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A MORPHOLOGICAL ANALYSIS OF THE TUGALO PHASE VESSEL ASSEMBLAGE

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Athens

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THE TUGALO PHASE VESSEL ASSEMBLAGE

by

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Ethnographic studies demonstrate that communities of people which make and use pottery have a limited number of vessel forms that are morphologically, physically and functionally distinct. Ethnographic studies furthermore demonstrate that people use vessels primarily for the preparation, storage and consumption of food. It stands to reason, therefore, that the assemblage of vessel forms manufactured and used in a community reflect to a large extent the food habits of the community.

Based on the ethnohistorical literature, Hally (1984) has suggested that aboriginal food habits were fairly uniform throughout the Southeastern United States during the seventeenth and eighteenth centuries. Hally has suggested, furthermore, that this uniformity probably has considerable time depth, extending back at least until the beginning of the Mississippian period around A.D. 1000. If food habits were generally similar across the Southeast in aboriginal times, we can expect a certain degree of uniformity in the types of vessel forms that were manufactured and used throughout the region. This thesis is an initial attempt to test this hypothesis.

Working with Mississippian period collections of pottery from Northwest Georgia, Hally (1982, 1983) has identified what he believes to be the full array of vessel types which were manufactured and used during the sixteenth century Barnett phase. Using physical and morphological evidence, Hally has been able to suggest distinct vessel uses for each of the vessel types recognized in the Barnett phase assemblage. It is reasonable to argue that if similar food habits are reflected in similar vessel types, and if food habits were similar throughout the Southeast, then the vessel assemblages of late prehistoric communities elsewhere in the Southeast should be generally similar to that of the Barnett phase.

In order to test this hypothesis, a ceramic collection from the Tugalo site, located in Northeast Georgia, was analyzed morphologically and compared with the Barnett phase vessel assemblage. This collection was chosen for analysis for the following reasons. First, the size of the collection, in terms of numbers of sherds, was very large and would yield a large sample size for analysis. Second, the majority of sherds in the collection had been washed and cataloged prior to the present analysis. Much of the possible vessel reconstruction had been done at that time as well. Third, the collection is contemporaneous with the Barnett phase (A.D. 1450-1600). As a result, the possibility that differences between the assemblages could be accounted for due to change through time is eliminated.

The Tugalo pottery proved to be sufficiently dissimilar, stylistically, from other contemporaneous phases in the region to warrant establishing a separate Tugalo phase. However, the Tugalo and Barnett phases are part of the same ceramic tradition which archaeologists refer to as Lamar. Since there is such a relatively close spatial proximity between the phases, similarities in their vessel assemblages may be attributed to this common cultural tradition. This is considered to be one disadvantage in using the Tugalo collection for this study.

This thesis is a morphological analysis of vessels and has not attempted to identify the function of each of the vessel types recognized in the Tugalo collection. The assumption is made that similar vessel form indicates similar vessel function. In order to test the hypothesis that similar food habits in the Southeast should reflect similar vessel types, a functional analysis is unnecessary. The morphological vessel types identified here, however, provide the basis for future formal and functional analyses.

The organization of this paper is as follows. Chapter 2 reviews the different approaches archaeologists have used to investigate ceramic vessel form and function. Chapter 3 presents a description of the Tugalo site and its archaeological investigations especially with regard to the "Northeast Dump" feature which yielded the study collection. Methods used in the analysis of the study collection are presented in Chapter 4. The Tugalo phase vessel assemblage is described in Chapter 5 and the Barnett phase vessel assemblage is described in Chapter 6. Chapter 7 provides detailed comparisons of the two assemblages. The results of this study are summarized in Chapter 8.

CHAPTER 2

THEORETICAL FRAMEWORK

Morphological investigations of ceramic vessels are progressing along 3 fronts: ethnoarchaeological, technological, and functional (Hally 1984:46). Although these 3 approaches differ in their methods of research their goals are similar: to show that pottery is an important source of information about past human behavior. Using these approaches, archaeologists have the potential not only to recognize the basic vessel forms present in an assemblage, but to understand how such forms relate to vessel function (Henrickson and McDonald 1983; Hally 1984, 1985), site use, and even duration of site occupation (Dickens and Chapman 1978; Shapiro 1983).

Ethnoarchaeological investigations of pottery-making and -using communities provide archaeologists with information concerning vessel form and use, the nature of vessel assemblages, manufacturing techniques, and patterns of vessel breakage and discard. Ethnoarchaeological studies which pertain to this thesis are those which focus on relationships between vessel form and function.

The term "function" refers to the way in which a vessel is used to perform a task. These tasks may include boiling meat or parching corn for example. Henrickson and McDonald (1983) point out that, until recently, few ethnographers focused on a formal/functional approach to ceramics. An early work by Linton (1944), in which information was presented on the morphological characteristics of cooking pots, is one of the first functionally-oriented studies. He attempted to show how formal attributes of cooking pots relate to their mechanical performance characteristics; that is the operating effectiveness of the pots under various working conditions (Braun 1983). For example, Linton (1944) found that cooking pots tend to be tall relative to their base size and tend to have gently, outward-sloping vessel walls. These characteristics are most effective in the transfer of heat along a lateral surface. Morphological characteristics such as these, along with physical properties such as paste and temper, have an affect on the mechanical performances of vessels.

Recent progress by archaeologists in the investigation of formal and functional relationships of vessels can be largely attributed to ethnographic information obtained from communities which still make and use pottery (David and Hennig 1972; DeBoer and Lathrap 1979; Longacre 1981). From the ethnographic literature, it has been observed that pottery-making and -using groups classify vessels according to function. The Shipibo-Conibo, of the Upper Amazon region of Peru (DeBoer and Lathrap 1979:105), recognize two functionally distinct classes of vessels. These classes are based on cooking activities, or more specifically use over fire, and non-cooking activities. The Kalinga (Longacre 1981), located in the Philippines, also have a native classification system of pottery based on projected vessel use. Significant shape differences were found by Longacre (1981) to relate to functional differences, again, primarily between cooking and non-cooking vessels. Comparisons of measurements of rim angles, orifice diameters, and vessel heights, by Longacre, quantifiably substantiate the Kalinga taxonomic differentiations between these two basic functional classes of vessels.

In ceramic vessel research, vessel shape can be considered the most important morphological attribute relevent to function. Potters control many mechanical performance characteristics of pots by manipulating vessel shape (Braun 1983). Hally (1982) has noted, however, that most contemporary pottery-making groups manufacture a limited number of vessel shapes ranging between 3 and 11. Potters achieve additional morphological variability through manufacturing some vessel shapes in multiple sizes. An excellent example concerns the Fulani of North Cameroon which manufacture one jar form in five separate size classes (David and Hennig 1972). These shape/size combinations of vessels, or morphological vessel types, were found by Hally (1982) to range between 8 and 14 types in the ethnographic vessel assemblages examined.

From an extensive review of the ethnographic literature, Henrickson and McDonald (1983) have concluded that:

> "Ceramic vessels are indeed designed within limits of size and form in order to perform a certain general function, and those morphological parameters in turn may be determined by practical considerations of vessel stability, durability, and functional efficiency and convenience."

This conclusive statement pertains to the technological approach to ceramic investigations. Technological studies are directed toward determining how specific morphological and physical properties of vessels relate to, and affect, vessel performance. Technological studies proceed from two premises: 1) that native potters are aware that various properties affect the functional efficiency of vessels, and 2) potters design vessels with different combinations of properties depending on their intended function. These properties, then, should be identifiable to archaeologists as well. In a precedent-setting study by Ericson et al. (1972), relationships were suggested between several morphological and physical properties and vessel function. These properties include: overall vessel shape; ease of access determined by orifice shape and diameter; and paste and temper compositions as they affect vessel wall density and porosity.

Archaeologists, using a technological approach to ceramics, have been able to build on these suggested relationships. For example, in a study with the Shipibo-

Conibo (DeBoer and Lathrap 1979), it was observed that potters choose from various combinations of clays and tempers depending on whether a vessel is to be used over fire. In a technological study by Steponaitis (1983), physical properties of paste and temper composition were tested and found to relate to vessel function. Coarse shell tempering was found to be more efficient in diffusing heat evenly through a vessel than fine shell, thus reducing breakage due to thermal shock. Therefore, coarse shell, rather than fine shell, tempering could be expected to occur more often with cooking vessels.

Braun (1980) has conducted several investigations which have focused on the relationship between morphological properties and vessel function. He has examined mechanical performance characteristics as they relate to thermal shock. Using vessels from the Woodland period (ca. 600 B.C-A.D. 900), Braun noted a decrease in vessel wall thickness over time. He has attributed this phenomenon to an increase in boiling as a food preparation technique. Vessels which are used for boiling need to conduct heat effectively while at the same time withstanding sudden and extreme temperature changes. Thinner vessel walls are more suited for these mechanical performances.

Braun has further hypothesized that orifice diameter reflects intended frequency of access and containment security. The more constricted an orifice, the less accessible are its contents. The importance of this type of study is that it illustrates the value of rim sherds in identifying vessel function.

The functional approach to ceramics is the most recent of the three approaches. Functional studies attempt to identify specific vessel functions for specific vessel forms. This approach uses information from both archaeological and ethnographic contexts. Combining such information with technological research, the archaeologist is able to develop hypotheses concerning specific vessel types and their intended uses.

Henrickson and McDonald (1983) were able to recognize functionally distinct vessel types from vessel assemblages obtained from two Iranian archaeological sites. After the vessel assemblages characteristic of each site were identified, they were able to state hypotheses about potential vessel use based on an extensive review of the ethnographic literature together with contextual data. Lischka (1978), working with ceramics from Guatemala, emphasizes the importance of spatial distributions of ceramics as an aid in recognizing vessel function. From two Mississippian period sites in North Georgia, Hally (1982, 1983, 1984) has been able to identify functionally distinct vessel types based on morphological and physical properties, ethnograhic information, contextual data, and use-wear patterns on vessel surfaces.

There have been several functional studies with ceramic collections from the Late Mississippian period in the

Southeast. The study on which this thesis is based will be examined in greater detail in Chapter 6 and involves ceramics from the Little Egypt site (9Mu102) in Northwest Georgia (Hally 1978). From this ceramic collection, a full vessel assemblage was established for the Barnett phase and, ultimately, functionally distinct vessel types were recognized. With ceramics from the Joe Bell site in Central Georgia, Williams (1982) used the statistical method of cluster analysis to group vessels according to various morphological and physical attributes. Using vessels from sites located in the Oconee River basin in central Georgia, Shapiro (1983) has suggested site use and duration of site occupation. These suggestions are based on the premise that morphological and physical properties of vessels indicate vessel use. A similar study of site use and occupation was performed with ceramics from two late Historic Creek sites in Alabama (Dickens and Chapman 1978). Based on vessel types, a distinction was made between long-term and short-term site occupations.

A recent morphological study of ceramics (Hally (1984) concerns a somewhat earlier, but spatially closer, site in Northeast Georgia. The Beaverdam Creek site (9Eb85), an Early Mississippian period site, has yielded ceramics from which the full vessel assemblage has been identified. The vessel types identified for the Beaverdam phase were found to be morphologically similar to vessel types in the Barnett phase.

In summary, Braun (1983:108) suggests that ceramic vessels are tools. In other words, ceramic vessels are made to perform certain tasks. Hally (1983) has learned from the ethnographic literature that potters do not randomly design vessels, but manufacture vessels in a limited number of shapes. In order to achieve greater functional variability, these limited number of shapes are manufactured in multiple sizes.

Ethnographic studies also show that native potters are aware of certain morphological and physical properties which maximize functional efficiency of vessels. Potters use this knowledge to manufacture vessels which are designed to have a distinct set, or range, of uses. Morphological vessel types which result from such shape and size decisions depend upon intended vessel use.

This thesis, then, is based on the following premises:

1) pottery-making and -using communities manufacture a limited number of vessel shapes in multiple sizes;

2) formally distinct vessels are also functionally distinct;

3) morphological characteristics which set vessel shape and size classes apart should be identifiable to the archaeologist;

4) morphological and physical properties which determine the mechanical performance characteristics of a vessel type also determine how a vessel is used. These properties should be identifiable to the archaeologist as well.

CHAPTER 3

SITE DESCRIPTION AND ARCHAEOLOGY

Environmental Setting

The Tugalo site (9Stl) is located in Northeast Georgia near the confluence of the Tugaloo River and Toccoa Creek in Stephens County (Figure 1). The site lies in the upper region of the Piedmont physiographic province approximately 19 km south of the Blue Ridge physiographic province boundary. Headwaters of the Tugaloo River originate in the latter province.

Topographically, the Piedmont is characterized by gently rolling hills separated by narrow valleys (Wharton 1977). Fenneman (1938) has identified that portion of the Upper Piedmont in which the site is located as the Dahlonega Plateau. Topography here consists of steeper hills and narrower valleys than generally found in the Piedmont. However, the eastern portion of the Dahlonega Plateau, in the vicinity of the site, is less sharply dissected. As a result, valleys are wider and have large areas of floodplain (Fenneman 1938).

The Piedmont province is rich and varied in animal and plant resources. Animals which were present in the area (Golley 1962), and important in Southeastern Indian food

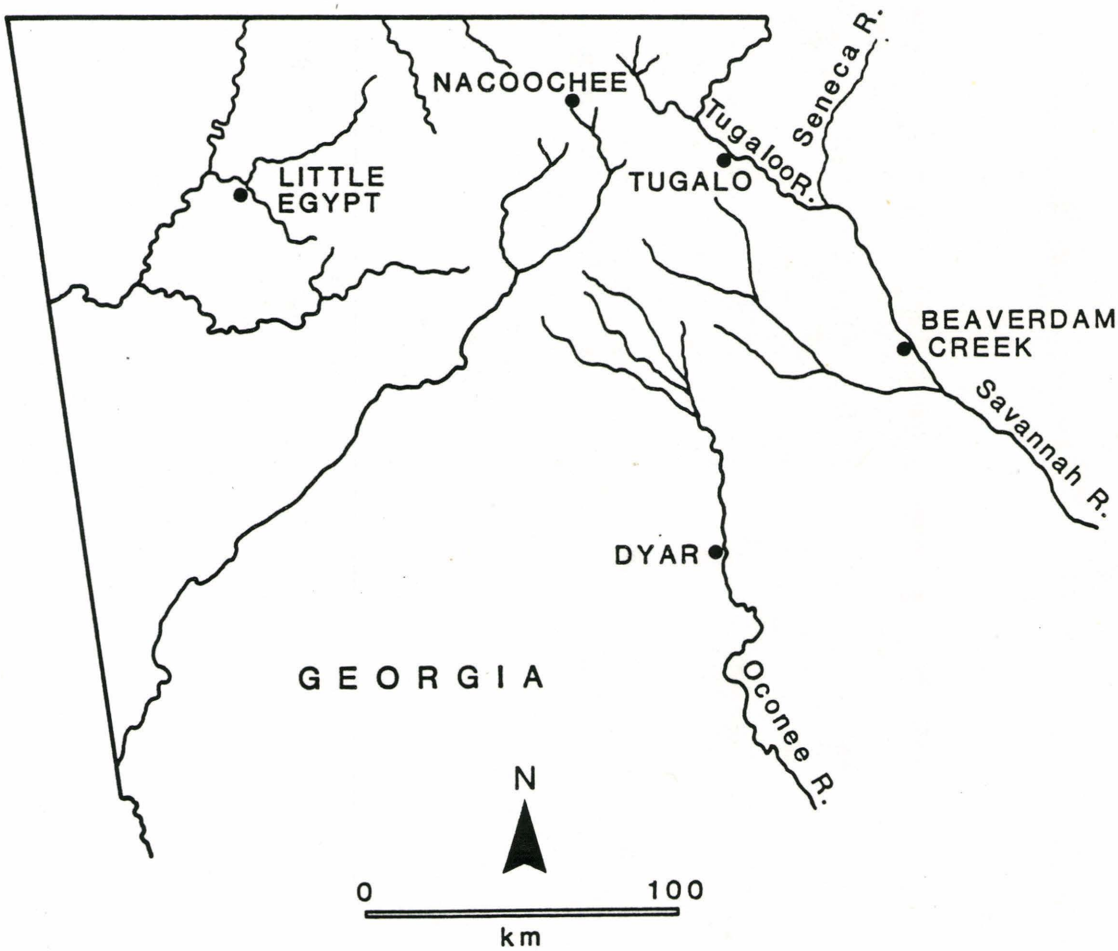

Figure 1. Locations of the various sites discussed in the text.

habits (Swanton 1946), included white-tailed deer (*Odocoileus virginianus*), turkey (*Meleagris gallopavo*), and black bear (*Ursus americanus*). Aquatic resources consisted of various fish species with aboriginal dietary emphasis on catfishes (Ictaluridae), suckers (Catostomidae), and bowfin (*Amia calva*). Freshwater mollusks and turtles were available as well (Shapiro 1983:55). The natural forest vegetation for the Georgia Piedmont has been identified as oak-hickory-pine (Kuchler 1964). Acorn and hickory nuts were an abundant food resource in this type of forest environment and are known to have been important in the Southeastern Indian diet (Hudson 1976:301).

The alluvial soils of the Tugaloo River floodplain were probably well suited to hoe agriculture. The maximum width of the Tugaloo River in the vicinity of the site is 1 km (Figure 2). There are approximately 160 ha of floodplain within a 1 km radius of the site. The floodplain location of the Tugalo site provided its inhabitants with easy access to fertile soil as well as riverine and upland food resources.

Site History

Historically, Tugalo was a town of the Lower Cherokee. This town was perhaps the principal trading center for the Lower Cherokee, with the English at Charles Town, during the first third of the eighteenth century (Williams and Branch 1978:32). An English factor was settled at the town by

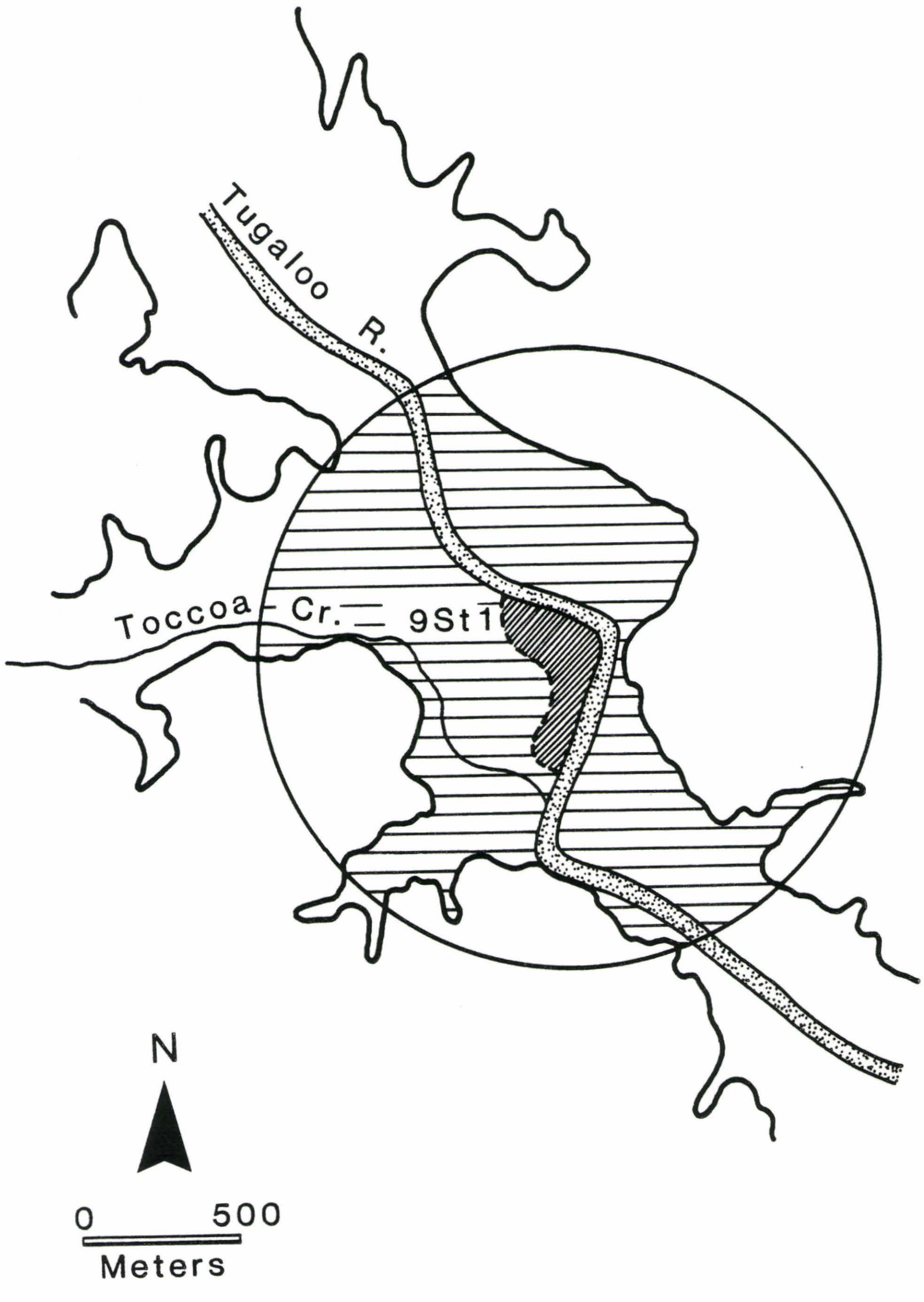

Figure 2. Floodplain area within a 1 km radius of the Tugalo site (9Stl).

1716. By 1721, the population at Tugalo numbered 208 people (Williams and Branch 1978:32). In 1776, Tugalo was burned by the Georgia militia as were a number of Lower Cherokee settlements during the American Revolutionary War (Kelly and de Baillou 1960:4). Following this event, Tugalo's status as a town diminished.

Archaeological Investigations

The Tugalo site consists of a mound and village area. In a 1957 River Basin Survey conducted by Joseph Caldwell, artifacts were found covering an 8 ha area adjacent to the mound. Directly across the Tugaloo River in a somewhat northeasterly direction, a 4 ha site, 38Oc31, has been reported as having historic Cherokee material contemporary with Tugalo (Caldwell 1953; Marshall Williams, personal communication 1985). This indicates that the historic occupation of Tugalo occurred on both sides of the river.

The mound was first described by Cyrus Thomas in 1894 as conical in shape and measuring 14 ft high by 100 ft in diameter. Prior to the mound's excavation in 1956, Caldwell noted that the mound had been cultivated for a number of years. He does not provide a description of the mound's shape, but reports that the mound measured 10 ft high and 120 ft in diameter.

Archaeological investigations at the Tugalo site began in 1894 and have been described by Cyrus Thomas (Wauchope 1966). The mound's stratigraphy was tested by placing a single "shaft" down through the center of the mound. Eight strata were identified as a result of this testing. The earliest cultural stratum consisted of a pre-mound midden followed by a stratum of river-deposited sand. Stratum 3 was a dark clay layer containing charcoal and potsherds. Stratum 4 consisted of a hard layer of red clay while Stratum 5 exhibited more river-deposited sand. Stratum 6 was identified as a layer of dark clay. Stratum 7 consisted of a thin, 1 inch layer of charcoal which was followed by the uppermost Plowzone Stratum.

No further archaeological investigations occurred at Tugalo until the 1950's. In 1952, William Edwards, representing the University of Georgia and the Tsali Institute, began exploratory excavations adjacent to the mound. Although Edwards' results were never published, David Hally (personal communication 1985) has determined that approximately 270, 5 ft squares were excavated. These units were laid out in a series of east-west and north-south trenches covering an area of approximately 25,000 ft^2 southeast of the mound. Excavation depths ranged between 6 inches and 60 inches below ground surface. The deepest excavation was conducted within a linear feature identified by Edwards as a "ditch". Photographs of one excavation profile show the "ditch" as measuring approximately 72 inches across and at least 18 inches deep.

Due to impending inundation of the Tugalo site by Lake Hartwell, extensive mound excavations were conducted by

Caldwell for the Smithsonian Institution between October 1956 and March 1957. Exploration of the mound began with the excavtion of a 60 ft by 20 ft north-south trench across the mound summit. This trench was excavated to a pre-mound stratum approximately 10 ft to 12 ft below the summit. Excavations were then expanded to include most of the northwest and southeast portions of the mound. The area of excavation on the mound decreased from approximately 2400 ft^2 to 440 ft^2 as excavations progressed downward. At the same time, a test trench was extended from the mound summit in a northeast direction to the river.

During the excavations Caldwell (1956a) noted four distinct stages of mound building. He believed that each of these stages consisted of a rectangular earthen platform surmounted by a rectangular earthen lodge. One, and possibly more, subsequent mound stages had been destroyed by plowing and erosion on the mound. These stages were observable only on the periphery of the mound and were represented by: a brown earth stratum overlying a burned zone; a thick midden labeled the "Northeast Dump"; and lastly an historic stratum. The "Northeast Dump" consisted of a mass of broken ceramic vessels and food bone 4 ft thick. The "dump" was excavated in three levels: lower, middle, and upper. Ceramics recovered from the "Northeast Dump" midden are the focus of this study.

Based on Caldwell's stratigraphic data, Williams and Branch (1978) have shown that continuous site occupation very likely occurred from late Middle period Swift Creek to the Historic period (Table 1). The first of ten distinct mound strata, the pre-mound stratum, contained ceramics dating to the late Middle period Swift Creek and Etowah I and II. Strata 2 through 5 were each associated with earthlodge strata and contained Etowah III and IV ceramics. Above the final earthlodge stratum was an ashbed layer divided into two strata. Stratum 6 contained Etowah V ceramics indicating late Etowah mound use. Stratum 7 had the first indication of early Lamar ceramics. Stratum 8, the brown earth layer, contained mostly early Lamar ceramics. The ninth stratum, the "Northeast Dump", contained pottery identifiable as late Lamar. The historic stratum, the tenth and final stratum, contained ceramics similar to those found in the "Northeast Dump". Caldwell believed that this stratum was the result of eighteenth century mound use (Williams and Branch 1978). The best collection of eighteenth century historic Cherokee artifacts, however, was obtained by Edwards from the village (David Hally, personal communication 1984).

The "Northeast Dump"

The "Northeast Dump" was a stratigraphic unit encountered in the test trench which extended from the mound in a northeast direction to the river bank. The "dump", located on the northeast corner of the mound, covered a large portion of this area of the mound. The total

STRATUM	OCCUPATION PERIOD
Premound	late middle period Swift Creek/ Etowah I and II
First earthlodge	Etowah III and IV
Second earthlodge	Etowah III and IV
Third earthlodge	Etowah III and IV
Fourth earthlodge	Etowah III and IV
Burned/ashbed lower stratum	Etowah V
Burned/ashbed upper stratum	Etowah V/early Lamar
Brown earth stratum	early Lamar
"Northeast Dump"	late Lamar
Historic	late Lamar/historic

Table 1. Tugalo mound stratigraphic sequence with periods of occupation.

horizontal extent of the "dump" was not determined through excavation. However, it is known that the outer edge of the "dump" continued as much as 6 ft beyond the northern edge of the upper burned mound stratum. Caldwell identified six strata within three zones as comprising the "Northeast Dump" (Figure 3). Why he combined these into a single stratigraphic unit is not known.

The thickness of the deposit and number of strata suggest the midden may have accumulated over a considerable period of time. However, comparisons of pottery from the three zones failed to indicate significant ceramic differences between the lower and upper zones. Archaeologists have determined that the widths of folded rims on Lamar Complicated stamped jars gradually increased throughout the Lamar period (Hally 1979; Rudolph and Hally 1983; Smith 1981). For example, folded rims associated with the early Lamar Little Egypt phase average 11.1 mm in width while those rims from the late Lamar Barnett phase average 16.8 mm. Folded rim widths from the Lower, Middle and Upper zones of the "Northeast Dump" average 16.0 mm, 16.7 mm, and 16.4 mm, respectively. The absence of significant variation in rim widths between the three zones, and the occurrence of late Lamar incised motifs within each zone, indicate that the "Northeast Dump" strata accumulated over a relatively brief period of time. Consequently, ceramics from the three zones have been combined to provide a larger pottery sample for this study.

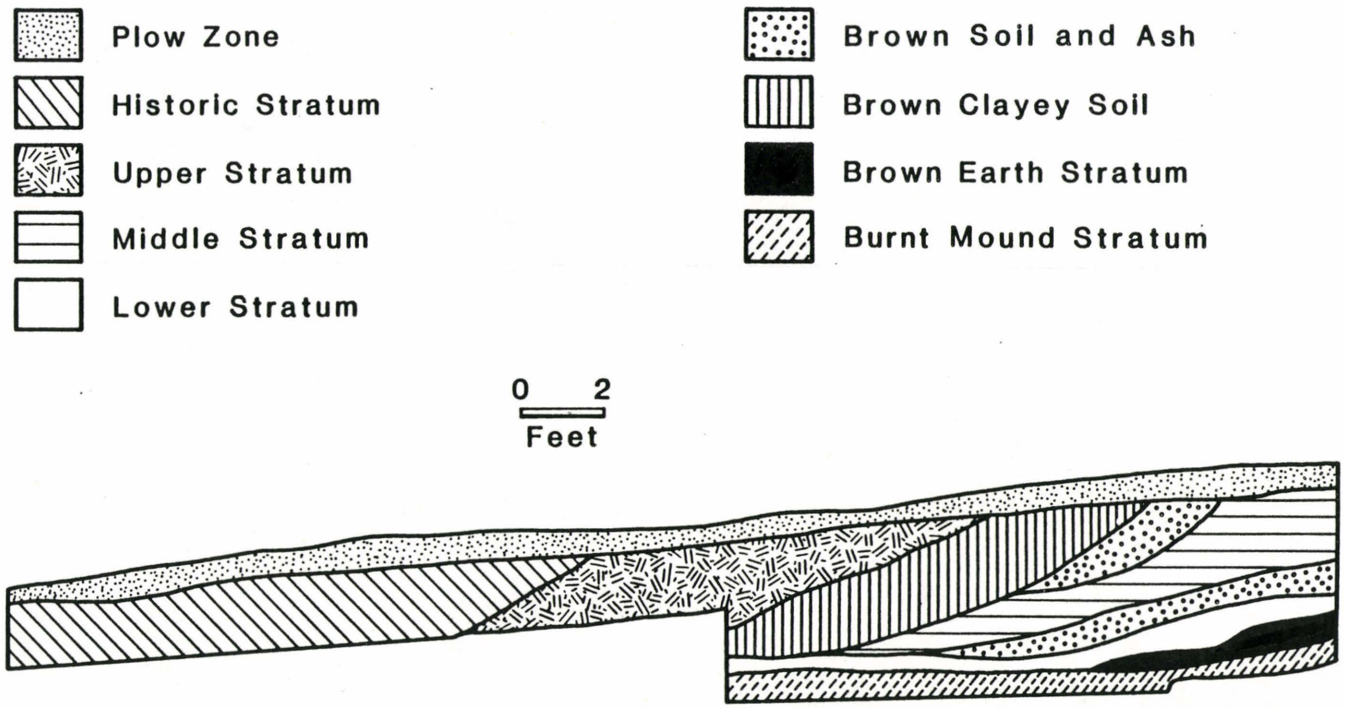

Figure 3. Stratigraphic profile of the "Northeast Dump" (NE-SW).

The fact that Caldwell recognized this stratigraphic unit as a "dump" has interesting behavioral implications. What was the nature of the material which suggested to Caldwell that all three zones constituted a "dump"? First, there occurred an unusually large amount of pottery sherds combined with a high frequency of animal bone and ash. Second, earlier mound fill strata were generally sterile (Caldwell 1957). Third, the midden strata lie on a sloping mound flank which indicates that they did not accumulate in situ. Instead, the midden strata are a result of debris being redeposited on a mound slope.

Recognizing the "Northeast Dump" strata as secondary deposits leads to questions concerning the origin of the midden debris. Archaeological records are inadequate; therefore, we can only hypothesize as to the nature of the midden. If the midden strata were incorporated into two, and possibly three, mound stages, and the midden debris is viewed as an intentional relocation of refuse, what then, is the origin of this material?

The first of three possibilities is that the debris was originally refuse which had accumulated in the village area and was redeposited on the mound slope as fill for later mound stages. Second, there is ethnographic evidence for high status residences having been situated on summits of Misssissippian platform mounds (Neitzel 1965). The midden may have resulted from domestic activities associated with such a residence. A third possibility is based on ethnographic evidence for ceremonial activities which took place on mound summits (Swanton 1946). The truncated effect of the Upper and Middle strata, as illustrated in Figure 3, suggests that the debris originated on the mound summit. The midden, having resulted from mound-summit sweeping, may then have been incorporated into mound construction stages. The most important question is whether the midden strata accumulated as a result of domestic activities or ceremonial mound summit activities.

The "Northeast Dump" midden contained approximately 12,000 sherds. Many of these sherds are large and may constitute as much as one-fifth of the original vessel. The quantity of large sherds permitted vessel reconstruction to some degree. Large sherds, especially rim sherds, were available for obtaining measurements and observing vessel profiles. The fact that the collection accumulated over a relatively brief period of time permits vessel assemblage reconstruction and comparisons with other contemporaneous collections.

"Northeast Dump" Ceramics

Ceramic material from the "Northeast Dump" stratum can be identified with Lamar culture. The pottery resembles ceramics described by Jennings and Fairbanks (1939) for the Lamar type-site in Central Georgia and exhibits typical Lamar characteristics: folded and applique, pinched rims; bold incising usually limited to rim and neck areas of vessels, especially the carinated bowl form; and heavily impressed complicated stamping which may or may not occur with incised vessels.

Archaeologists are able to recognize temporal and regional variants of Lamar culture (Hally 1979; Hamilton and Swindell 1975; Smith 1981). Temporal variants of Lamar are based on changes in pottery types usually with respect to surface decoration. For example, early Lamar (A.D. 1350-1500) vessels lack incising and folded rims are narrow. Rim modifications such as pinching and punctating usually cover the whole rim due to narrow rim widths. In contrast, late Lamar (A.D. 1500-1700) pottery types exhibit incising and folded rims are wider. Punctates and pinching usually occur at the bottom of the rim fold leaving the upper portions of rims plain and smooth. Rim widths (16.4 mm) and the occurrence of Lamar Incised vessel types indicate that the "Northeast Dump" collection is late Lamar.

There are a number of regional variants of late Lamar in Georgia. These include the Dyar phase (Smith 1981) on the Oconee River, Cowart's phase on the Ocmulgee River (Hamilton and Swindell 1975), Bull Creek phase on the mid- to lower Chattahoochee River (Hally and Oertel 1977), and the Barnett phase in Northwest Georgia (Hally 1979). These phases, besides being geographically separate, differ from one another primarily with respect to the frequencies of pottery types and decorative motifs (Table 2).

	Tugalo	Dyar	Cowarts	Bull Creek	Barnett
Lamar Incised	2	18	15	2	9
Dallas Incised	-	-	-	-	2
Lamar Complicated Stamped	91	8	35	26	10
Check Stamped	-	-	-	1	-
Brushed	-	<1	-	1	-
Lamar Plain	6	73	50	71	55
Dallas Plain	-	-	-	-	24
SAMPLE SIZE	7000	3100	10700	7200	1600

Table 2. Relative frequencies (%) of pottery types in 16th century Lamar phases (Hally 1985).

The ceramic material from the "Northeast Dump" is equally distinctive. As shown in Table 2, The Tugalo material is distinctive in having the highest frequency of complicated stamped pottery with 91%. Cowart's phase has the second highest occurrence of complicated stamped vessels, only 35%. The low frequency of Lamar Plain (6%) also distinguishes Tugalo from these other phases. These other phases have at least 50% of their material consisting of Lamar Plain with Dyar as high as 73%.

Based on the information presented thus far, the pottery from the "Northeast Dump" at Tugalo is considered to represent a regional manifestation, or phase, of late Lamar. This phase has been designated the Tugalo phase (Hally 1985) and its vessel assemblage will be described in detail in Chapter 5.

CHAPTER 4

METHODS

Analysis of the ceramics from the "Northeast Dump" proceeded with two objectives: 1) to establish shape and size classes of vessels in the Tugalo collection; and 2) to compare the Tugalo phase vessel assemblage with that of the Barnett phase vessel assemblage. Prior to the present analysis, ceramic sherds from the lower, middle, and upper levels of the "dump" had been cleaned and cataloged. Approximately one dozen vessels had been restored or reconstructed by Marshall Williams and Carolyn Branch. Decorative motifs had been identified and quantified as well.

As a first step in the present analysis, the widths of folded rims from each of the three levels were measured and compared. As was stated in Chapter 3 no significant changes in widths were evident from the lower to the upper levels. The ceramic collection, therefore, was treated as representing a single archaeological phase at Tugalo.

Vessel reconstruction proved difficult and unproductive. As a result, vessel fragments, especially large rim sherds, constituted the majority of specimens for this study. Only those sherds which were large enough to indicate overall vessel shape were included in the analysis. Initially, whole and partially reconstructed vessels provided the most evidence for vessel shape classes.

Profiles were obtained by tracing a light-cast silhouette onto paper. Rim sherds were placed at a constant distance from the light source in order to minimize profile distortion. Using this technique, vessel profiles could then be drawn in a rapid and consistent manner. Profiles of whole and partial vessels were drawn in those cases where vessel shape classes were difficult to distinguish and in order to see variation within shape classes. However, the majority of rim sherds could be placed into shape classes from a simple visual inspection of actual specimens.

After rim sherds were classified according to shape, all specimens were examined to see if there were more than a single rim sherd representing the same parent vessel. If a vessel was represented by two or more rim sherds, all but one sherd was eliminated from the analysis. In this manner, minimum numbers of vessels (MNV) were obtained for each shape class. As a result, an accurate count could be obtained of the number of vessels representing each shape class.

Once MNV's were obtained, various physical attributes were noted for each of the specimens. Attributes considered important are sooting, polishing, smudging, and pitting of the interior vessel wall. One problem encountered with rim sherds is that a substantial amount of vessel wall has to be retained in order to observe these various attributes. With the Tugalo material this was not always possible. As a result, a consistent quantification of these attributes could not be obtained. Rim treatments, such as punctating and pinching, were noted as well. Lastly, several measurements were taken such as orifice diameter, maximum vessel diameter, and maximum vessel height, when possible, to use in determining vessel size classes.

Orifice diameters were obtained for 208 rim sherds using a rim diameter board. This board is subdivided into 1 cm intervals. A rim sherd is correctly oriented and placed on the interval which corresponds closest to its interior curvature. Maximum vessel width was measured, when possible, in the same manner. Vessel height measurements could not be obtained for very many vessels. It is assumed that vessel height varies with maximum diameter.

Regression analysis was used to measure the relationship between orifice diameter and maximum vessel diameter. Using this statistical method, the premise that both are related variables was confirmed. Table 3 shows that as orifice diameters increase so do vessel diameters. Orifice diameters can therefore be used as an accurate measure of overall vessel size in at least five shape classes. The correlation coefficients of orifice and vessel diameters are significant at the .01 level. The one exception is the carinated jar form. The flaring rim bowl, Mississippian jar, and "gravy boat" bowl shape classes do

Vessel Shape Class	Orifice Diameter/ Maximum Vessel Diameter
Pinched rim jar	.971
Carinated jar	.236
Carinated bowl	.995
Rounded bowl	.933
Flaring rim bowl	----
Mississippian jar	----
Cauldron	.989
Long neck jar	.966
"Gravy boat" bowl	----

Table 3. Correlations between vessel orifice diameter and maximum vessel diameter.

not have sufficient sample sizes to permit regression analysis inferences.

The orifice diameter measurements obtained were put in histogram form for each shape class. Size classes within each shape class were determined from simple inspection of the histograms. Frequencies of vessel types were calculated directly from the histograms as well.

Comparison of the Tugalo phase and Barnett phase vessel assemblages proceeded using the vessel type classes established for both. This comparison began with a visual inspection of shape classes with emphasis on the neck, orifice, and rim areas of vessels. Vessel type frequencies, based on histograms for both phases, were compared and graphs were used to illustrate the similarities and differences in vessel type frequencies.

Two important factors were considered throughout this comparison. The first factor is that differences could be expected since both vessel assemblages were derived from socially and politically distinct communities. Secondly, both assemblages were obtained from very different contexts. The Tugalo pottery was obtained solely from a mound-dump context whereas the Barnett ceramics came primarily from a domestic context, namely house floors. A very small percentage of vessels in the Barnett collection were obtained from burials in the village area and from a mound context.

CHAPTER 5

THE TUGALO PHASE VESSEL ASSEMBLAGE

Establishing vessel type categories provides a framework for the comparison of vessel shapes and sizes within a site and between sites (Shapiro 1983:185). These comparisons must be based on accurate and consistent descriptions of vessel types (Braun 1980:172; Shepard 1956:225). Shepard (1956:225) argues for a homogeneous nomenclature based on vessel contour and overall geometric shape. Terminology used in the following vessel shape descriptions is based on prior vessel form analyses with other Mississippian period vessel assemblages (Hally 1982, 1984). Emphasis is placed on those formal attributes which are considered to be important to vessel function. Certain terms used in the description of vessel shapes are defined according to their use here. These terms are as follows:

Neck- refers to that portion of a vessel which is restricted below the rim and above the vessel body. Necks are not present on all vessel shapes.

Orifice- the point of minimum diameter in the interior of a vessel usually occurring below the rim and above the vessel body. Some vessel shapes, such as bowls for example, have greatest restriction at the rim.

Point(s) of vertical tangency- the point(s) of minimum and maximum diameter on a vessel.

Rim- refers to the upper-, and often outer-, most edge of a vessel.

Vessel Type Descriptions

Nine vessel shapes have been recognized in the the Tugalo phase vessel assemblage (Figure 4). One shape class is represented by only a single fragment yet is well documented in other Lamar phases to warrant a legitimate category in the Tugalo phase. Most of the shape class names have been previously used in Mississippian period vessel type descriptions and are applicable to vessel shapes in the Tugalo assemblage. Other names used are considered descriptive of the vessel shape class.

Pinched rim jar

This is a globular bodied vessel with a constricted neck and orifice. Pronounced shoulders result from a sharp break occurring above the body and below the rim. Rims are outward flaring. Bases are rounded. Surfaces are usually complicated stamped and exteriors tend to be sooted. Rims are thickened and pinched. Clay is grit tempered.

Although very little formal variation occurs within this shape class, variation which does occur is exhibited in the rim and neck areas of vessels (Figure 5). Neck lengths vary from 2 cm to 6 cm and have a tendency to be vertical.

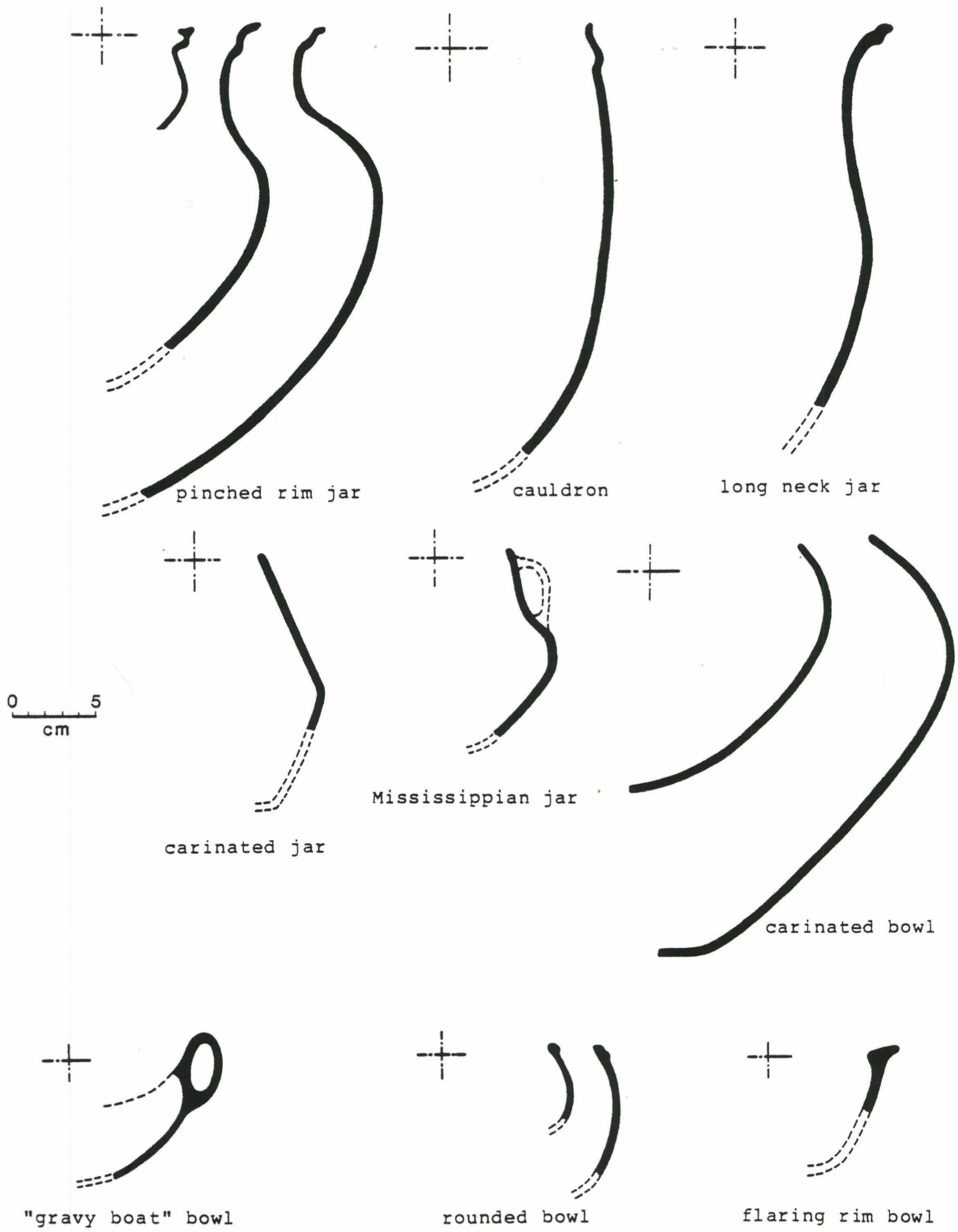

Figure 4. Profiles of the Tugalo phase vessel shape classes.

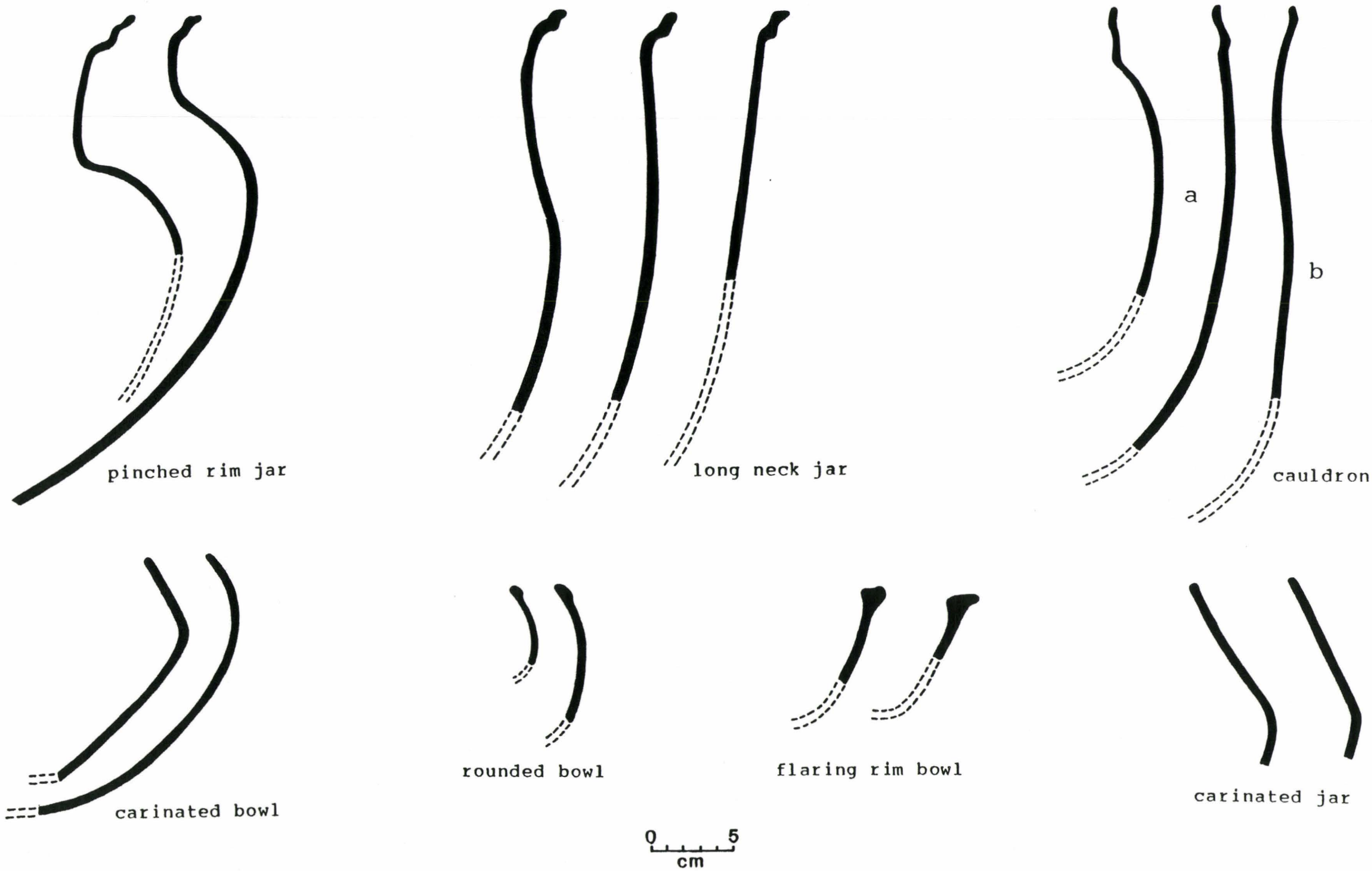

Figure 5. Profiles of the morphological variation among Tugalo phase vessel shape classes.

However, some vessels may have an immediate flaring of the rim just above the shoulder.

One anomaly in this shape class is an unusually small jar with a plain and polished exterior surface. The rim is missing but was probably pinched. The clay is of quartz and steatite temper.

Carinated jar

This is a small, deep jar with a rounded lower body, straight and relatively long upper wall, and restricted orifice. Although bases were not directly observable, they are probably flat (see description of the carinated jar form in Chapter 6). Upper walls are inward sloping and may contribute as much as one-third to one-half of a vessel's overall height. The point of vertical tangency, the point of maximum vessel diameter where upper and lower walls join, is marked by a sharp break in vessel profile. Upper walls are always incised and bodies exhibit complicated stamping. Rims are plain and smooth. Vessels showed no evidence of sooting. Clay is grit tempered.

One distinctive vessel is three times larger than the average sized carinated jar (Figure 5) and has a slightly concave upper wall which is further accentuated by an outward flaring rim. The actual rim is missing, however. The upper portion of this vessel is incised while the body is stamped. This vessel fits most easily in the carinated jar category, but is probably best treated as unclassifiable. More specimens of this shape are needed before a legitimate shape class is established.

Carinated bowl

This bowl form has an inward sloping upper body, an outward sloping lower vessel wall, and a flat or concave base. The point of vertical tangency at the junction of the upper and lower vessel walls is sometimes rounded but usually marked by a break in the vessel profile. This point is further accentuated by contrasting surface decorations. Upper walls are incised while stamping occurs on the lower walls. Punctates may also occur at this point. This bowl form has a tendency to be smudged on the interior, and sooting was present on some but not all specimens.

The most variation within this vessel shape class is found at points of vertical tangency (Figure 5). The angle between upper and lower vessel wall may be sharp or rounded. The length of upper wall between rim and point of vertical tangency varies as well. Upper walls may contribute anywhere from one-sixth to one-third of a vessel's overall height. Length is not necessarily relative to overall vessel size.

Rounded bowl

This is a deep vessel with rounded sides, a restricted orifice, and probably a flat base, although bases were not directly observable (see description of the rounded bowl in Chapter 6). Exterior surfaces are stamped although some plain surfaces do occur. Rims are thickened and pinched with the exception of one punctated rim. Interior surfaces have a tendency to be polished. Clay is grit tempered. Variation can be found in the upper wall curvature. The length of vessel wall from a point of vertical tangency to vessel rim determines orifice constriction. The greater the length, the more constriction a vessel has.

Flaring rim bowl

Only two rim sherds suggest the occurrence of this vessel shape. These sherds exhibit a slightly rounded curvature to the vessel walls and rims are flared. Although not directly observable, bases are flat (see flaring rim bowl description in Chapter 6). One sherd has a stamped exterior while the other is plain. Incised markings occur on the uppermost surface on one of the rims. Clay is grit tempered.

Mississippian jar

This vessel form is represented by two partially reconstructed vessels, two rim sherds with handles, and one handle retaining 3 cm of its rim. Based on the literature (Hally 1979), this jar is a shouldered vessel with a globular body, rounded base, and constricted neck and rim. Necks exhibit a slight, inward curvature. Strap handles are attached at the rim and shoulder. All five examples have plain rims while surface decoration is quite varied among them. Clay is grit tempered.

With respect to decoration, one rim sherd has a stamped exterior with punctates on the strap handle. Another has Incised Line Filled Triangles on both the neck and strap handle. A partially reconstructed jar has stamping on both the neck and body, while the other partially reconstructed vessel has Lamar Bold Incised type of motifs on the neck, punctates on the shoulder and stamping on the body. Strap handles are missing on this particular vessel. The vessel represented by the solitary strap handle is plain with a possible node at the base of the handle.

"Gravy boat" bowl

Only one fragment of this vessel type, a loop handle attached to a flange, was found in the study collection. Nodes occur on the exterior while sooting is evident on the interior. Based on the occurrence of this vessel type in the Barnett phase vessel assemblage, Hally (1983:16) gives the following description:

> . . . a small, oval bowl with flat base, rounded sides and restricted rim. A large flange extends upward several centimeters from the rim at each end of the vessel and has a loop handle attached to its exterior surface. Applique nodes cover the upper portion of the exterior vessel wall.

Long neck jar

There are two formal variations of this shape class as illustrated in Figure 5. Variant A has generally straight walls, although these walls may be outward flaring, little or no rim constriction, and probably a rounded base though not directly observable. Rims are pinched, and may be either flush with the vessel wall or somewhat flared. Surfaces are complicated stamped.

Variant B exhibits a somewhat globular body, a slight constriction which occurs just above the body, and a somewhat concave neck exaggerated by a flaring rim. Rims are pinched except for one vessel which has a punctated rim. Surfaces are usually complicated stamped with the exception of two plain and polished vessels. Vessels of both A and B variants have a tendency to be sooted. Clay is grit tempered.

Cauldron

Two diagnostic characteristics of this vessel shape are size and rim elaboration. The overall form is that of a deep, straight sided vessel with a scalloped rim. No bases were directly observable but are believed to have been rounded. Orifice constriction, when present, occurs approximately 4 cm below the rim. Rims exhibit the greatest amount of variation and may be either punctated or pinched. The degree to which a rim is scalloped varies. Rim undulation may be slightly rounded, or severe and "V" shaped. Vessel interiors are always polished and exteriors tend to be lightly sooted. Exteriors are also complicated stamped. Clay is grit tempered.

One atypical cauldron is quite globular in shape (Figure 5). Its vessel walls have a great amount of inward sloping curvature which terminates in a punctated, scalloped rim. This cauldron has a restricted orifice relative to the other vessels in this class.

Six vessels do not exhibit many of the attributes characteristic of the cauldron shape class, yet these vessels have the same overall shape which places them in this class. All six vessels have incising extending 7 cm to 15 cm below the rim. Five of the six vessels have rims which are not scalloped. Four vessels have plain, smoothed rims while two have pinched rims. All six vessels exhibit complicated stamping below the incising on their exteriors.

Vessel Type Frequencies

For the Tugalo phase vessel assemblage, vessel size variability and vessel size classes have been determined from orifice diameter measurements. Orifice diameter measurements were plotted for 208 vessels in histogram form as illustrated in Figure 6. Two shape classes, the flaring rim bowl and "gravy boat" bowl, lack an adequate number of measurable rims. As a result, hypotheses concerning size distribution with respect to these classes cannot be made.

With regard to orifice diameter measurements, Hally (1984:16) has noted from the ethnographic literature that whenever three or more size classes are manufactured the middle size class is most common in household usage. Therefore, a histogram based on a random sample of sherds would tend to resemble a normal distribution with the

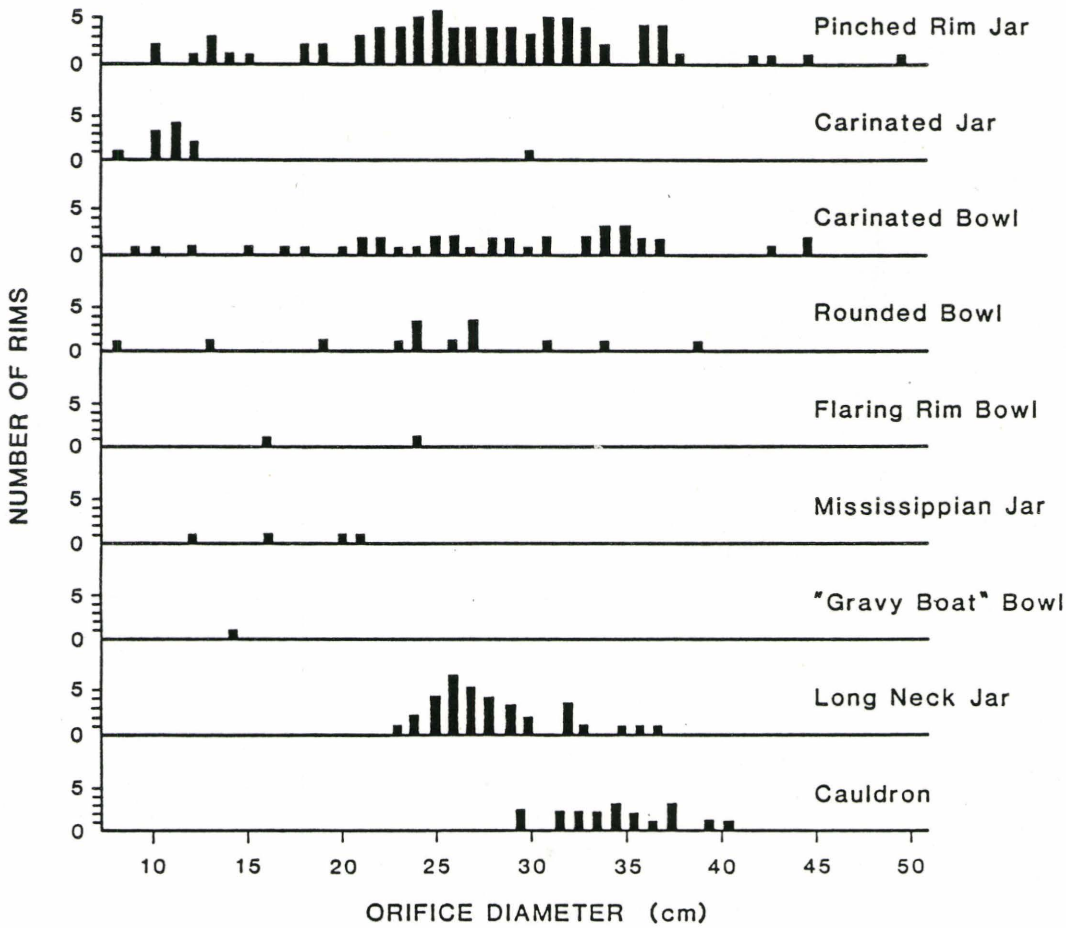

Figure 6. Tugalo phase size distribution of orifice diameters by vessel shape class.

greatest number of measurements falling in the middle size range. When determining vessel size classes, ideally, histograms should reveal discreet clusters of measurements augmented by normal distributions within these clusters. However, factors such as measurement error and small sample size usually affect the "ideal" histogram. Also, size classes often overlap making it difficult to determine vessel size class boundaries.

Figure 6 shows the most noticeable differences between shape classes to be the range of sizes in which the vessel shapes occur and the frequencies with which shape classes occur. With respect to size range, pinched rim jars have the widest range of orifice diameter measurements, 41 cm. In contrast, carinated jars have the most limited range, 5 cm, excluding the one anomalous vessel. Other relatively limited size distributions include long neck jars, cauldrons, and Mississippian jars. Besides pinched rim jars, shape classes having a wide range of orifice diameters are the carinated bowls and rounded bowls.

Shape classes which have a wide range of orifice diameters probably were manufactured in more than one size class. For example, pinched rim jars appear to have been manufactured in three sizes: small (10-15 cm), medium (18-38 cm), and large (42-50 cm). The highest frequency of vessels occurs in the middle size range. Based on the wide range of orifice diameter measurements, carinated and rounded bowls probably also had multiple size classes. A trimodal distribution is suggested for the carinated bowl with small (9-12 cm), medium (15-37 cm), and large (43-45 cm) vessel types. However, the division between small and medium vessel types is not well defined. Although only three vessels would be included in the small bowl type, the size difference between the smallest vessel (9 cm) and the largest of the medium size class (37 cm) warrants two size classes. The 2 cm gap between 12 cm and 15 cm is the largest gap within the orifice diameter range. Rounded bowls have at least a bimodal distribution based on the size difference between the smallest (8 cm) and largest (39 cm) vessels. Size classes can not be identified with any degree of certainty, however, due to the small number of rims relative to the wide range of orifice diameter measurements.

Carinated jars, excluding the anomaly, long neck jars, and cauldrons all appear to have been manufactured in a single size class. Mississippian jars are considered unimodally distributed as well. However, the sample size of four rim sherds is not an adequate basis for any conclusive statements to be made.

Based on the histograms, fourteen morphological vessel types have been identified for the Tugalo phase vessel assemblage. Table 4 lists all the vessel types, their size ranges, and the frequencies in which the vessel types occur relative to their own shape classes and the total assemblage. Jar forms are the most common and constitute 62.8% of the total assemblage. Bowl types occur at a much

Morphological Type	Orifice Diameter Range (cm)	% of Shape Class	Frequency in Study Collection	% of Total Collection
Small pinched rim jar	10-15	9.7	8	3.8
Medium pinched rim jar	18-38	85.3	70	33.6
Large pinched rim jar	42-50	4.7	4	1.9
Carinated jar	8-12	90.9	10	4.8
Large carinated jar	30	9.0	1	0.4
Small carinated bowl	9-12	7.5	3	1.4
Medium carinated bowl	15-37	85.0	34	16.3
Large carinated bowl	43-45	7.5	3	1.4
Rounded bowl	8-39	100.0	14	6.7
Flaring rim bowl	16-24	100.0	2	0.9
Mississippian jar	12-21	100.0	4	1.9
"Gravy boat" bowl	14	100.0	1	0.4
Long neck jar	23-37	100.0	35	16.8
Cauldron	30-41	100.0	19	9.1

Table 4. Tugalo phase morphological vessel type frequencies.

lower frequency of 27.1%. Cauldrons constitute the remaining percentage of 9.1%. The frequency with which cauldrons occur, if combined with jar types, would contribute to an even greater frequency of total jar types present in the assemblage. Vessel types and their frequencies will be discussed further in Chapter 7.

CHAPTER 6

THE BARNETT PHASE VESSEL ASSEMBLAGE

Vessel Type Descriptions

The Barnett phase vessel assemblage has been identified from two late Lamar components from the Little Egypt site (9Mu102) and the Potts Tract site (9Mu103) in Northwest Georgia (Hally 1970, 1979). Eight shape classes comprise the Barnett phase vessel assemblage. These shapes are illustrated in Figure 7 and briefly described below.

Pinched rim jar

This is a globular vessel with a rounded base, constricted neck, and outflaring rim. Paste is grit tempered and exterior surfaces are usually complicated stamped.

Carinated jar

This vessel form has a globular lower body, straight, insloping upper walls, and flat base. A slight break in profile occurs where the lower body intersects the upper walls. Paste is grit tempered. Incising occurs on the upper vessel wall.

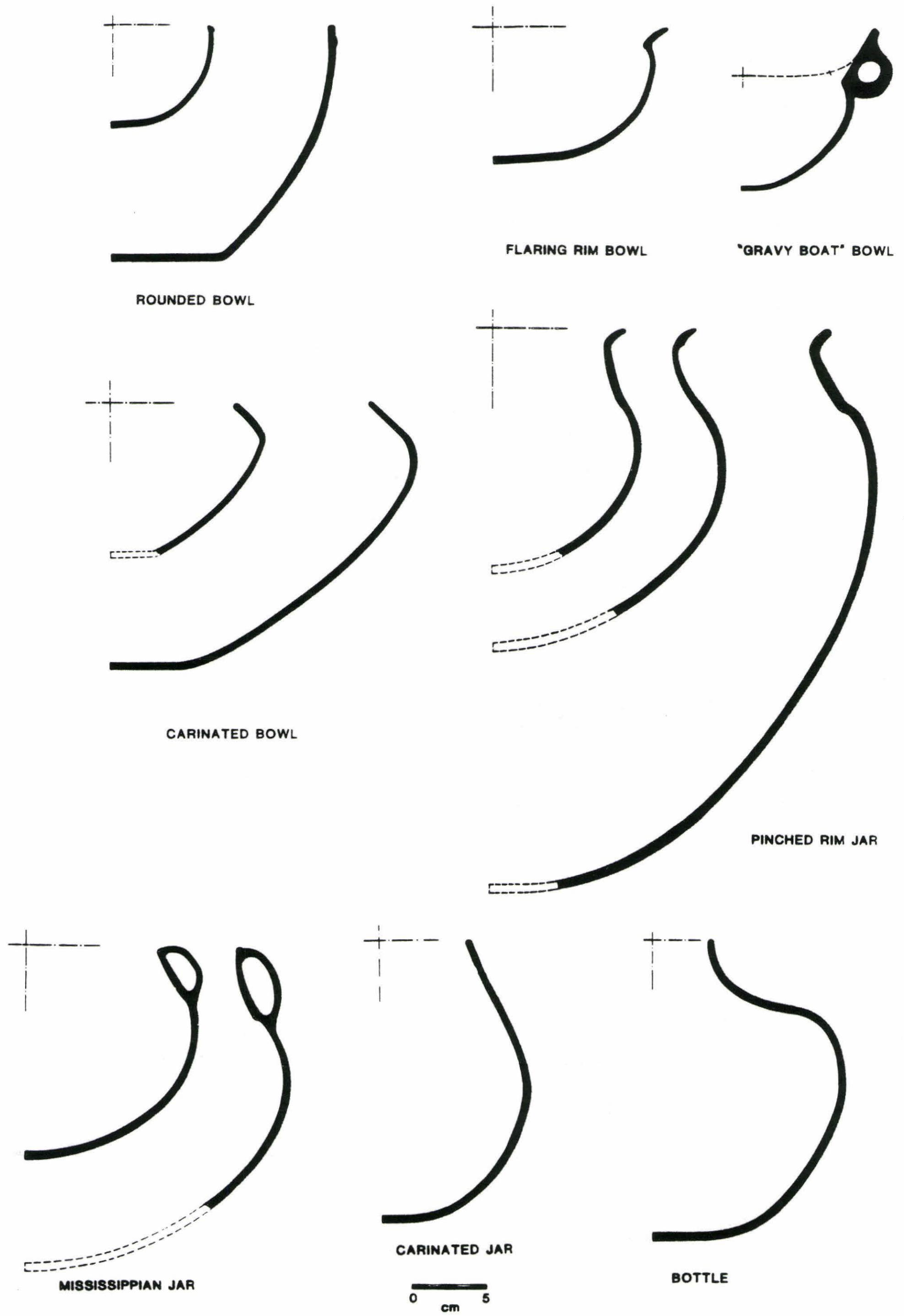

Figure 7. Profiles of the Barnett phase vessel shape classes.

Carinated bowl

This is a deep bowl with a flat base and insloping rim. There is a sharp break in profile where the lower and upper walls intersect. Paste is grit tempered but shell also occurs in some specimens. Upper walls exhibit incised decoration.

Rounded bowl

This vessel form has rounded sides, vertical or insloping rims, and flat, or occasionally rounded, bases. Rims are usually plain, but occasionally decorated with a filleted strip. Paste may be shell tempered but is usually grit tempered. Vessel exteriors occasionally exhibit a modeled decoration.

Flaring rim bowl

This is a small vessel with rounded sides, outflaring rim, and flat base. Paste is grit tempered with shell sometimes added. Incising usually occurs on interior rim surfaces.

Mississippian jar

This vessel form is globular in shape, has a constricted neck, and a rounded base. Rims are either vertical or insloping with handles extending from the rim to the vessel body. Paste is usually shell tempered and vessel necks and shoulders frequently exhibit incising.

"Gravy boat" bowl

This vessel form is unique in that it is a small, slightly oval bowl. Bases are flat, sides are rounded, and large flanges with handles occur at both ends of a vessel. Paste is grit tempered. Applique nodes may occur on either the vessel rim or over the upper portion of the exterior vessel surface.

Bottle

This is a globular vessel with a short neck, a vertical or insloping rim, and small orifice. Bases are flat. Paste may be either grit or shell tempered. Exterior surfaces are plain and may exhibit smudging and burnishing.

Vessel Type Frequencies

A total of 224 rim sherds were measured and orifice diameters plotted according to shape class in the Barnett phase ceramic collection (Hally 1983). Those shape classes which have wide orifice diameter ranges include pinched rim jars (39 cm), carinated bowls (31 cm), rounded bowls (27 cm), and Mississippian jars (39 cm) (Figure 8). Flaring rim bowls are restricted to a tighter range of 17 cm. Carinated jars have a small sample size and, as a result, the extent of their size distribution is uncertain. However, the two carinated jars in the Barnett collection have the same orifice diameter and the carinated jars from the Tugalo site have quite a restricted orifice diameter range. It is assumed, therefore, that carinated jars would tend to have

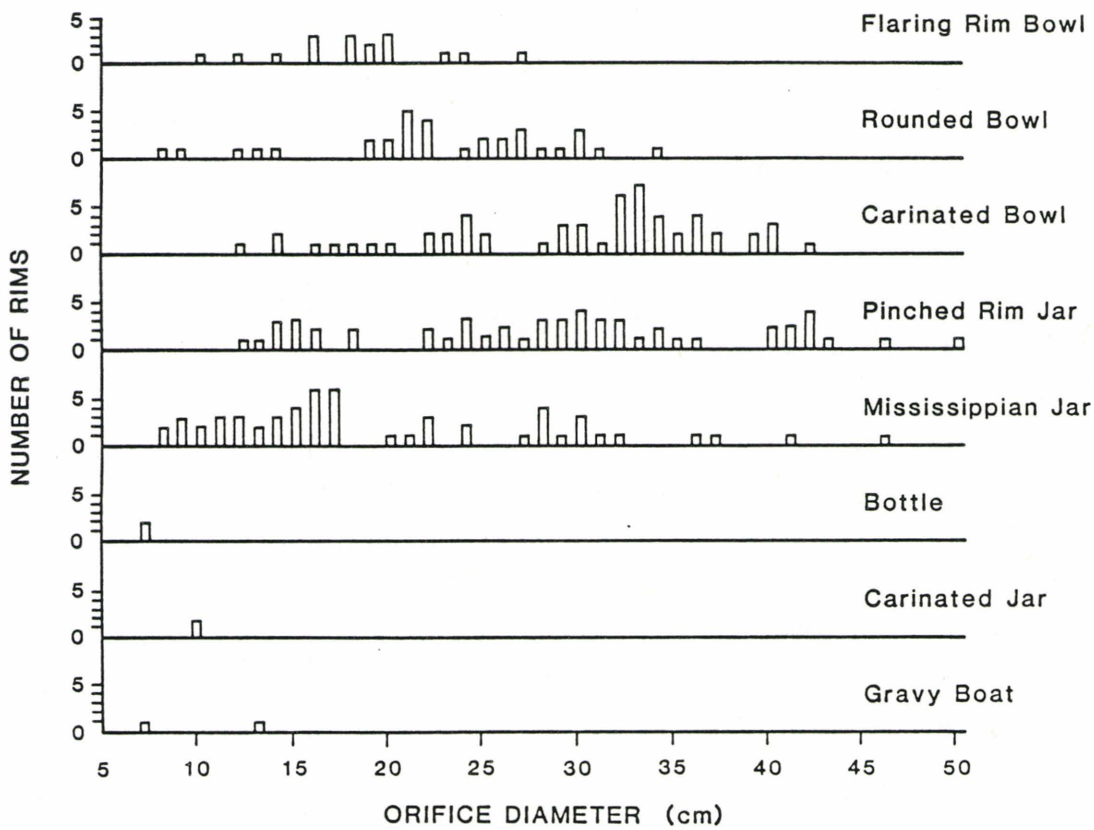

Figure 8. Barnett phase size distribution of orifice diameters by vessel shape class (from Hally 1983).

occurred in a limited size range. The "gravy boat" bowl sample size is too small for determining orifice diameter range.

Recently, Hally (1984) has placed the number of morphological vessel types for the Barnett phase vessel assemblage at seventeen. This number is based on the Shapiro-Wilk W test (Shapiro and Wilk 1965). The results of this test indicate that the carinated jar, flaring rim bowl, and "gravy boat" bowl were each manufactured in a single size. Carinated bowls were manufactured in three sizes while pinched rim jars and Mississippian jars were each manufactured in four sizes. The Shapiro-Wilk W test also suggests that the rounded bowl was manufactured in a single size. However, Hally (1984:58) feels that at least two, and possible three, sizes are represented.

Earlier investigations by Hally (1982, 1983) with the Barnett phase ceramics placed the number of morphological types at thirteen. Criteria used by Hally to recognize these thirteen vessel types has been consistently used with the Tugalo phase ceramics. Since a Shapiro-Wilk W test was not performed with the Tugalo material, the thirteen originally designated vessel types in the Barnett phase will be used for comparison with the Tugalo vessel types. The Barnett phase vessel types are listed in Table 5 and will be discussed further in the following chapter.

Morphological Type	Orifice Diameter Range (cm)	% of Shape Class	Frequency in Study Collection	% of Total Collection
Small pinched rim jar	12-20	22.2	12	5.3
Medium pinched rim jar	22-36	57.4	31	13.8
Large pinched rim jar	40-50	20.3	11	4.9
Carinated jar	10	100.0	2	0.8
Small carinated bowl	13-25	31.5	18	8.0
Large carinated bowl	28-42	68.4	39	17.4
Small rounded bowl	8-14	17.6	6	2.6
Large rounded bowl	19-34	82.3	28	12.5
Flaring rim bowl	10-27	100.0	17	7.5
Small Mississippian jar	8-17	60.7	34	15.1
Large Mississippian jar	20-46	39.2	22	9.7
"Gravy boat" bowl	7-14	100.0	2	0.8
Bottle	7	100.0	2	0.8

Table 5. Barnett phase morphological vessel type frequencies.

CHAPTER 7

COMPARISONS

A comparison of the Tugalo phase and Barnett phase vessel assemblages shows that the most striking similarity between the two collections is their vessel shape classes (Figure 9). Seven out of a total of ten vessel shape classes are found in both assemblages (Table 6).

The pinched rim jar is similar in both assemblages and is characterized by a globular body, rounded base, constricted neck and outflaring rim. Surface decoration in both assemblages is complicated stamped, and vessels have a tendency to be sooted. The Tugalo phase pinched rim jars differ from those in the Barnett phase by having relatively longer necks and sharper breaks in profile where neck and shoulders intersect.

Carinated jars in both assemblages are morphologically similar. They both are characterized by globular bodies, convex to straight upper walls and plain, smooth rims. Upper vessel walls are incised in both collections. Vessels are not sooted. The only difference between the two assemblages is that complicated stamped design occurs on the lower walls of the Tugalo jars while both the Barnett vessels exhibit plain lower walls.

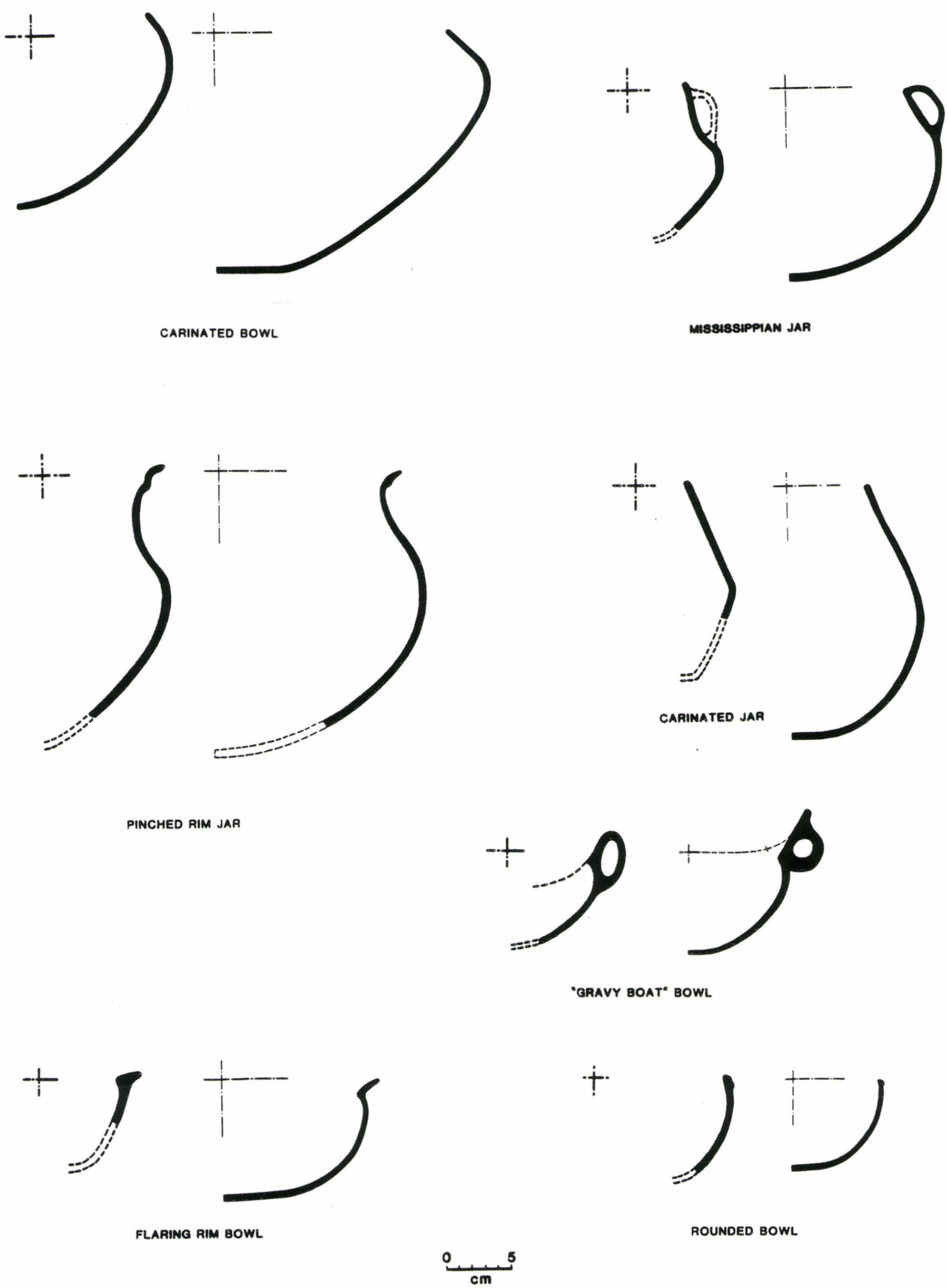

Figure 9. Profiles of the Tugalo phase (left) and Barnett phase (right) vessel shape classes.

Tugalo Phase Vessel Assemblage	Barnett Phase Vessel Assemblage
Pinched rim jar	Pinched rim jar
Carinated jar	Carinated jar
Carinated bowl	Carinated bowl
Rounded bowl	Rounded bowl
Flaring rim bowl	Flaring rim bowl
Mississippian jar	Mississippian jar
"Gravy boat" bowl	"Gravy boat" bowl
Long neck jar	------
Cauldron	------
------	Bottle

Table 6. Vessel shape classes which occur in the Tugalo and Barnett phases.

Carinated bowls in both assemblages are very similar morphologically. Lower walls are straight to slightly concave, upper walls are inward sloping, and bases are flat. Surface decoration consists of incising on the rims and complicated stamped lower walls. Vessels tend to be sooted. Vessels from both collections exhibit a certain amount of morphological variability especially with respect to the amount of break in vessel profile that occurs at the point of vertical tangency.

Overall, rounded bowls in both assemblages have similar morphological characteristics: rounded sides and somewhat vertical or insloping rims. Exterior surfaces are generally smooth and plain in both collections. Differences between the two collections is apparent in vessel wall curvature. Tugalo phase rounded bowls exhibit a greater degree of inward curvature resulting in more constricted orifices. Also, Tugalo phase rounded bowls tend to have pinched rims in contrast to plain rims characteristic of Barnett phase bowls. Filleted strips are also more common in Tugalo although Barnett phase rounded bowls exhibit this rim decoration, as described by Lewis and Kneberg (1946), as well. Sherds diagnostic of the rounded bowl shape class from Tugalo are of insufficient size to determine sooting frequencies. Barnett phase bowls tend to exhibit sooting.

Flaring rim bowls are morphologically similar in both assemblages. Similar characteristics are rounded sides and outflaring rims. Surfaces tend to be smooth and plain.

Rims may exhibit incising. Flaring rim bowls from both collections are not sooted. Tugalo phase flaring rim bowls tend, however, to be thicker at the junction of the rim and vessel wall.

Mississippian jars are similar in both collections and are characterized by globular bodies, rounded bases, and vertical to insloping necks. Handles occur on the uppermost portions of vessels. Vessels are either plain surfaced or decorated with incised lines on the shoulder and neck. Incised motifs are similar to those characteristic of Dallas Incised found in Tennessee (Lewis and Kneberg 1946). Vessels from both collections tend to be sooted. Differences are that Tugalo phase Mississippian jars exhibit the greatest amount of variation relative to sample size. Also, Tugalo phase jars appear to have more pronounced shoulders than those from the Barnett phase. Tugalo phase Mississippian jars are grit tempered whereas Barnett phase jars are usually shell tempered.

"Gravy boat" bowls appear to be similar in both collections. Similarities include an oval shape, flanges with handles at each end, and applique nodes covering vessel exteriors. Vessels in both collections exhibit sooting on interior rim surfaces.

Three vessel shapes are not shared by both assemblages. These are long neck jars, cauldrons, and bottles. Long neck jars and cauldrons are not represented in the Barnett study collection and the bottle shape is not represented in the Tugalo study collection.

The Tugalo phase and Barnett phase vessel assemblages are not only similar with respect to shape classes, but also in the relative frequencies with which these shape classes occur. Table 7 lists the overall frequencies of occurrence for each shape class. Figure 10 graphically illustrates that all shared vessel shapes occur with approximately the same relative frequency in each assemblage except for the Mississippian jar; the Mississippian jar being twelve times more common in Barnett than in Tugalo.

The number and dimensions of size classes represented in shared shape classes, and the frequencies of vessels within the size classes, are also very similar in both assemblages. The histograms in Figure 11 show that pinched rim jars have similar wide distributions of 40 cm and 38 cm for Tugalo and Barnett phases, respectively. Three size classes of roughly similar dimensions can be identified in each assemblage (Table 8). The relative frequencies of specimens within each size class correspond in both assemblages as well; the most common size class being the medium pinched rim jar, with small and large pinched rim jars the second and third most common types, respectively.

Carinated jars exhibit a narrow size range distribution in both collections. Although only two examples are present in the Barnett collection, this vessel shape is considered

Vessel Shape Class	Tugalo	Barnett
Pinched rim jar	39.3%	24.1%
Carinated jar	4.8%	0.9%
Carinated bowl	19.1%	25.4%
Rounded bowl	6.7%	15.2%
Flaring rim bowl	0.9%	7.6%
Mississippian jar	1.9%	25.0%
"Gravy boat" bowl	0.4%	0.9%
Long neck jar	16.8%	---
Cauldron	9.1%	---
Bottle	---	0.8%

Table 7. Relative frequencies of occurrence for the Tugalo phase and Barnett phase vessel shape classes.

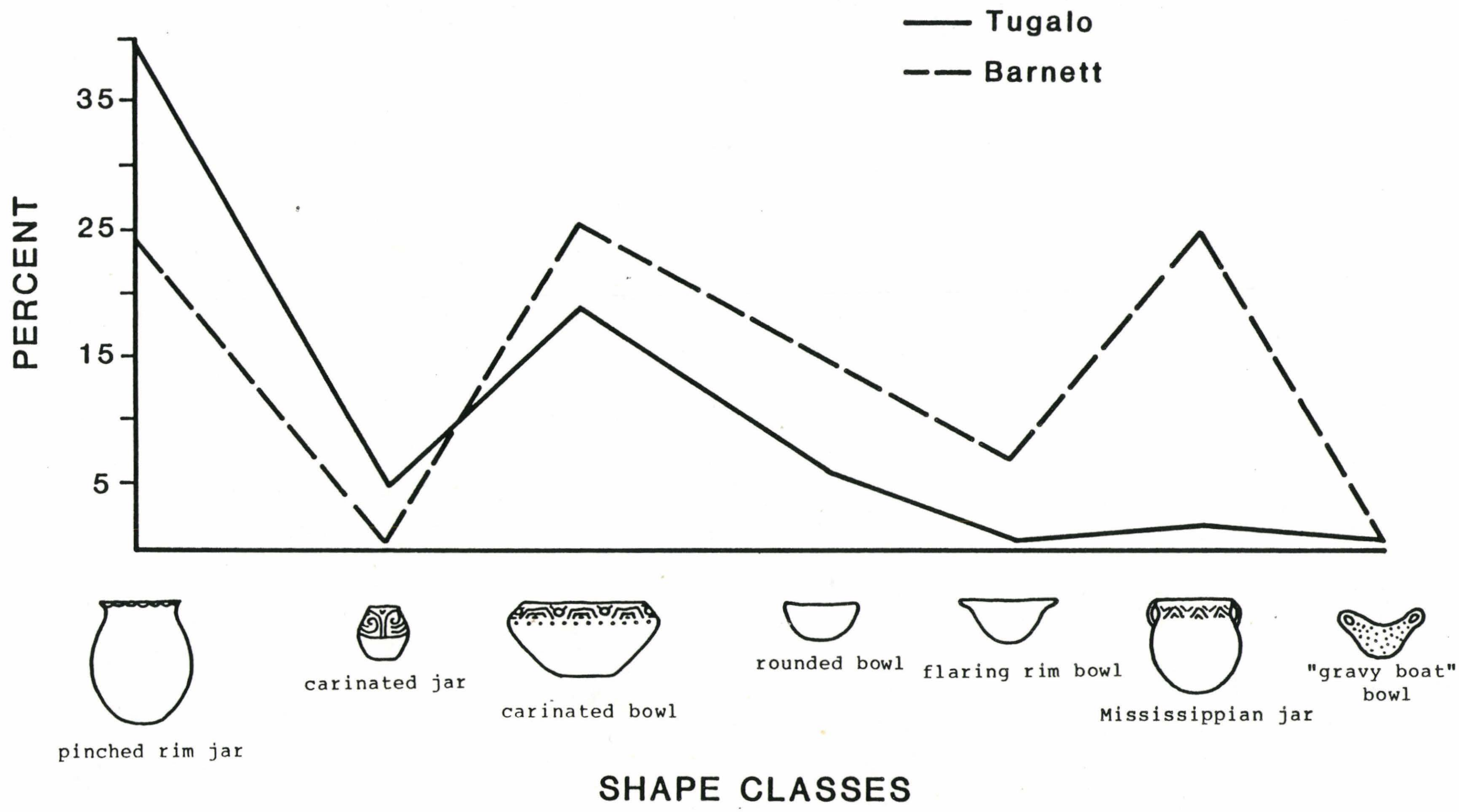

Figure 10. Comparison of Tugalo phase and Barnett phase vessel shape class frequencies.

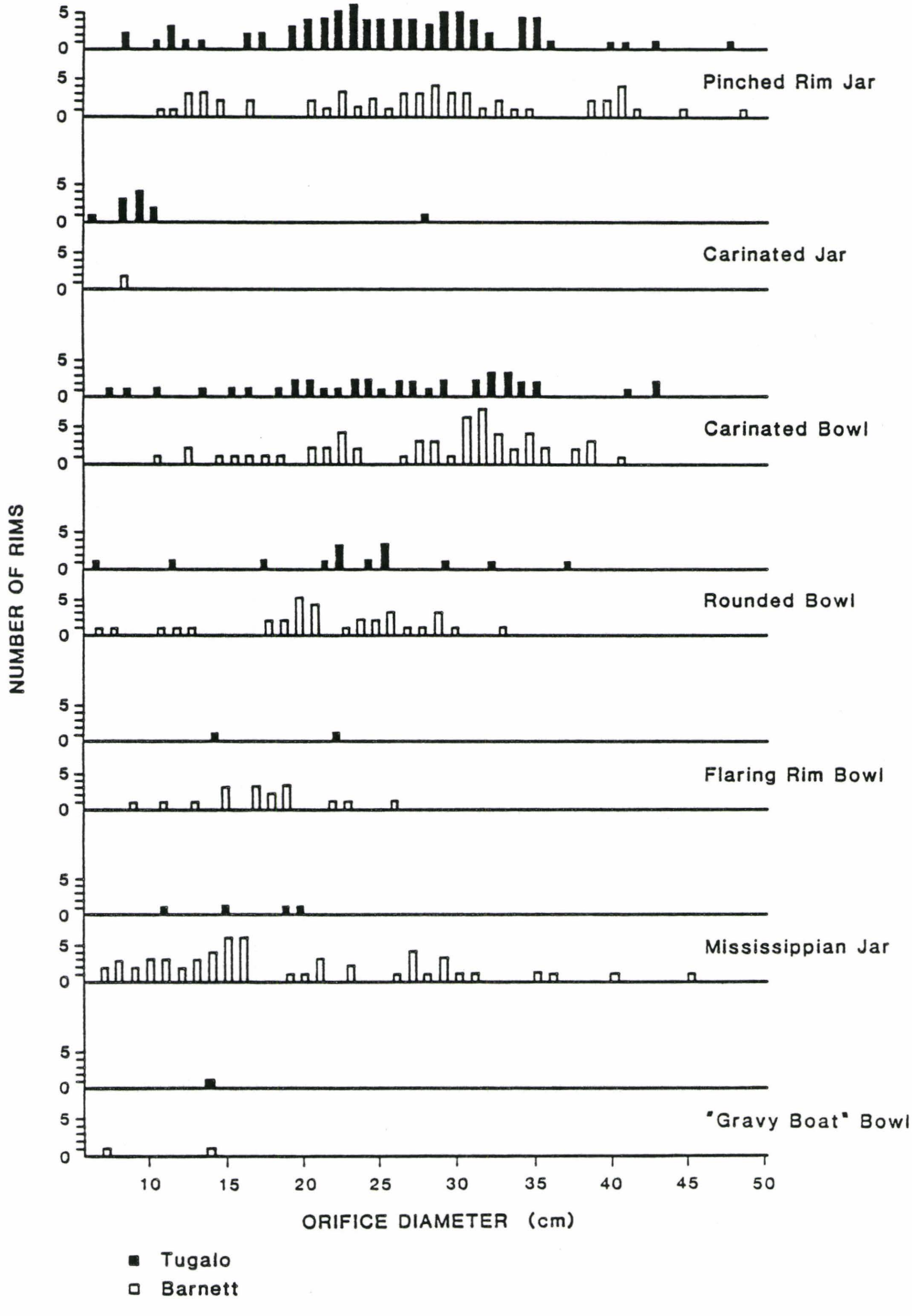

Figure 11. Comparison of Tugalo phase and Barnett phase size distributions of orifice diameters by vessel shape class.

Morphological Type	Orifice Diameter (cm) Tugalo	Barnett	Relative Frequency (%) Tugalo	Barnett
Small pinched rim jar	10-15	12-18	9.7	22.2
Medium pinched rim jar	18-38	22-36	85.3	57.4
Large pinched rim jar	42-50	40-50	4.7	20.4
Carinated jar*	8-12	10	100.0	100.0
Small carinated bowl	9-37	12-25	92.5	31.6
Large carinated bowl	43-45	28-42	7.5	68.4
Small rounded bowl	8-13	8-14	14.3	17.6
Large rounded bowl	19-39	19-34	85.7	82.4
Flaring rim bowl	16-24	10-27	100.0	100.0
Small Mississippian jar	12-21	8-17	100.0	60.7
Large Mississippian jar	0	20-46	0.0	39.2
"Gravy boat" bowl	14	7-14	100.0	100.0

*excluding the anomalous vessel

Table 8. Relative frequencies of vessel types for both the Tugalo phase and Barnett phase.

to have been made in a single size class in both assemblages.

Carinated bowl shape classes have equally wide ranges of orifice diameters in the Tugalo (36 cm) and Barnett (30 cm) phases. Two size classes are recognized in both collections. The two size classes in the Tugalo collection have orifice diameters ranging between 9-37 cm and 43-45 cm. However, within the small size class, there is a wide range between the smallest carinated bowl (9 cm) and the larger bowl at 37 cm. This wide range suggests not one, but two size classes. However, it is not clear where a separation should be made. Therefore, only two size classes for the Tugalo carinated bowl are recognized. Figure 11 shows that the most frequently represented sizes are those which fall in the middle size range for the Tugalo phase and the mid- to upper-range for the Barnett phase.

Rounded bowl shape classes are similar in both assemblages with respect to orifice diameter ranges. If the largest Tugalo rounded bowl at 39 cm, which may be an error in measurement, is excluded, rounded bowls have an equal orifice diameter range of 26 cm in both collections. The Barnett phase rounded bowl class has a bimodal distribution. The Tugalo phase appears to have a bimodal distribution, as well, based on the wide range of orifice diameters. However, if a small size class is recognized only two specimens would represent this class (8 cm and 13 cm). Percentages of vessels occurring in each of the size classes in both collections would be very similar as shown in Table 8. The low frequency with which the small size class occurs in the Barnett phase indicates that a division between small and large rounded bowls in the Tugalo phase is possible. A larger sample size is needed to confirm a bimodal distribution.

There are only two specimens of the flaring rim bowl in the Tugalo collection. Both fall within the orifice diameter range exhibited by the Barnett collection. The flaring rim bowl is considered to have a unimodal distribution in the Barnett phase. A larger sample is needed to determine size class distributions for the Tugalo phase flaring rim bowl.

As was previously stated, the frequencies of Mississippian jar shape classes differ considerably between the two collections. Two of the four vessels from Tugalo fall within the size range which occurs in a high frequency in Barnett (Figure 11). A bimodal distribution has been suggested for the Barnett phase Mississippian jars. With the small sample size from Tugalo such a determination cannot be made.

The single "gravy boat" bowl specimen from Tugalo has a maximum orifice diameter of 14 cm. This measurement falls within the size range of 7 cm to 14 cm for "gravy boat" bowls from Barnett. Unfortunately, this vessel type is not represented by many specimens in either collection.

In summary, the Tugalo phase and Barnett phase vessel assemblages are very similar with respect to shape classes, ranges of orifice diameter distributions, the number of size classes within each shape class, and the relative frequencies with which shared vessel shape classes occur. Specifically, seven out of a total of ten vessel forms are shared by both phases. These shared vessel forms appear to have approximately equivalent dimensions as indicated through orifice diameter measurements. These same vessel forms tend to have been made in the same number of size classes and share at least eleven, out of a total of twelve, vessel size classes. Furthermore, size classes are similar with respect to relative frequencies of occurrence (Table 8).

Similarities between both assemblages can be attributed to two factors. First, both the Tugalo and Barnett phases are contemporaneous and belong to the same ceramic tradition. This implies a sharing of culture traits. Some of these shared traits are manifested in the ceramic tradition characteristic of Lamar culture. Ceramics from both collections exhibit folded and applique pinched rims, bold incising, and complicated stamped motifs which are characterisitic of Lamar pottery types. Vessel shapes may also indicate another set of shared characteristics.

Second, ethnohistorical evidence shows that aboriginal food habits were fairly homogeneous in the seventeenth and eighteenth centuries throughout most of the Southeastern United States. Therefore, similarities in food habits should have resulted in similarities in vessel forms and vessel assemblages.

Differences between the two assemblages are few. They include three vessel shapes, the bottle, long neck jar, and cauldron, which are represented in only one assemblage. In addition, the relative frequencies of bowls and jars differ fairly substantially between the assemblages.

Jar forms occur in a greater frequency in the Tugalo assemblage. Combined frequencies of jars show that, in the Tugalo phase (pinched rim jars 39.3%; carinated jars 4.8%; Mississippian jars 1.9%; long neck jar 16.8%), there is an overall greater frequency of jar forms (62.8%) compared to the Barnett phase (50.8%). Figure 12 illustrates that if the long neck jar class is added to the non-pinched rim jar forms in the Tugalo collection, the frequencies of non-pinched rim jars become roughly the same in both assemblages: Tugalo (27.8%) and Barnett (25.0%).

Contrastingly, bowl forms occur in a greater frequency in the Barnett phase than the Tugalo phase. Combined bowl forms in the Barnett assemblage (carinated bowls 25.4%; rounded bowls 15.2%; flaring rim bowls 7.6%; "gravy boat" bowls 0.9%) total 49.1 %, as compared with Tugalo (27.1%).

Five of the seven shared vessel shapes: pinched rim jars, carinated bowls, rounded bowls, Mississippian jars, and "gravy boat" bowls occur with sufficient frequency in one or both assemblages that it is unlikely that differences in their frequencies can be attributed to sampling error.

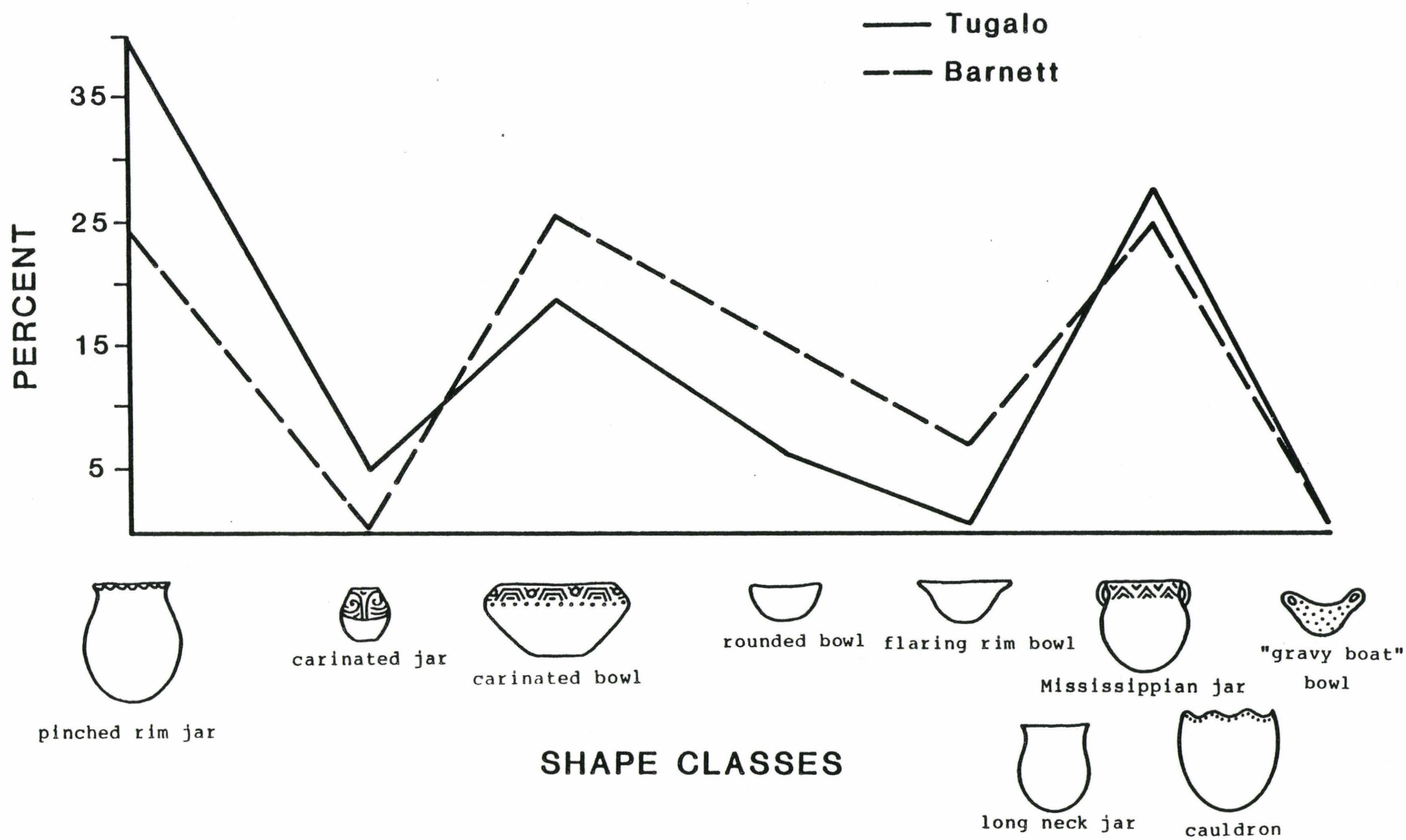

Figure 12. Comparison of Tugalo phase and Barnett phase vessel shape classes including long neck jars and cauldrons.

Sampling error, however, may account for frequency differences with the carinated jar and flaring rim bowl shape classes. Table 7 shows that Tugalo carinated jars are six times more common in the Tugalo phase than in the Barnett phase. This vessel form, however, occurs with such a low frequency that the low percentage in Barnett may reflect sampling error. Flaring rim bowls are seven times more frequent in the Barnett phase than the Tugalo phase. Again, this shape has a relatively low frequency of occurrence in both collections and the low percentage from Tugalo may be due to sampling error.

There are several factors which may account for these differences. These include spatial separation of both phases, the contexts from which the collections were obtained, and sampling error.

The Tugalo and Little Egypt sites are separated by a distance of approximately 100 km. This distance suggests that the Tugalo phase and Barnett phase were affiliated with different political and social groups. Although both phases were part of Lamar culture, interaction between both sites was probably limited. The Nacoochee site is the only late Lamar mound site known to exist in the area between the Tugalo and Little Egypt sites (see Figure 1). If cultural interaction between people from both the Tugalo and Little Egypt sites was limited, differences in ceramics can be expected.

One interesting, yet questionable, example of a stylistic difference between the two phases concerns the Tugalo phase long neck jar. This vessel shape occurs in a high frequency in the Tugalo phase assemblage and may be the morphological counterpart of the Barnett phase Mississippian jar. The Mississippian jar occurs in both assemblages but with a much greater frequency in Barnett. Archaeological evidence indicates that two large jar forms tend to occur on Late Mississippian period sites in the Southern Piedmont (Hally 1979, 1984; Smith 1981). The occurrence of two, relatively large, utilitarian jar shapes could perhaps be considered a pan-southeastern trait. Long neck jars and pinched rim jars in the Tugalo assemblage and Mississippian jars and pinched rim jars in the Barnett assemblage strongly support the evidence for two utilitarian jar forms. The fact that Mississippian jars are so infrequent in the Tugalo assemblage may be a result of farther distance from a Mississippian "sphere of influence". The Little Egypt site, located in a closer proximity to the the origins of Mississippian culture, placed more emphasis on the shell-tempered Mississippian jar.

The different contexts from which each collection was recovered is another factor which may account for differences between the assemblages. The Tugalo collection is comprised of vessels found in a mound refuse context. Barnett phase vessels were obtained from house floors which presumably reflect domestic activities, and to a lesser extent, from burials.

Although there is archaeological evidence demonstrating that the bottle is found throughout the Southeast, the bottle shape does not occur in the Tugalo collection. Its absence may be attributed to one of two factors. First, this vessel form occurs in an extremely low frequency in the Barnett collection. If the bottle is also an infrequent shape class at Tugalo, then the lack of this vessel form may be due to sampling error. Secondly, the bottle may not have been used in mound related activities at the Tugalo site and therefore was not recovered in a mound context.

Ethnohistorical accounts of mound activities are that such activities were ceremonial in nature. Ethnohistorical narratives summarized in Hudson (1976), Neitzel (1965), and Swanton (1946) associate platform mounds primarily with chiefs' residences, town houses, mortuary practices, and maintaining a sacred fire.

A chief's residence could be expected to have accommodated large numbers of people as well as providing large quantities of food. Town houses, situated atop earthen mounds, were popular with men for social and leisure activities and could hold as many as 500 people. Mortuary functions involved the preparation and curation of the dead and would have included funerary offerings, mainly food. Guardians of a sacred fire on the mound summit are reported as having lived in the temple in order that the fire be more securely maintained. This would have involved consumption of foodstuffs on the mound if not actual food preparation there as well.

Based on these observations, we can hypothesize that activities involving pottery on Mississippian platform mounds would differ from those occurring in village contexts. These differences would have included: 1) preparation and consumption of large quantities of foodstuffs for feasts; 2) preparation and/or consumption of special foods such as the black drink; and 3) little preparation of foodstuffs for domestic use.

The presence of the cauldron vessel type at the Tugalo site suggests the preparation and/or serving of large quantities of foodstuffs. One possible utilitarian purpose of the cauldron is the serving of black drink at ceremonial occasions. Ethnohistorical accounts (Hudson 1976) indicate that black drink was cooked in one vessel and then strained into another before serving. The absence of sooting on cauldrons, their large orifices, and the undulating rim which makes them unsuitable for storage, suggests that this vessel type may have functioned in this capacity. The only other evidence for cauldrons is at the Nacooche site. Again, this vessel type was found in a mound context. Although the actual use of cauldrons is not yet known, these vessels may reflect mound-related activities and therefore were not recovered from house floors such as at Little Egypt.

Lastly, chi-square tests were performed in order to account for the differences in jar and bowl frequencies between both assemblages. A test was first run on the total number of jar and bowl forms excluding the "gravy boat" bowl. Differences proved to be significant (Table 9). Subsequent tests were performed with jars and bowls derived from the various contexts in which vessels were recovered at the Little Egypt site: a mound structure (Structure 1); house floors (Structures 2 and 3); and burials. Although a small proportion of vessels had been recovered in a mound context at Little Egypt, differences between both Tugalo and Little Egypt mound contexts still proved to be significant.

Chi-square tests show that carinated bowls do not have as significant a difference in frequency as rounded and flaring rim bowls between the two assemblages. This indicates that the rounded and flaring rim bowls are the two most underrepresented bowl forms at Tugalo. The only difference which did not prove to be significant is the jar and bowl frequencies from the Tugalo mound and the Little Egypt burial contexts. The burials excavated at Little Egypt occurred in the village area and not in a mound context.

If the only similarity in jar and bowl frequencies between the assemblages can be found to occur between mound and burial contexts, how can this one similarity and the differences be accounted for? With respect to differences, the first possibility is that frequency differences may be due to sampling error. However, the chi-square test results

Site	# of Jars	# of Bowls
Tugalo	128	56
Barnett-all contexts	111	110
	x^2=15.5, p<.001, d.f.=1	
Tugalo	128	56
Little Egypt-structures	84	100
	x^2=21.5, p<.001	
Tugalo	128	56
Barnett-burials	26	9
	x^2=0.3, p<0.4	
Tugalo	128	56
Little Egypt-mound structure	14	30
	x^2=21.5, p<.001	
Tugalo	128	56
Little Egypt-Structures 2 & 3	70	70
	x^2=12.8, p<.001	
		Carinated bowls
Tugalo	128	40
Little Egypt structures	84	53
	x^2=7.8, p<.01	
		Rounded bowls
Tugalo	128	14
Little Egypt structures	84	30
	x^2=12.0, p<.001	
		Flaring rim bowls
Tugalo	128	2
Little Egypt structures	84	17
	x^2=17.6, p<.001	
		Rounded & flaring rim bowls
Tugalo	128	16
Little Egypt structures	84	47
	x^2=23.8, p<.001	

Table 9. Results of chi-square tests with jars and bowls.

disproves this with such statistically significant differences indicating that they cannot be due to random chance. A second hypothesis is that geographical distance may account for the differences. Even though the two assemblages represent two separate social and political groups, it seems unlikely that Tugalo phase people would use more jars and less bowls in the preparation, storage and consumption of food than their Barnett phase counterparts, especially if their food habits are similar. A third, and the most logical, hypothesis accounting for the difference in frequencies concerns the different contexts in which the collections were obtained. Tugalo phase ceramics were found in a mound-ceremonial context, whereas the majority of Barnett phase ceramics were found in a village-domestic context. Although it seems unlikely that the majority of food preparation would have occurred on the mound, the high frequency of jars may indicate the presence of a chief's residence where large numbers of people were being fed.

A fourth suggestion is that the "dump" represents village refuse and not mound-ceremonial refuse. It seems unlikely, however, that people would have dumped refuse on a ceremonial structure unless as fill in mound construction stages. This still does not account for the higher frequency of jars. Lastly, could jars which were used in the preparation of ceremonial foods have been "killed" after serving their functions? Possibly, but why would bowls not have been treated in a similar fashion? A final observation is that the only similarity in frequencies of jars and bowls is between the mound context at Tugalo and a burial context at Barnett (Table 9). This similarity suggests that the same types of vessels which are occurring in a "dump" context at Tugalo are being placed in a burial context at Barnett.

The differences in frequencies in jars and bowls between the two assemblages cannot be accounted for at the present. Although this thesis has shown that the two Southeastern vessel assemblages are very similar with respect to shape and size classes, further work is necessary to account for the one major dissimilarity in frequencies of jar and bowl forms between the Tugalo phase and Barnett phase vessel assemblages.

CHAPTER 8

SUMMARY AND CONCLUSIONS

From the ethnohistorical literature, it has been observed that food habits were fairly uniform throughout the Southeastern United States in the historic period. The similarities in food habits may have possibly extended back into earlier times as well. This thesis set out to test the hypothesis that similar food habits would be reflected in similar morphological vessel types. In order to test this hypothesis, a morphological analysis was performed with ceramics from a late Mississippian component at the Tugalo site in Northeast Georgia. Two primary tasks were to identify the full array of vessel types present in the collection, and to compare the Tugalo vessel shape and size classes with vessel types from the contemporary Barnett phase in Northwest Georgia.

An analysis of the Tugalo ceramics resulted in the recognition of the late Lamar Tugalo phase. The identification of the Tugalo phase as a regional variant of Lamar is based on stylistic attributes characteristic of late Lamar ceramics. Morphological analysis of the Tugalo ceramics resulted in the identification of nine different vessel shapes. Using orifice diameter measurements, size classes were identified in several of the shape classes. Altogether, fourteen shape and size classes, or morphological vessel types, were identified as constituting the Tugalo phase vessel assemblage. This assemblage and the assemblage defined by Hally (1982) for the Barnett phase were then compared.

This comparison showed that shape classes, as well as size classes, are very similar in both assemblages. Specifically, seven out of a total of ten vessel shapes are shared by both assemblages. Within these shared shape classes, eleven out of twelve morphological vessel types are shared as well and tend to occur in approximately similar frequencies.

Differences between the two assemblages include three vessel shapes not shared by both assemblages. The absence of two of the non-shared vessel shapes from both assemblages has been attributed to sampling error and/or to the context from which the vessels were obtained. The third non-shared vessel shape is suggested to be a stylistic equivalent of a Mississippian period utilitarian jar form.

The greatest difference between the two assemblages, and one that could not be accounted for, are the frequencies in which jar and bowl shapes occur. Using chi-square tests the frequencies were shown to be significantly different and are, therefore, not due to chance. Various hypotheses were offered as explanations, one of which concerned the differing contexts of the vessel collections, but none of these have proved satisfactory.

From ethnohistorical accounts, it has been suggested that food habits were similar throughout the Southeast. If vessel form reflects vessel function, then similar food habits would be reflected in similar vessel forms. The Tugalo phase and Barnett phase vessel assemblages were found to share an overwhelming number of similarities and, therefore, support this hypothesis. This hypothesis is further supported by the fact that what differences do occur could, for the most part, be accounted for. Unfortunately, the strength of the hypothesis is weakened by some or most of the similarities being attributed to common cultural heritage. Although both phases were, most likely, affiliated with separate political entities, both phases did belong to a single stylistic ceramic tradition: Lamar. In order to truly test the hypothesis, the ideal morphological comparison should involve non-Lamar vessel assemblages or two assemblages that are historically unrelated.

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