessel type in the Barnett phase assemblage.

Although little is known about shape and size variability in the bottle shape class in each assemblage, shared features such as orifice size and surface treatment indicate a common function. The infrequency of pottery bottles in both assemblages is probably a reflection of the southeastern Indian's preference for gourds as drinking water containers. Pottery bottles may have been used primarily to hold prepared drinks such as sassafras tea.

The short neck jar and Mississippian jar are quite dissimilar in form and size and seem unlikely to have had similar uses in the past. Yet each has a restricted orifice, each is commonly sooted, and each has roughly the same range of orifice diameters. Assuming that the short neck jar also has a rounded base, each vessel form would have been mechanically well suited for use over a fire.

The "gravy boat" bowl and noded bowl are probably not functionally equivalent vessel forms. The low frequency with which each of these vessel types and the carinated jar occur in the two study collections suggests that they were not used in common everyday household activities. Sampling error may account for the absence of morphological counterparts in each assemblage.

Conclusions

Fifteen morphological vessel types have been distinguished in the rim sherd collection from the Beaverdam Creek site. These vessel types differ in many details of surface decoration and rim form from the 17 vessel types that constitute the Barnett phase assemblage. Such differences can be expected between assemblages separated in time and space, as these were. On the other hand, the two assemblages show remarkable similarities in number of vessel types, vessel type morphology, and the relative frequency with which specific vessel types are represented in each assemblage. Both assemblages have:

1. Two jar forms that were made in multiple sizes and were used over fire.

2. A carinated bowl that was used over fire and was made in multiple sizes, the largest of which was quite common.

3. A small flaring rim bowl that was not used over fire.

4. Straight and restricted rim bowl forms that, with one exception, were made in multiple sizes.

5. A bottle form that was not common and was not used over fire.

Ethnographic evidence strongly suggests that aboriginal food habits and therefore vessel usage patterns were quite uniform throughout the southeastern United States in the 17th and 18th centuries. Given their broad geographical distribution, they are likely to have considerable antiquity as well. I argue, in fact, that most food habits and vessel usage patterns extend back in time at least to the appearance of intensive maize agriculture around A.D. 900, and possibly much further (Linton 1924). If I am correct, we can expect to find a great deal of morphological uniformity among Mississippian vessel assemblages throughout the Southeast. At the least, we can expect to find that most Mississippian vessel assemblages will have the following basic characteristics:

1. A large jar for storage of liquid foods.
2. At least one jar form for heavy duty cooking.
3. A large vessel, presumably a bowl, for heating and serving liquid foods.
4. Numerical unimportance of pottery bottles and individual eating bowls.

The Barnett and Beaverdam phase vessel assemblages conform to these expectations and suggest that three additional features may be common to most Mississippian vessel assemblages:

1. Use of at least two physically distinct jar forms for heavy duty cooking.
2. Use of at least three physically distinct bowl forms.
3. Manufacture of some vessel shapes in multiple size classes.

These predictions, of course, can be tested as additional Mississippian vessel assemblages are defined through morphological analysis.

NOTE ON CURATION

Materials discussed in this paper are currently curated at the University of Georgia. The Beaverdam Creek materials will be stored permanently at a curatorial repository to be named by the National Park Service later this year.

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