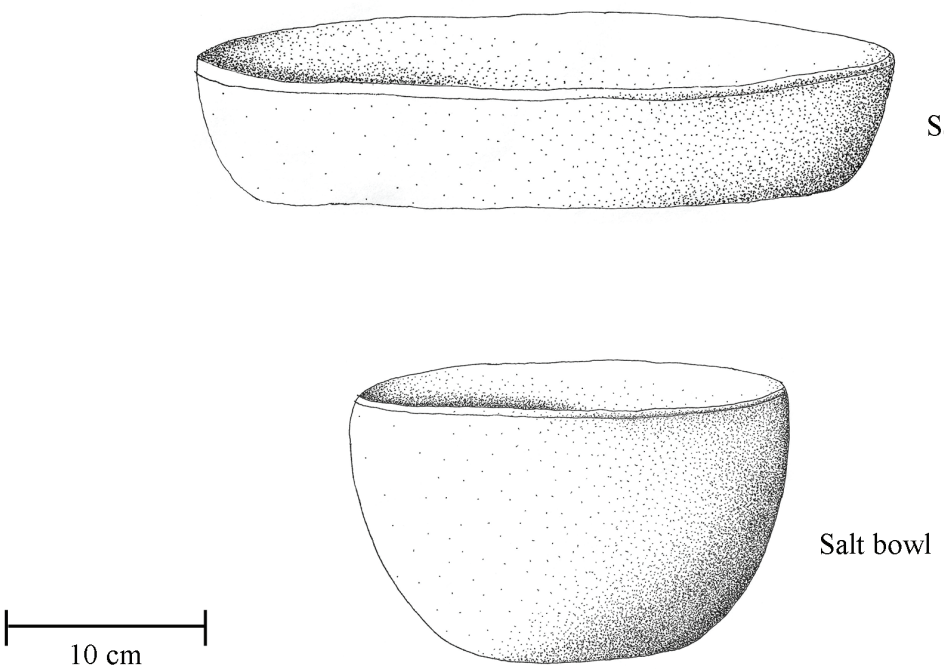
Caddo Archeology Journal



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Editor's Note:

The Caddo Archaeology Journal is now a peer-reviewed journal. In the past, there would be an informal peer review of articles, but now it is a requirement. All articles have to be reviewed by two people. We are grateful to the anonymous reviewers who gave of their time and effort to review the articles of this journal.

The Petrographic Analysis of Sherds from the Craig Mound at the Spiro site (34Lf40), the Moore #3/Ainsworth site (34Lf31), and the Geren site (34Lf36), LeFlore County, Oklahoma

Lori Barkwill Love, Steve A. Tomka, and Timothy K. Perttula

Introduction

James A. Brown (1971, 1996:329) commissioned James W. Porter (1971:244-246) to carry out a preliminary assessment of the paste of sherds from the Spiro site (34Lf40), as well as sherds from the nearby Geren (34Lf36) and Moore (34Lf31) sites. According to Brown (1996:329), Porter's goal was to "make assessments of the clay mineralogy and petrography of thin sections," specifically with an "interest in discriminating between (1) grog and grit temper and (2) shell and grog temper with shell inclusions." Twenty-nine thin sections were prepared, 27 from sherds from the Craig Mound, and one sherd each from the Moore/Ainsworth and Geren sites, both not far from Spiro (Brown 1996:Table 2-41; Peterson et al. 1993:Figure 4; Rohrbaugh 1985).

Shortly after Ferring and Perttula (1987) completed petrographic studies of red-slipped pottery from sites in Oklahoma and Texas, Brown offered to send the thin-sections from his Spiro area studies to Ferring for more detailed petrographic studies. This he did sometime in 1987, but the 29 thin-sections were never fully studied, and they languished for years at the University of North Texas. In 2012, Ferring relocated the thin-sections and corresponding sherds and sent them to Perttula to complete the petrographic analysis of the Spiro area sherd series. The results of the petrographic analysis of a total of 23 of the 29 thin-sections are discussed in this article; there are provenience issues with the other six thin-sections (see below).

Context of the Sherds

The sherds for petrographic analysis are from a variety of burial features in the Craig Mound at the Spiro site, as well as from unknown contexts in the excavations; House 2 at the Geren site (Rohrbaugh 1985); and from a test pit at the Moore site (Table 1). The sherds with known provenience from the Craig Mound date as early as A.D. 1000-1250 (Spiro I/II), in the Evans and Harlan phases, to A.D. 1250-1350 (Spiro III, Norman phase), and to the Spiro phase (Spiro IV and IVB, ca. A.D. 1350-1450) (Brown 1996:Figure 1-51). The Geren site sherd also dates to the Spiro phase. The Moore site dates to both Spiro phase and Fort Coffee phase (ca. A.D. 1450-1660, Rogers 2006) times.

Table 1. Provenience of the sherds from the Craig Mound at the Spiro site, the Geren site, and the Moore site.

Thin-Section No.	Catalog No./ SNOMNH*	Known provenience and Feature	Likely age of the sherd
Craig Mound, Spiro site (34Lf40)			
1	860	Unknown	-
2	135	Unknown	-
3	36	Burial #034	Sub-mound feature, Spiro I/II (Brown 1966:73, 1996:75,77)
5	856	Unknown	-
10	130	Burial #140	Spiro IV (Brown 1966:202-203, 1996:Figure 1-47)
11	856	Unknown	-
12	116	back dirt in mound	-
13	856	Unknown	-
14	251	Burial #099	Spiro III (Brown 1966:156-159; 1996:Figure 1-47)
15	856	Unknown	-
16	125	back dirt in mound	-
18	166	Burial #187	Spiro III, crematory basin (Brown 1966:255-256, 1996:75, 77, 751)
19	116	back dirt in mound	-
20	856	Unknown	-
21	43	Burial #145	Spiro IVB (Brown 1966:205-207, 1996:Table 2-154)
22	856	Unknown	-
23	109	Unknown	-
24	150	Burial #094	Spiro IV (Brown 1966:151-153, 1996:749)
25	790	Unknown	-
26	86	Unknown	-
27	66	Unknown	-
Geren (34Lf36)			
28	102	House #2	Spiro phase (Rohrbaugh1985; Peterson et al.1993:Table 1)
Moore #3/Ainsworth (34Lf31)			
29	118	Test Pit #3	Spiro and Fort Coffee phases (Peterson et al. 1993:Table 1; Rohrbaugh 2012)

*catalog number preceded by the trinomial, i.e., 34Lf40/0036

The catalog numbers listed on Table 1 do not correspond in every detail with the information provided in Brown (1996:Table 2-41). For this study, we relied on our decipherment of the catalog numbers written on the sherds; unfortunately, several sherds were so fragmentary that catalog numbers could not be deciphered, and in that case, its corresponding thin section could not be determined. This is why thin sections 4, 6-9, and 17 were not examined in this study.

The petrographic thin sections are from sherds of several different defined ceramic types, as classified by Brown (1996). These include Agee Incised (n=1), Bell Plain (n=1), LeFlore Plain (n=2), Nash Neck Banded (n=1), Poteau Plain (n=5), Redland Engraved (n=1), Sanders Plain (n=9), Spiro Engraved (n=1), Williams Plain (n=1), and Woodward Plain (n=1) (Table 2). The grog, grit, and bone-tempered ceramics (n=16, 70% of the thin-sections) include Agee Incised, LeFlore Plain, Nash Neck Banded, Redland Engraved, Sanders Plain, Spiro Engraved, and Williams Plain (Brown 1996:343-379, 401-403), while the shell-tempered ceramic types identified in this assemblage (n=7, 30% of the thin-sections) are Bell Plain, Poteau Plain, and Woodward Plain (Brown 1996:389-393, 405-406). The Bell Plain type is considered to be a Mississippi Valley type (Brown 1996:392), while the others are Arkansas River basin Caddo area ceramic types or in the case of Nash Neck Banded, the Red River basin in southeastern Oklahoma and northeastern Texas (Suhm and Jelks 1962:111).

Table 2. Pottery type identifications for the petrographic thin sections from the Craig Mound, the Geren site, and the Moore site (from Brown 1996:Table 2-41).

Petrographic thin-section no.	Pottery type
Spiro site, Craig Mound	
1	Sanders Plain
2	Sanders Plain
3	Williams Plain
5	Spiro Engraved
10	Poteau Plain
11	Sanders Plain
12	Sanders Plain
13	Redland Engraved
14	Bell Plain
15	Agee Incised
16	Sanders Plain
18	Poteau Plain
19	Poteau Plain
20	Poteau Plain
21	Sanders Plain
22	Sanders Plain
23	LeFlore Plain
24	LeFlore Plain
25	Sanders Plain
26	Poteau Plain
27	Sanders Plain
Geren site	
28	Nash Neck Banded
Moore site	
29	Woodward Plain

Results of the Petrographic Analysis

Methods

The thin sections were examined with a Leica Petrographic microscope with an attached mechanical stage. A two-step process was used to examine the thin sections. The first step involved recording their general characteristics and taking photomicrographs of the thin sections. The general characteristics recorded were paste matrix descriptions, paste color, b-fabric (Stoops 2003:95), and description of edges. B-fabric refers to the orientation and distribution of inference colors in the clay matrix (Stoops 2003:95). Examining the b-fabric can provide some insight into firing temperatures. According to Quinn (2013:191) it is generally assumed that an active b-fabric is related to ceramics that have been fired at temperatures less than 850° C, while an undifferentiated b-fabric is related to ceramics that have been fired at temperatures greater than 850° C. For the samples in this study, all but sample 28 from the Geren site had a slightly active b-fabric. Sample 28 had an undifferentiated b-fabric, suggesting it may have been fired at a slightly higher temperature.

Seven of the thin sections from the Spiro site (Nos. 1, 2, 3, 5, 10, 11, and 12) were not cut transverse to the plane of the sherd so that the edges of the vessel could not be described. By cutting a sherd transverse to the plane of the sherd, a slip or other surface treatments can be distinguished or described; however, given that several of the sherds were not cut transverse to the plane of the sherd and others were ground down too thin or had the edge eroded, a discussion of a slip or other surface treatments has not been included in this article. For the photomicrographs, at least two sets (plane light and cross-polar light) were taken of each thin section at 4x and 10x magnification. Digital images were captured using a Leica DFC 295 Digital Camera attached to a Dell computer.

The second step involved point counting using the Glagolev-Chayes method. The Glagolev-Chayes method involves using the mechanical stage, which allows one to move the thin section at a given interval beneath the crosshairs in the ocular, and identifying and recording each point encountered in the crosshairs (Galehouse 1971:389-390). For the point count sampling, the microscope was set at 10x magnification, and the stage was set so that the vertical and horizontal increments were both 0.4 mm. Each point encountered was identified as either paste matrix, void, or non-plastic inclusion. Paste matrix was recorded by tally; however, for all voids and non-plastic inclusions, estimated size and shape were recorded. Non-plastic inclusions and voids were only counted once even if the same void or inclusion was encountered more than once in the crosshairs. Once the point counting was completed, non-plastic inclusions that were noted during the scanning of the slide but not included in the point counting were recorded with a general estimate of their frequency.

Initially the thin sections were point counted until 100 paste points were reached. Stoltman (1989:151-152, 2012:H-1) suggests that a minimum of 100 points (exclusive of voids) are needed to ensure reliable results and that point counting in excess of 200 points yields redundancy. With 100 paste points counted, the minimum number of points recorded was 108, and the maximum number of points recorded was 168. However, in many of these thin sections, several of the inclusions had been "popped out," and the majority of the non-paste points recorded were voids, which do not provide much information regarding the temper in the sherds. Therefore, the point counting was repeated and increased to 200 paste points to ensure that a greater number of non-plastic inclusions were recorded. With the revised point counting, the minimum number of points recorded was 226 and the maximum number of points was 346. In the individual thin section descriptions, the percentage of voids that might represent "popped out" inclusions was recorded. The recording of missing inclusions was based primarily on the shape of the voids. The counts, measurements and

paste, voids, and non-plastic inclusion type recorded during point counting for each thin section were input into a JMP Pro 10 data table.

The maximum diameter of the inclusion/void was measured with the ocular scale to the nearest whole number. At 10x magnification, each tick mark on the ocular scale represents 0.02 mm. The raw tick mark count was recorded for each inclusion, input into JMP and converted to an actual size. Within each temper category, the distribution of sand size was noted by size category based on the Wentworth Grain Size scale (Table 3).

Table 3. Wentworth Grain Size scale used for distribution of sand size.

Size Category	Recorded Size
Silt	0.02-0.06 mm
Very Fine Sand	0.07-0.12 mm
Fine Sand	0.13-0.25 mm
Medium Sand	0.26-0.50 mm
Coarse Sand	0.51-1.0 mm
Very Coarse Sand	1.01-2.0 mm

Temper Categories

To assign temper categories to the thin-sections in the study, the recorded paste/inclusions were combined into the following simplified categories:

Recorded Paste/Inclusion	Simplified Inclusion Category
Paste	Paste
Bone	Bone
Sherd	Grog
Shell	Shell
Quartz	Sand
Polycrystalline quartz	Sand
Alkali feldspar	Sand
Muscovite	Mica
Calcium carbonate	Other
Clay pellet	Other
Hematite	Other
Opaque	Other
Organic	Other
Voids	Not included
Biotite	Mica
Calcite	Other
Chert	Sand
Mica Schist	Mica
Microcline	Sand
Secondary Calcite	Not included
Unknown	Other

A frequency distribution was created for each sherd based on the simplified inclusion category (voids and secondary calcite excluded) to determine temper categories. The "other" category was not used in temper assignments given that this category made up less than 5% of the inclusion categories. Eight temper categories were defined for these thin-sections: bone (n=4, 17%); bone and grog (n=5, 22%); grog (n=6, 26%); grog and sand (n=1, 4%); shell (n=4, 17%); shell and grog (n=1, 4%); shell, bone and grog (n=1, 4%); and micaceous sand (n=1, 4%). Grog was the most common category represented, followed by bone and grog (Figure 1).

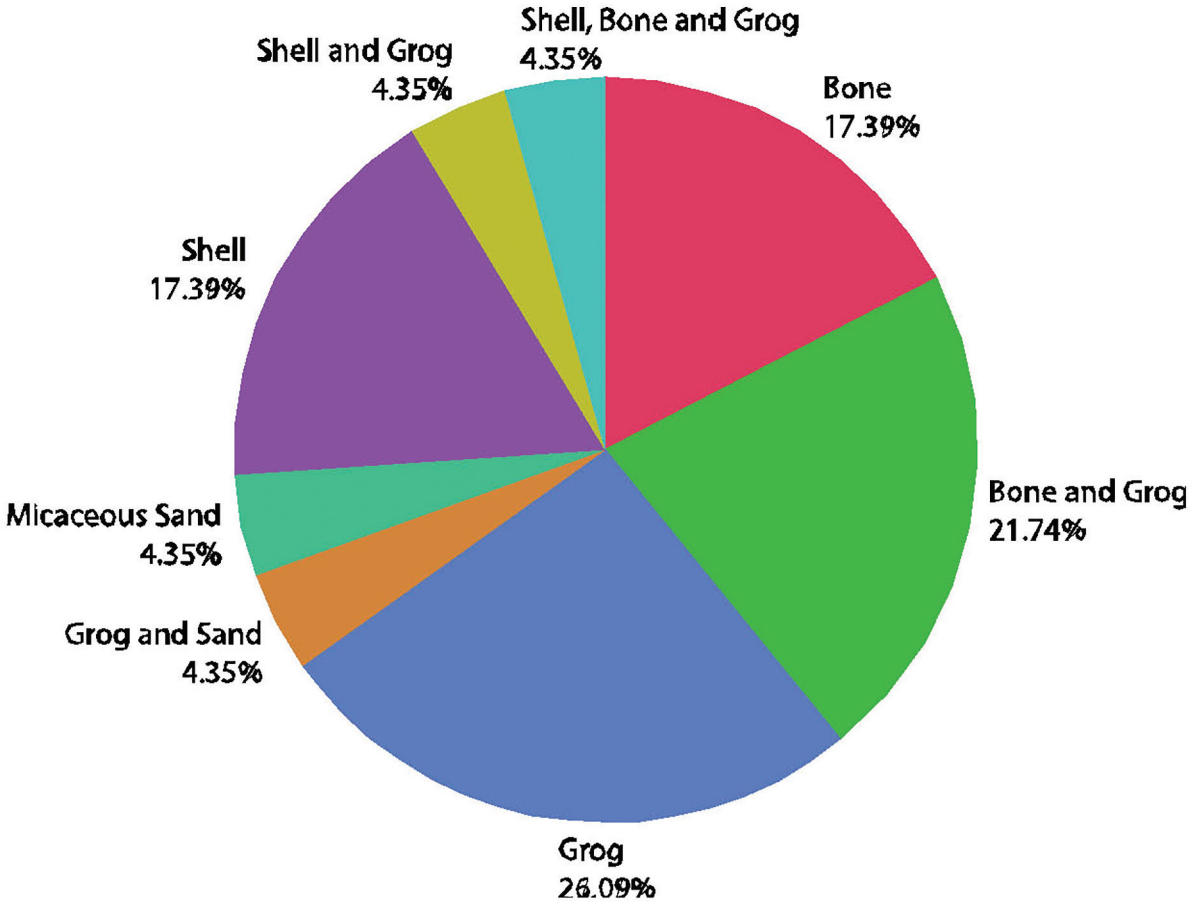

Figure 1. Distribution of temper categories.

Summary of Petrographic Analysis

Table 4 provides a general summary of the thin sections analyzed from the Spiro, Moore #3, and Geren sites. The table is divided by temper categories and provides an overview of the individual thin sections. The following is a description of the table columns:

Sherd ID: the ID number etched on the thin sections

Simplified Inclusion Categories (paste %, sand %, bone %, grog %, shell %, and mica %): lists the percentage of each category found during point counting. Note that the "other" inclusion category was omitted from this table.

Median Sand Size: represents the median size for the sand inclusions in the thin section.

Median Inclusion Size: represents the median size for all inclusions excluding sand and voids.

Platy Bone Inclusions: lists whether or not platy bone inclusions were common in the thin section. Y = platy-shaped bone was common, N = bone was generally not platy-shaped.

Platy Shell Inclusions: lists whether or not platy shell inclusions were common in the thin section. Y = platy-shaped shell was common, N = shell was generally not platy-shaped.

Common Inclusions (feldspar, mica, and hematite): lists whether or not these inclusions were common in the thin section based on visual inspection and not point counting. Y = inclusion was common, N = inclusion was not common.

Temper of Grog (sand, bone, shell, or grog):based on visual inspection, lists the temper commonly found in the grog. Y = temper type was commonly present, N = temper type was not present, P = temper type was present and the inclusions were often platy-shaped. In some of the thin sections only voids were represented in the crushed sherds; therefore, it was not possible to distinguish shell from bone, so both were recorded as being present.

Bone Temper

The bone temper category was defined on the presence of bone without grog or shell present in thin sections No. 13, 14, 19, and 26 from the Spiro site (see Table 4). The percentage of bone in this category ranged from 5.4% to 16.5%. A box plot of the bone size distribution by sherd No. is shown in Figure 2. Given the small sample size of the individual inclusions in each sherd, a statistical analysis comparing size differences was not warranted. The percentage of sand in this temper category ranged from 1.3% to 10.8%. Figure 3 shows the sand size distribution based on the Wentworth scale categories. Sand size is represented by a histogram rather than a box plot given that distinguishing silty sand from other sand categories is useful in determining whether the sand was a natural inclusion in the clay or intentionally added as temper. Since the majority of the sand in each of the thin sections is silt-sized, it is likely that the sand was a natural constituent in the clay for the samples in this category. However, the higher percentage of sand in thin section No. 19 (see Table 4) suggests this vessel was likely made with a sandier clay.

Of particular interest was the shape of the bone found in these thin sections. With the exception of thin section No. 13, the crushed bone was platy-shaped (Figure 4). This difference in bone shape could represent different ceramic vessel manufacturing processes.

Table 4. Summary of Petrographic Analysis.

		Simplified Inclusion Categories										Common Inclusions			Temper of Grog			
Sherd ID	Site	Paste %	Sand %	Bone %	Grog %	Shell %	Mica %	Mean Sand Size Index	Mean Inclusion Size Index	Platy Bone Inclusions	Platy Shell Inclusions	Feldspar	Mica	Hematite	Sand	Bone	Shell	Grog
Bone Temper																		
13	Spiro	80.65%	2.82%	16.53%	—	—	—	1.29 ± .76	3.68 ± 1.17	N	—	N	N	Y	_	_	_	_
14	Spiro	88.89%	1.33%	8.44%	—	—	0.44%	1	3.59 ± 1.22	Y	—	N	N	N	_	_	_	_
19	Spiro	83.33%	10.83%	5.42%	—	—	—	1.27 ± .53	3.57 ± 1.16	Y	—	Y	Y	Y	_	_	_	_
26	Spiro	84.03%	3.36%	12.19%	—	—	—	1.50 ± .76	3.79 ± 1.35	Y	—	Y	N	Y	_	_	_	_
Bone and Grog Temper																		
1	Spiro	69.93%	5.25%	22.03%	1.75%	—	—	1.33 ± .72	3.83 ± 1.40	N	—	N	N	Y	Y	Y	N	N
2	Spiro	88.50%	4.87%	0.00%*	6.20%	—	0.44%	1.27 ± .47	4.60 ± 1.24	N	—	Y	N	Y	Y	P	P	N
11	Spiro	87.34%	6.99%	1.75%	3.49%	—	—	1.13 ± .34	3.85 ± 1.86	N	—	N	Y	N	N	P	P	N
12	Spiro	85.47%	2.56%	5.98%	5.56%	—	—	1.33 ± .52	4.39 ± 1.23	N	—	Y	N	N	N	P	N	N
25	Spiro	81.30%	5.59%	4.88%	7.32%	—	0.81%	1.29 ± .61	3.59 ± 1.50	N	—	Y	Y	N	Y	Y	N	Y
Grog Temper																		
3	Spiro	94.79%	2.84%	—	1.90%	—	—	1	4.40 ± 1.52	—	—	N	N	Y	Y	N	N	N
5	Spiro	88.11%	6.61%	0.44%	4.41%	—	0.44%	1.20 ± .41	4.50 ± 1.73	N	—	N	Y	Y	Y	Y	N	N
15	Spiro	84.03%	10.91%	—	3.36%	—	0.42%	1.27 ± .53	4.25 ± 1.29	—	—	Y	Y	Y	Y	N	N	N
21	Spiro	89.29%	5.36%	—	4.91%	—	0.45%	1	4.58 ± 1.68	—	—	N	Y	N	Y	P	P	N
23	Spiro	85.11%	5.96%	—	7.66%	—	0.85%	1.36 ± 1.08	3.95 ± 1.20	—	—	N	Y	N	Y	N	N	Y
27	Spiro	88.11%	6.17%	—	5.73%	—	—	1.79 ± 1.63	4.75 ± .62	—	—	N	N	Y	N	P	P	N
Grog and Sand Temper																		
24	Spiro	66.23%	14.24%	—	16.56%	—	—	2.60 ± 1.14	3.92 ± 1.13	—	—	Y	N	Y	Y	N	N	Y
Shell Temper																		
10	Spiro	83.68%	2.93%	—	—	10.88%	—	1.86 ± .90	4.59 ± .98	—	N	Y	Y	Y	_	_	_	_
18	Spiro	70.67%	4.59%	—	—	24.74%	—	2.31 ± 1.25	3.76 ± 1.39	—	Y	Y	N	Y	_	_	_	_
20	Spiro	75.76%	4.55%	—	—	19.32%	—	1.75 ± 1.06	3.94 ± 1.09	—	Y	Y	Y	N	_	_	_	_
29	Moore	61.16%	3.06%	—	—	35.78%	—	1	3.96 ± 1.25	—	Y	N	Y	N	_	_	_	_
Shell and Grog Temper																		
22	Spiro	82.99%	3.73%	—	9.96%	3.32%	—	1.56 ± 1.67	4.63 ± .98	—	Y	N	N	Y	N	Y	Y	N
Shell, Bone, and Grog Temper																		
16	Spiro	72.46%	11.23%	2.54%	5.80%	6.88%	—	1.74 ± .82	3.73 ± 1.27	N	Y	Y	Y	Y	Y	Y	P	N
Micaceous Sand Temper																		
28	Geren	71.43%	13.21%	—	—	—	14.64%	3.03 ± 1.56	3.28 ± 1.33	—	—	Y	Y	N	_	_	_	_

*Bone is common even though it did not show up on point counting

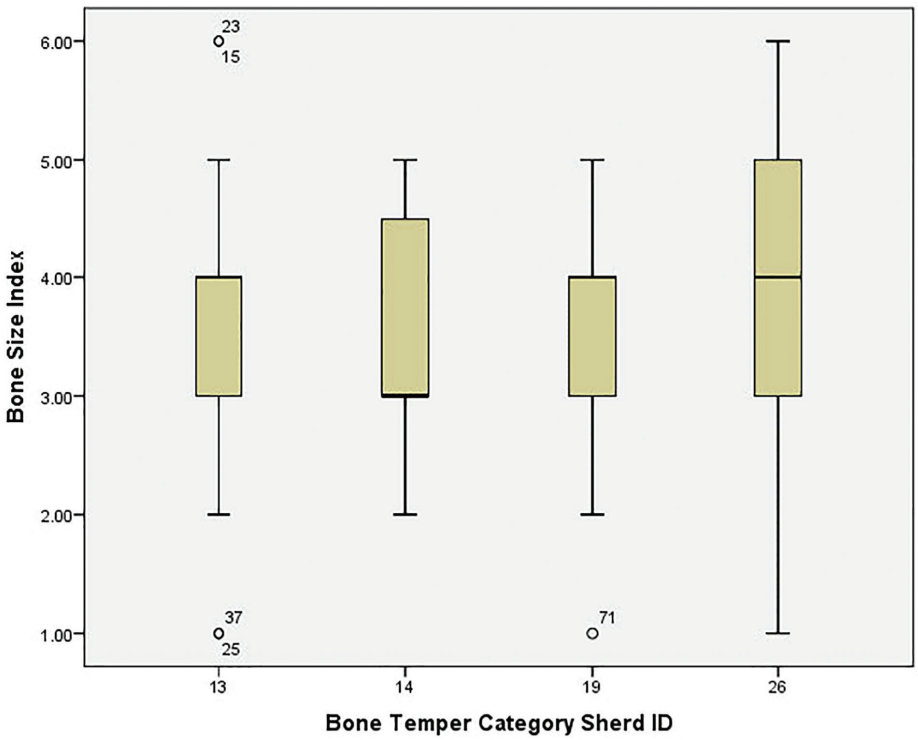

Figure 2. Box plot showing the bone size index for bone-tempered sherds by sherd No.

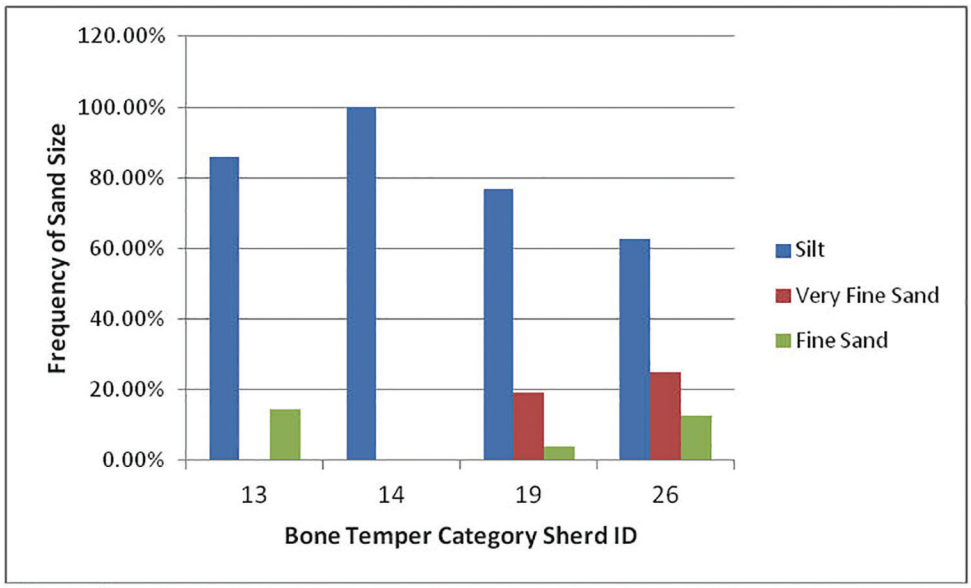

Figure 3. Distribution of sand size categories (based on the Wentworth scale) by sherd No. for bone-tempered sherds.

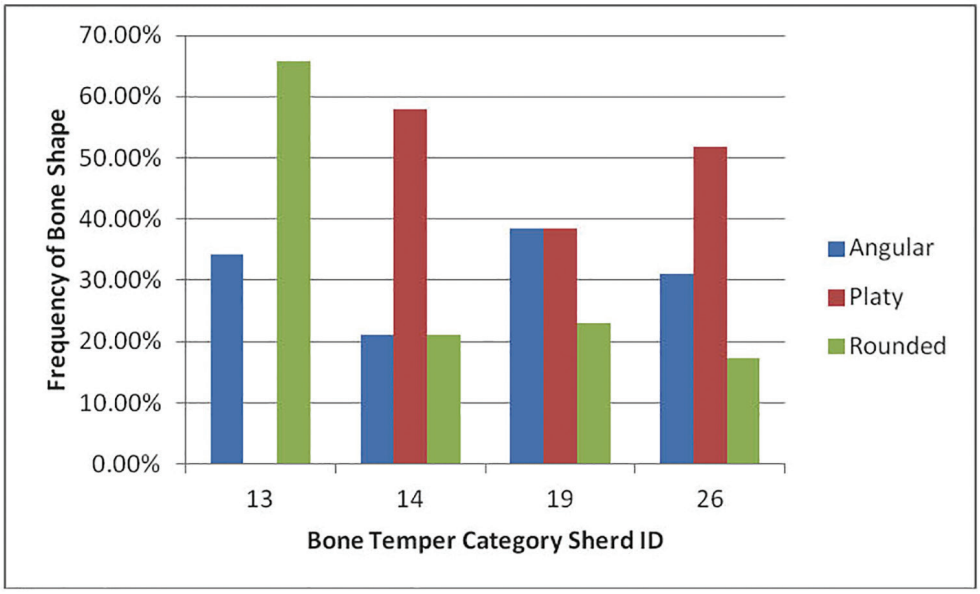

Figure 4. Distribution of crushed bone temper shape by Sherd No. for the bone-tempered sherds.

Sherd No. 13 (Figure 5a)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 2.5Y 6/6, olive yellow
B-fabric (XPL): Speckled/Slightly Active
Edge Description: One edge has a more active b-fabric. Same inclusions as rest of paste.
Comments: Most bone does not have platy shape. Some of the bone appears to have spots of hematite.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	75.5%	Paste	200	80.7%
Bone	41	15.5%	Sand	7	2.8%
Quartz	7	2.6%	Bone	41	16.5%
Voids	17	6.4%	**Total**	**248**	
Total	**265**				

Also present: polycrystalline quartz (common), hematite (common), charcoal (rare), muscovite (rare), alkali feldspar (rare)
Percentage of voids that might be missing inclusions: 82.4%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .24	.06	.02	.02
Bone	.06 – 1.5	.39	.34	.25
All Inclusions*	.02 – 1.5	.34	.26	.36

*Note: All inclusions includes all non-plastic inclusions but not voids

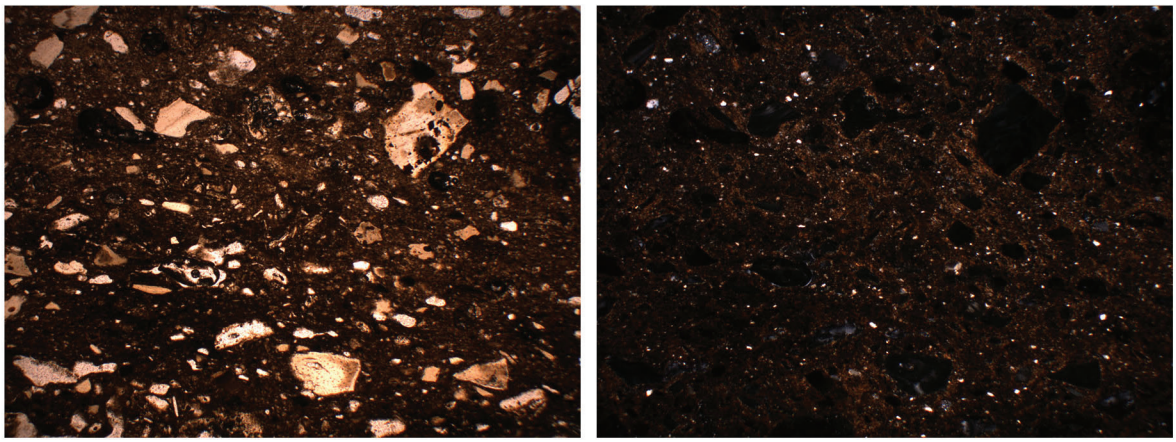

Figure 5a.

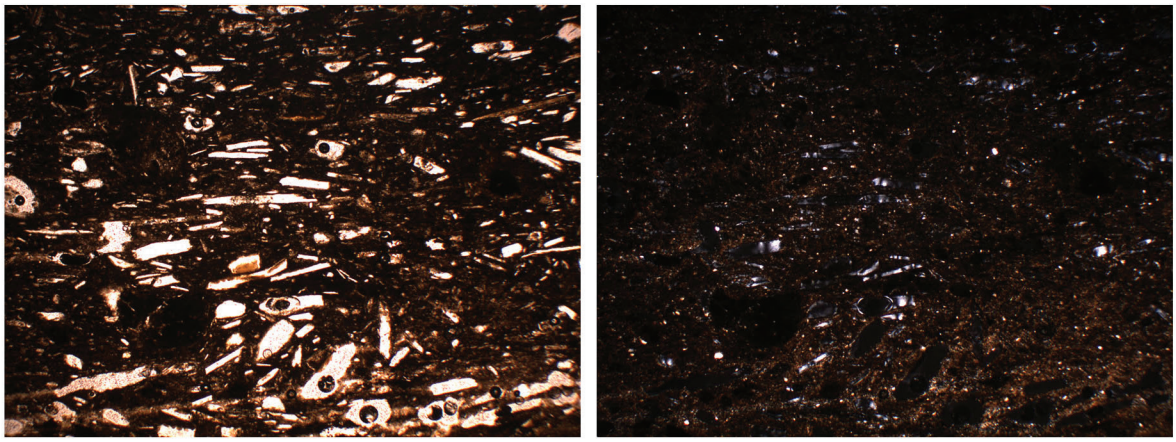

Figure 5b.

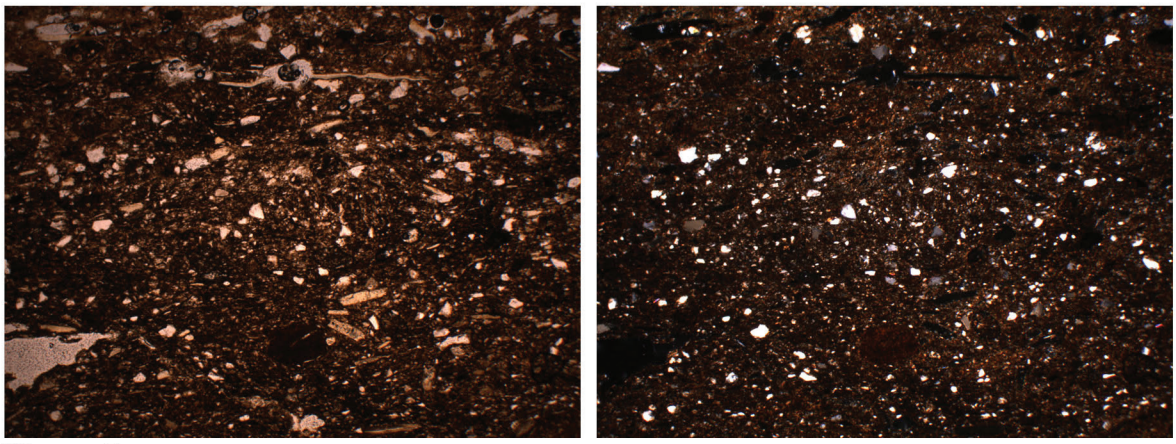

Figure 5c.

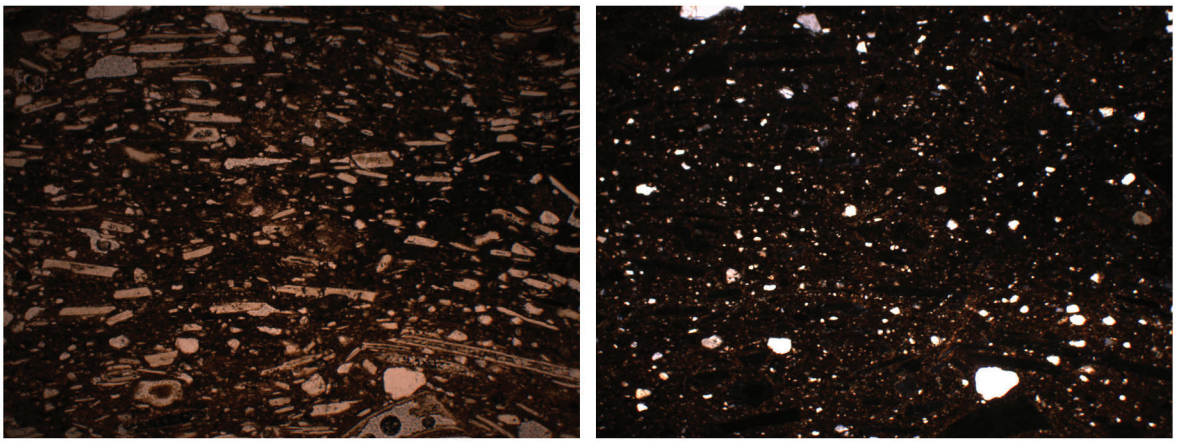

Figure 5d.

Figure 5. Photographs of bone-tempered thin sections: a, No. 13; b, No. 14; c, No. 19; d, No. 26. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Sherd No. 14 (Figure 5b)

Paste Matrix (PPL): Mottled

Paste Color (PPL): 2.5Y 4/3, olive brown with spots of 2.5Y 6/4, light yellowish-brown

B-fabric (XPL): Speckled/Slightly Active; Lighter paste is more active

Edge Description: Spots along one edge more active: same inclusions as rest of the paste

Comments: Bone mostly has platy shape. Inclusion generally oriented parallel to the rim.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	78.4%	Paste	200	88.9%
Bone	19	7.5%	Sand	3	1.3%
Quartz	3	1.2%	Bone	19	8.4%
Muscovite	1	0.4%	Mica	1	0.4%
Clay pellet	2	0.8%	Other	2	0.9%
Voids	30	11.8%	**Total**	**225**	
Total	**255**				

Also present: polycrystalline quartz (rare)

Percentage of voids that might be missing inclusions: 80%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .06	.04	.04	.04
Bone	.08 – .94	.34	.22	.36
All Inclusions	.02 – 1.5	.34	.26	.36

Sherd No. 19 (Figure 5c)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 10YR 5/6, yellowish brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: Both edges are rubbed a little thin and are lighter in color (2.5Y 7/6 yellow) and more active
Comments: Clay pellet may be grog without distinctive temper (sand). Most bone has a platy shape and is oriented parallel to the rim.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	79.4%	Paste	200	83.3%
Bone	13	5.2%	Sand	26	10.8%
Quartz	22	8.7%	Bone	13	5.4%
Polycrystalline quartz	4	1.6%	Other	1	0.4%
Clay pellet	1	0.4%	**Total**	**240**	
Voids	12	4.8%			
Total	**252**				

Also present: muscovite (common), hematite (common), alkali feldspar (uncommon), plagioclase (uncommon), shell (uncommon)
Percentage of voids that might be missing inclusions: 58.3%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.04 – .16	.06	.06	.03
Bone	.06 – .70	.31	.26	.27
All Inclusions	.04 – .70	.16	.06	.17

Sherd No. 26 (Figure 5d)

Paste Matrix (PPL): Continuous with core
Paste Color (PPL): 10YR 5/6, yellowish brown – core: 10YR 4/3, brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: Possible slip – one edge has spots (not continuous) of 7.5YR 4/6, strong brown – unlike the rest of the paste these spots do not have any bone present, just sand. The other edge is ground too thin.
Comments: A large area in the middle of the thin section is missing; this area was skipped during point counting. Most of the bone/voids are platy-shaped and oriented parallel to the rim. There are spots of hematite on the bone. Hematite is common in the thin section.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	77.2%	Paste	200	84.0%
Bone	29	11.2%	Sand	8	3.4%
Quartz	8	3.1%	Bone	29	12.2%
Hematite	1	0.4%	Other	1	0.4%
Voids	21	8.1%	**Total**	**238**	
Total	**259**				

Also present: alkali feldspar (common), polycrystalline quartz (rare), muscovite (rare)
Percentage of voids that might be missing inclusions: 66.7%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .14	.07	.06	.07
Bone	.06 – 2.56	.47	.34	.49
All Inclusions	.02 – 2.56	.39	.27	.49

Bone and Grog Temper

The bone and grog temper category was defined on the basis of the presence of bone and grog with little to no shell. The bone and grog temper category represented 21.7% of the samples (see Table 4).

The percentage of bone ranged from 0% to 22%. Although thin section No. 2 had no bone sampled during point counting, bone was common in the thin section; therefore, it was placed in this temper group. A box plot of the bone size distribution by sherd No. is shown in Figure 6. Unlike the bone temper category, the majority of the crushed bone in the thin sections were not platy-shaped, which may represent differences in manufacturing processes between vessels (Figure 7). Although the majority of the crushed bone in the thin section did not have a platy shape, the bone/shell in the crushed sherds used as temper was often platy shaped in all the thin sections except in thin sections No. 1 and No. 25. In some of the thin sections, the inclusions in the crushed sherds were represented by voids instead of actual inclusions; therefore, it was difficult to distinguish between bone and shell inclusions. The mix of temper preparation techniques within the sherd has some interesting implications for recycling of broken vessels or suggests some flexibility in manufacture techniques.

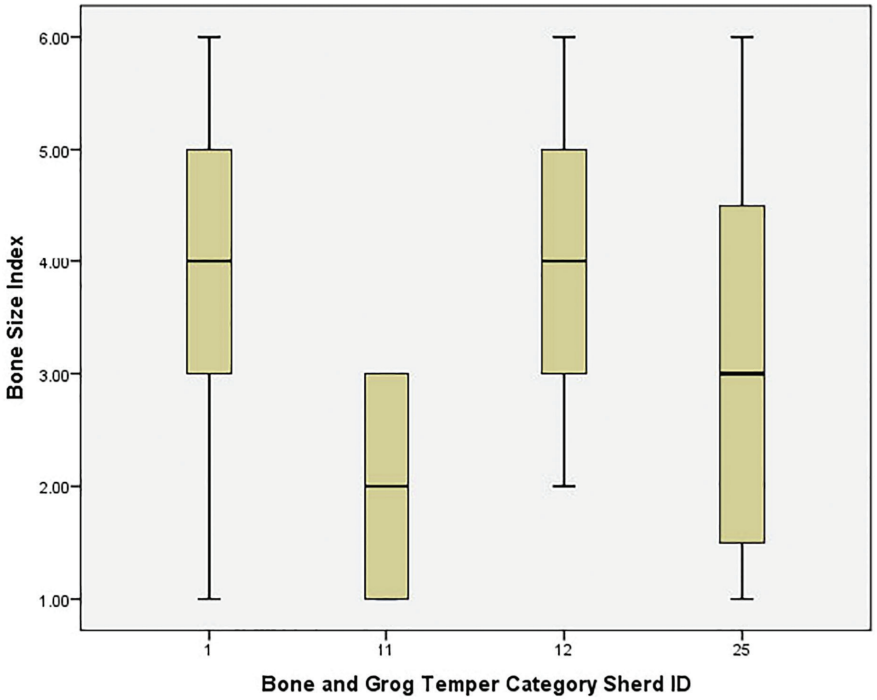

Figure 6. Box plot showing distribution of bone size by sherd No. for bone-grog-tempered sherds. Thin section No. 2 is omitted due to no bone being sampled in the point counting.

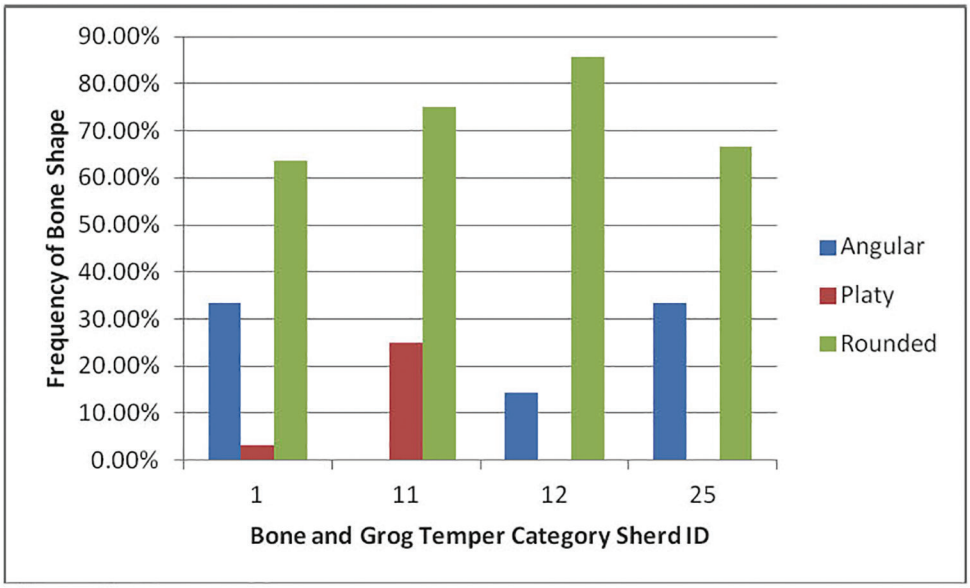

Figure 7. Distribution of the crushed bone shape by Sherd No. Thin section No. 2 is omitted due to no bone being sampled in the point counting.

The percentage of grog in this temper category ranged from 1.8% to 7.3%. A box plot of the grog size distribution based on the size index by sherd No. is shown in Figure 8. The percentage of sand in this temper category ranged from 2.56% to 6.99%. Figure 9 shows the sand size distribution based on the Wentworth scale. Given that the majority of the sand in each of the thin sections is silt sized, it is likely that the sand was a natural constituent element in the clay for all the samples in this category.

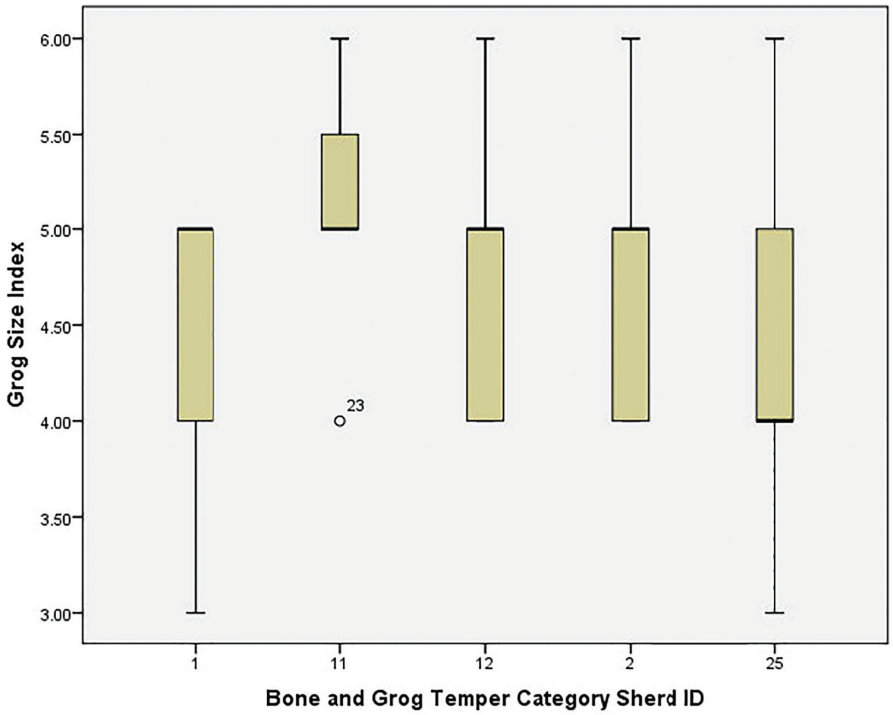

Figure 8. Box plot showing grog size distribution by sherd No.

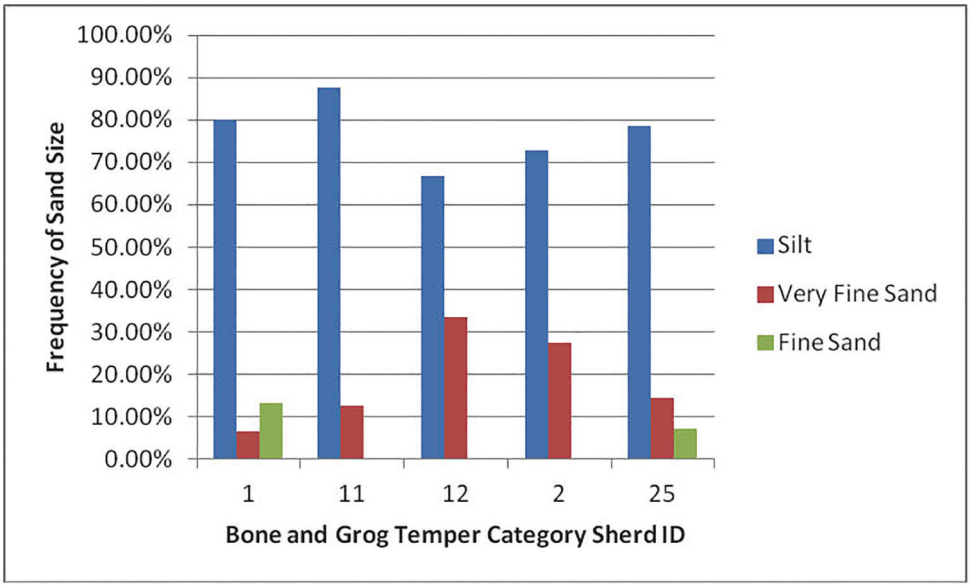

Figure 9. Distribution of the sand size category (based on the Wentworth scale) by sherd No. for bone-grog- tempered sherds.

Sherd No. 1 (Figure 10a)

Paste Matrix (PPL): Continuous

Paste Color (PPL): 10YR 4/4, dark yellowish brown

B-fabric (XPL): Speckled/Slightly Active

Edge Description: N/A

Grog Description: Generally tempered with bone. Most bone temper was not platy-shaped. Many of the crushed sherds seemed to have the same paste as the thin section.

Comments: Most bone temper was not platy-shaped. Opaques were possibly burnt bone or hematite.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	66.2%	Paste	200	69.9%
Bone	63	20.9%	Sand	15	5.2%
Grog	5	1.7%	Bone	63	22.0%
Quartz	14	4.6%	Grog	5	1.8%
Alkali feldspar	1	0.3%	Other	3	1.1%
Opaque	3	1.0%	**Total**	**286**	
Voids	16	5.3%			
Total	**302**				

Also present: hematite (common), muscovite (uncommon), polycrystalline quartz (uncommon), small mafic mineral (rare)

Percentage of voids that might be missing inclusions: 12.5%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .16	.06	.04	.04
Bone	.04 – 1.90	.52	.40	.54
Grog	.18 – .94	.56	.58	.48
All Inclusions	.02 – 1.90	.43	.32	.55

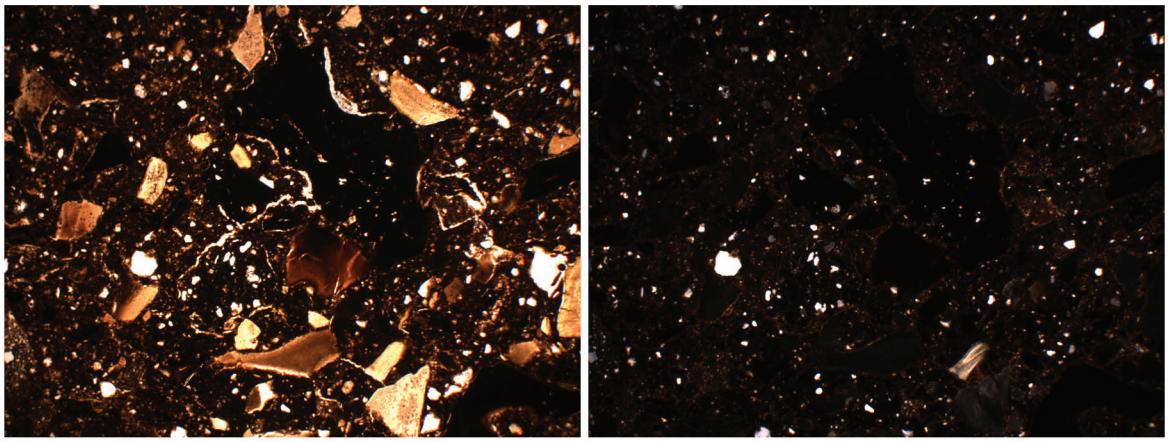

Figure 10a.

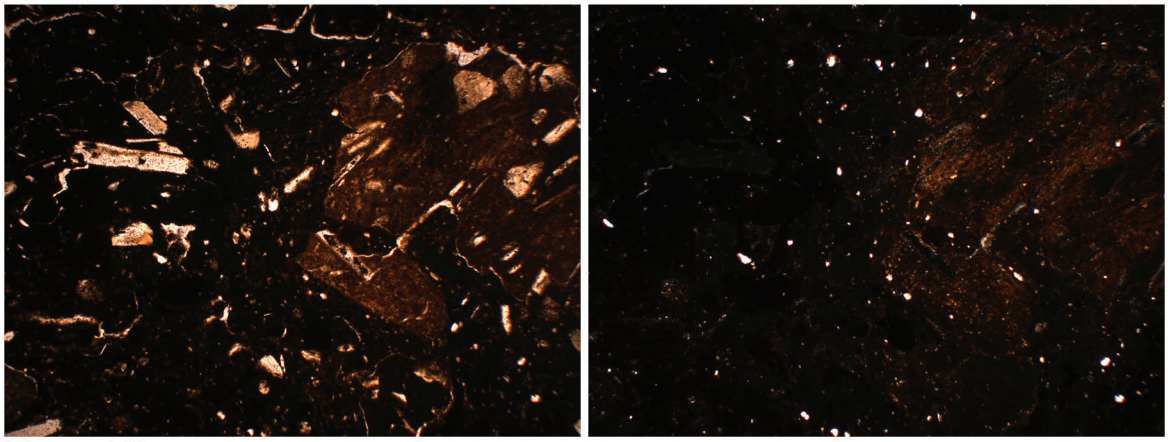

Figure 10b.

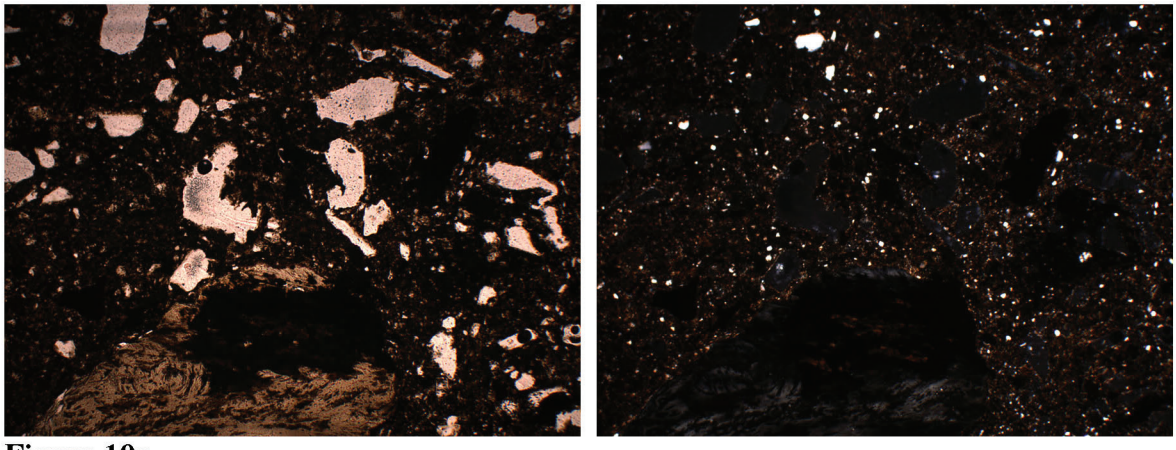

Figure 10c.

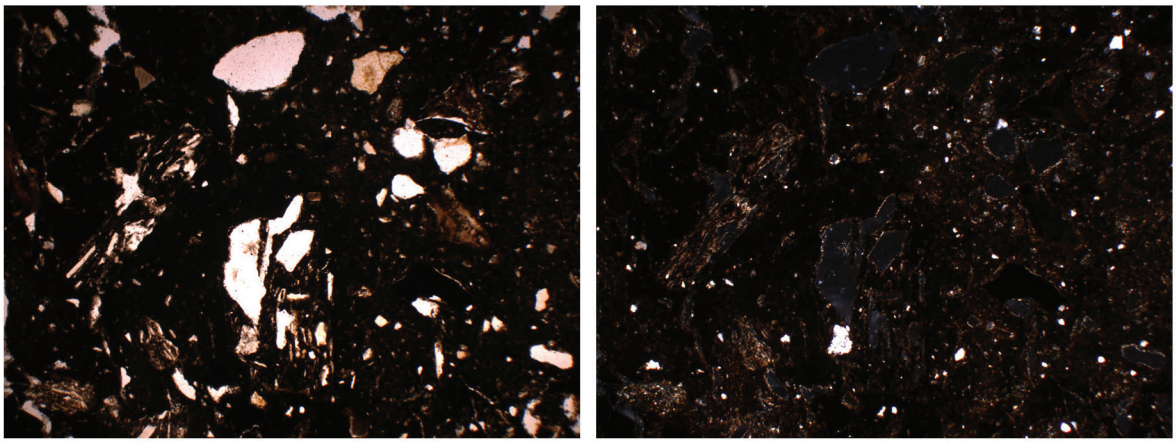

Figure 10d.

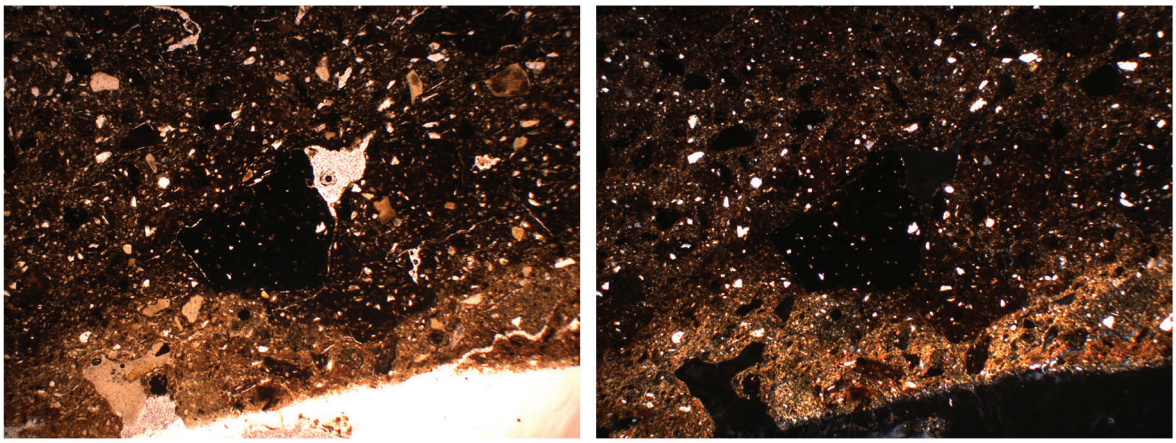

Figure 10e.

Figure 10. Photographs of bone-grog-tempered thin sections: a, No. 1; b, No. 2; c, No. 11; d, No. 12; e, No. 25. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Sherd No. 2 (Figure 10b)

Paste Matrix (PPL): Mottled

Paste Color (PPL): 2.5Y 5/4, light olive brown with spots of 2.5Y 3/3, dark olive brown

B-fabric (XPL): Speckled/Slightly Active – dark spots undifferentiated

Edge Description: N/A

Grog Description: Generally tempered with bone/shell or sand. Bone/shell temper is mostly platy. Many of the crushed sherds have the same paste as the thin section.

Comments: Secondary calcite maybe an artifact of the thin section production.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	82.3%	Paste	200	88.5%
Grog	14	5.8%	Sand	11	4.9%
Quartz	9	3.7%	Grog	14	6.2%
Alkali feldspar	2	0.8%	Mica	1	0.4%
Muscovite	1	0.4%	**Total**	**226**	
Voids	15	6.2%			
Secondary calcite	2	0.8%			
Total	**243**				

Also present: bone (common), hematite (common)
Percentage of voids that might be missing inclusions: 33.3%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .12	06	.04	.08
Grog	.26 – 1.50	.72	.65	.63
All Inclusions	.02 – 1.50	.41	.26	.66

Sherd No. 11 (Figure 10c)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 2.5Y 5/4, light olive brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: N/A
Grog Description: Generally tempered with bone or possibly shell. Several of the crushed sherds had inclusions with platy structure.
Comments: Most visible bone and possible missing inclusions were not platy-shaped. Opaque might be burnt bone.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	78.4%	Paste	200	87.3%
Bone	4	1.6%	Sand	16	7.0%
Grog	8	3.1%	Bone	4	1.8%
Quartz	15	5.9%	Grog	8	3.5%
Polycrystalline quartz	1	0.4%	Other	1	0.4%
Opaque	1	0.4%	**Total**	**229**	
Voids	26	10.2%			
Total	**255**				

Also present: muscovite (common), alkali feldspar (uncommon), shell (uncommon), charcoal (rare)
Percentage of voids that might be missing inclusions: 76.9%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .08	.04	.04	.04
Bone	.06 – .18	.12	.11	.12
Grog	.46 – 1.14	.79	.75	.44
All Inclusions	.02 – 1.14	.26	.06	.47

Sherd No. 12 (Figure 10d)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 2.5Y 4/4, olive brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: N/A
Grog Description: Generally tempered with bone or sand. Several of the crushed sherds had platy-shaped bone temper.
Comments: Bone in thin section not platy-shaped.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	81.6%	Paste	200	85.5%
Bone	14	5.7%	Sand	6	2.6%
Grog	13	5.3%	Bone	14	6.0%
Quartz	6	2.4%	Grog	13	5.6%
Opaque	1	0.4%	Other	1	0.4%
Voids	11	4.5%	**Total**	**234**	
Total	**245**				

Also present: alkali feldspar (common), polycrystalline quartz (common), plagioclase (uncommon), muscovite (uncommon), charcoal (rare)
Percentage of voids that might be missing inclusions: 72.7%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .12	.06	.05	.07
Bone	.08 – 1.38	.55	.42	.77
Grog	.28 – 1.80	.84	.72	.74
All Inclusions	.02 – 1.80	.56	.43	.77

Sherd No. 25 (Figure 10e)

Paste Matrix (PPL): Continuous (core)
Paste Color (PPL): 10YR 5/6, yellowish brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: Edges are lighter (2.5Y 7/8, yellow) and more active in XPL, but have the same inclusions as the rest of the paste
Grog Description: Generally tempered with sand, bone, or grog. Bone in crushed sherds is not platy-shaped.
Comments: Muscovite is very common. Bone is not platy-shaped. Hematite is present.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	78.1%	Paste	200	81.3%
Bone	12	4.7%	Sand	14	5.7%
Grog	18	7.0%	Bone	12	4.9%
Quartz	13	5.1%	Grog	18	7.3%
Polycrystalline quartz	1	0.4%	Mica	2	0.8%
Muscovite	2	0.8%	**Total**	**246**	
Voids	10	3.9%			
Total	**256**				

Also present: perthite (rare), alkali feldspar (common), small mafic mineral (augite) (rare)
Percentage of voids that might be missing inclusions: 40%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .18	.06	.04	.03
Bone	.06 – 1.80	.39	.21	.50
Grog	.14 – 1.32	.48	.35	.42
All Inclusions	.02 – 1.80	.31	.18	.35

Grog Temper

The grog temper category was based on the presence of grog without bone or shell inclusions. However, it should be noted that thin section No. 5 did have one piece of bone sampled during point counting. As bone temper in this thin section was very rare, it was placed in this category. Also thin section No. 21 may be bone and grog tempered; however, no bone was observed in the thin section, yet there were several voids that could possibly be bone based on their shape. The grog temper category represented 26.1% of the samples (n=6), all from the Spiro site (see Table 4).

The percentage of grog in this category ranged from 1.9% to 7.7%. Figure 11 is a box plot showing the distribution of grog size based on the size index. While all of the thin sections in the bone and grog temper category had grog (crushed sherds) with bone/shell inclusions, in the grog temper category, only three thin sections (No. 5, No. 21, and No. 27) had crushed sherds with bone/shell. Only two (No. 21 and No. 27) thin sections had crushed sherd with platy bone/shell inclusions. The remaining thin sections contained crushed sherds with sand (No. 3 and No. 15) and sand and grog (No. 23).

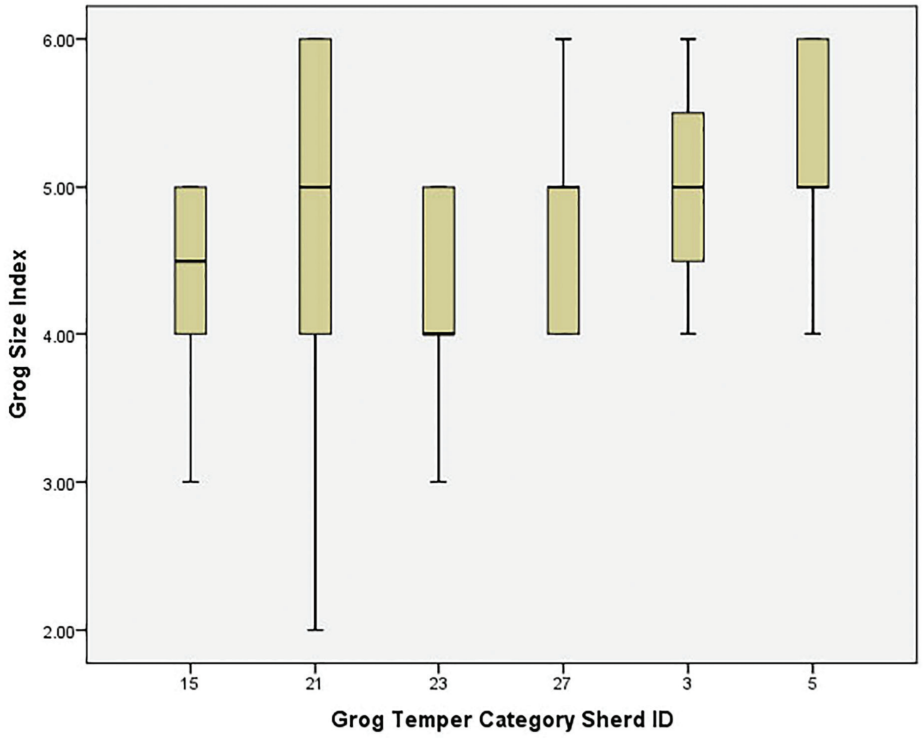

Figure 11. Box plot of the size index for grog by sherd No. for grog-tempered sherds.

The percentage of sand in the grog-tempered thin sections ranged from 2.8% to 10.9%. Figure 12 shows the sand size distribution based on the Wentworth scale. Although there is a greater range of sand sizes in this temper category, the majority of the sand is silt size suggesting that the sand was a natural inclusion in the clay.

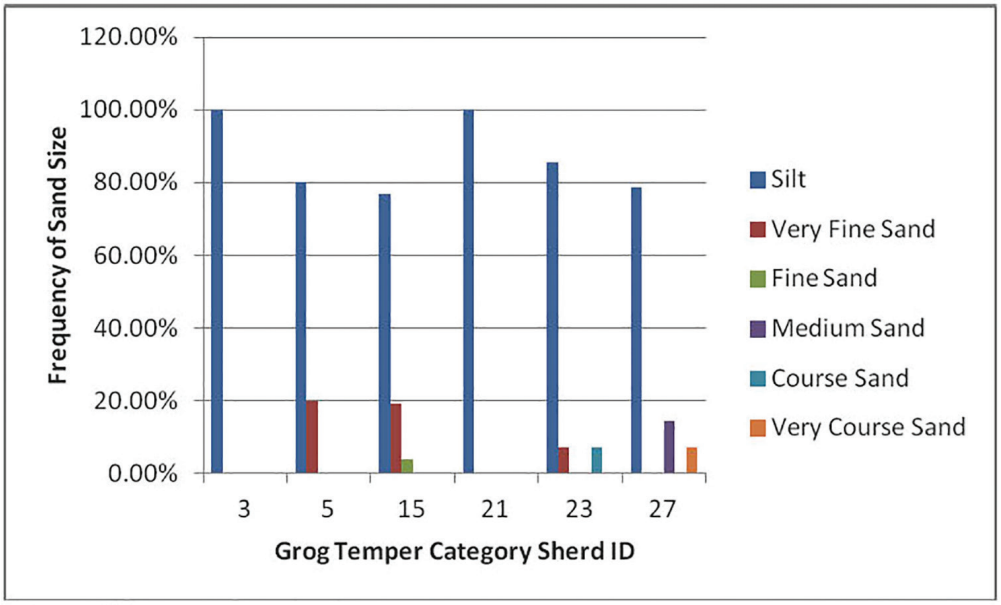

Figure 12. Distribution of sand size based on the Wentworth scale for the grog-tempered sherds.

Sherd No. 3 (Figure 13a)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 7.5YR 6/8, reddish yellow
B-fabric (XPL): Speckled/Slightly Active
Edge Description: N/A
Grog Description: Generally tempered with sand. Similar paste as thin section.
Comments: Few inclusions

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	88.5%	Paste	200	94.8%
Grog	4	1.8%	Sand	6	2.8%
Quartz	6	2.7%	Grog	4	1.9%
Hematite	1	0.4%	Other	1	0.5%
Voids	15	6.6%	**Total**	**211**	
Total	**226**				

Also present: muscovite (uncommon), polycrystalline quartz (rare)
Percentage of voids that might be missing inclusions: 13.3%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .06	.03	.02	.03
Grog	.36 – 1.02	.76	.83	.55
All Inclusions	.02 – 1.02	.30	.06	.70

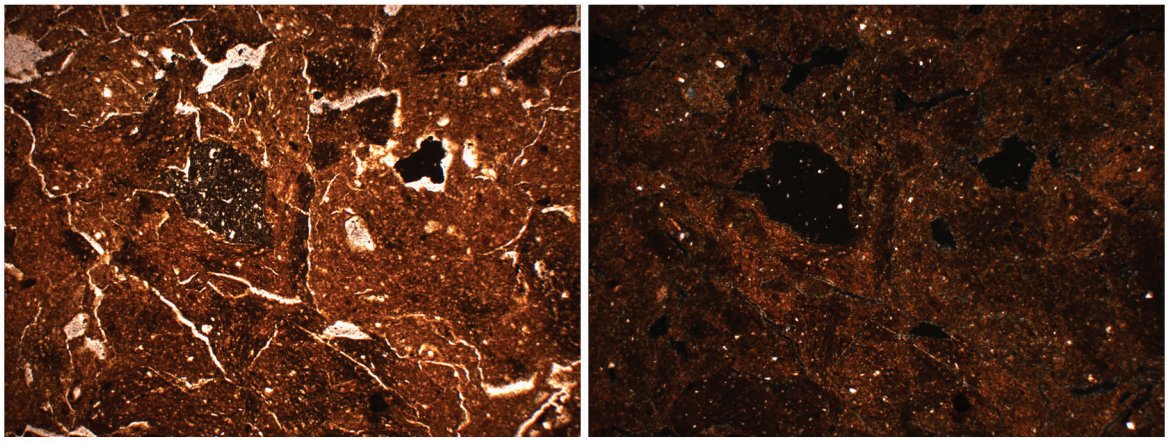

Figure 13a.

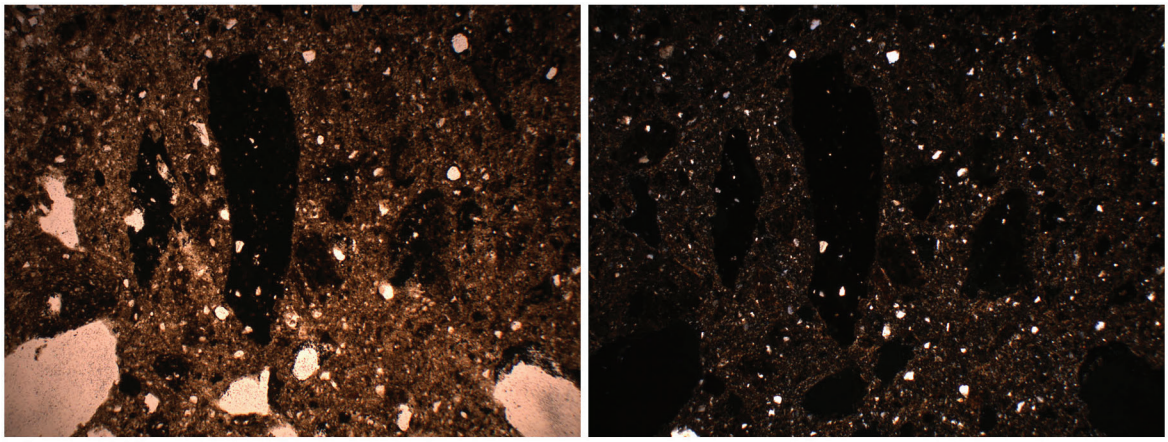

Figure 13b.

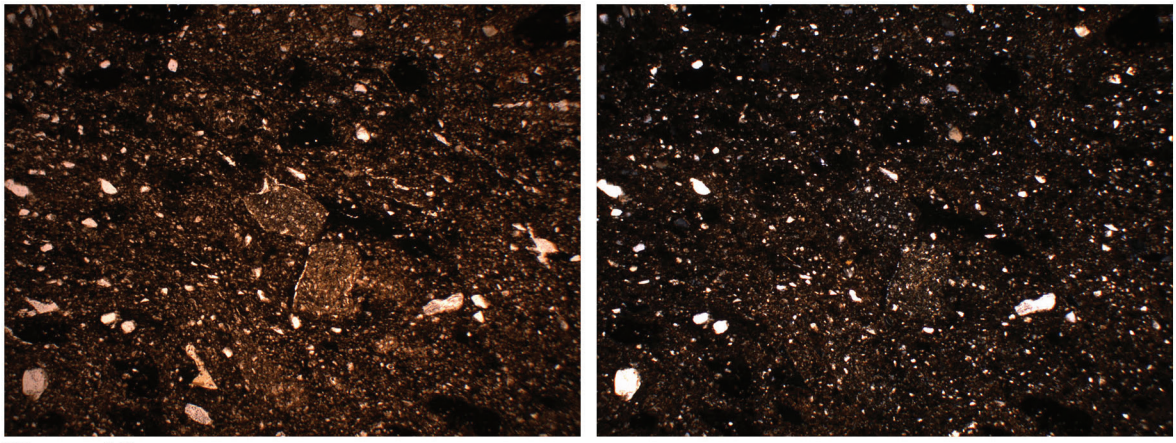

Figure 13c.

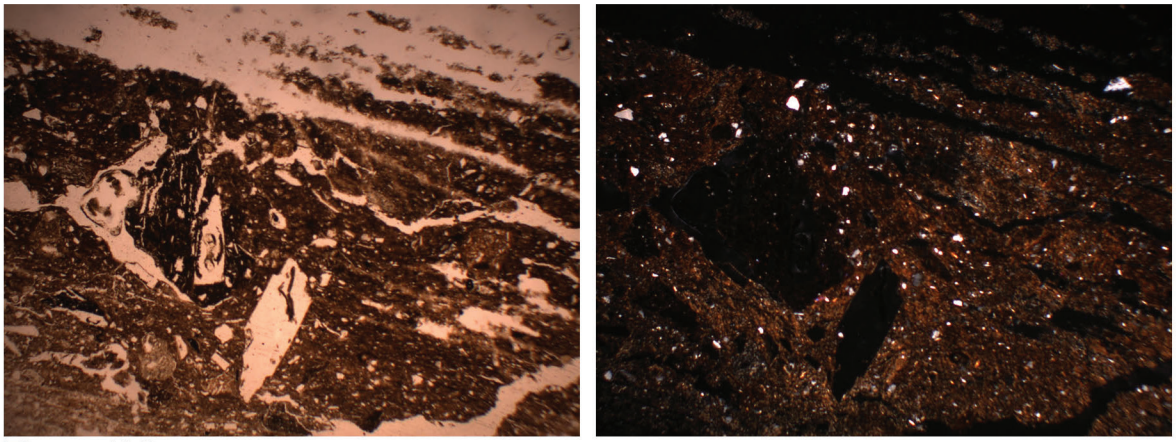

Figure 13d.

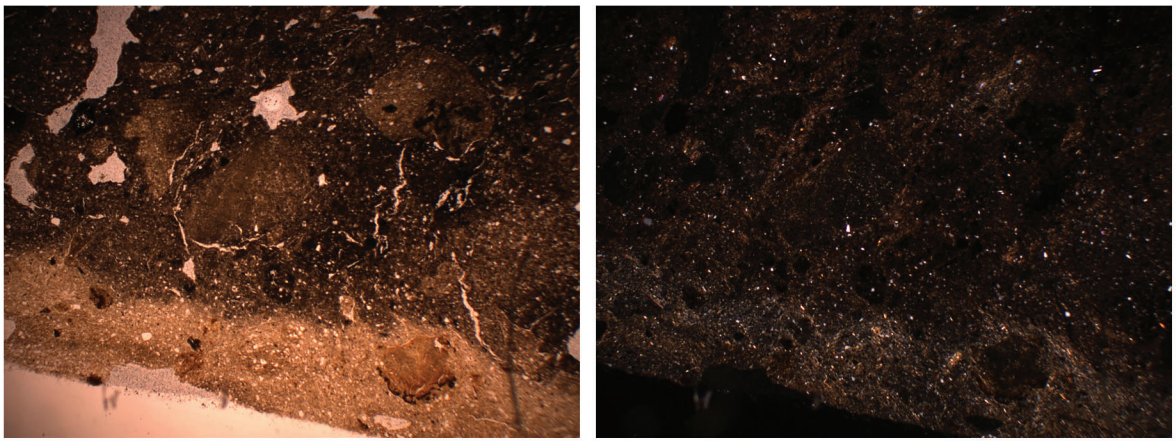

Figure 13e.

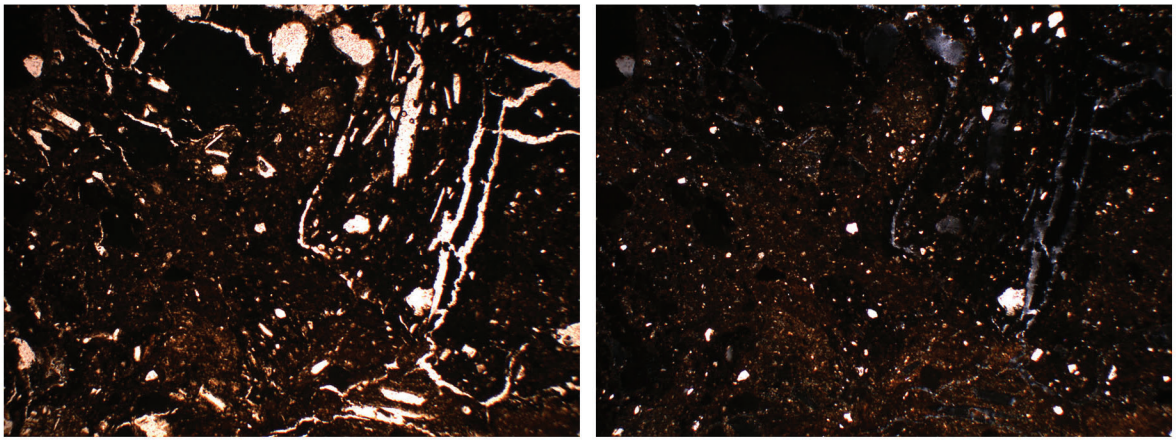

Figure 13f.

Figure 13. Photographs of grog-tempered thin sections: a, No. 3; b, No. 5; c, No. 15; d, No. 21; e, No. 23; f, No. 27. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Sherd No. 5 (Figure 13b)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 2.5Y 7/6, yellow
B-fabric (XPL): Speckled/Slightly Active
Edge Description: N/A
Grog Description: Generally tempered with sand or bone (bone is not platy).
Comments: Missing inclusions might be sand or grog. Bone is not common in the thin section. Muscovite is present.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	79.4%	Paste	200	88.1%
Bone	1	0.4%	Sand	15	6.6%
Grog	10	4.0%	Bone	1	0.4%
Quartz	13	5.2%	Grog	10	4.4%
Alkali feldspar	1	0.4%	Mica	1	0.4%
Muscovite	1	0.4%	**Total**	**227**	
Chert	1	0.4%			
Voids	25	9.9%			
Total	**252**				

Also present: hematite (common), polycrystalline quartz (common)
Percentage of voids that might be missing inclusions: 60%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .12	.05	.04	.04
Grog	.48 – 1.52	.91	.85	.56
All Inclusions	.02 – 1.52	.37	.06	.68

Sherd No. 15 (Figure 13c)

Paste Matrix (PPL): Mottled
Paste Color (PPL): 2.5Y 6/6, olive yellow with spots of 2.5Y 3/3, dark olive brown
B-fabric (XPL): Speckled/Slightly Active (very slight)
Edge Description: On one side there are some dark red spots (approximately 0.06 mm thick) along the edge (possible artifact of thin section production).
Grog Description: Generally sand-tempered. The paste is the same as the paste in the thin section.
Comments: Clay pellets are discrete dark reddish-brown to black inclusions with little sand: possible hematite or grog. Muscovite is present.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	82.0%	Paste	200	84.0%
Sherd	8	3.3%	Sand	26	10.9%
Quartz	23	9.4%	Grog	8	3.4%
Polycrystalline quartz	2	0.8%	Mica	1	0.4%
Alkali feldspar	1	0.4%	Other	3	1.3%
Muscovite	1	0.4%	**Total**	**238**	
Clay pellet	3	1.2%			
Voids	6	2.5%			
Total	**244**				

Also present: plagioclase (rare)

Percentage of voids that might be missing inclusions: 0%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .22	.06	.04	.05
Grog	.22 – .80	.52	.50	.30
All Inclusions	.02 – 1.04	.20	.06	.35

Sherd No. 21 (Figure 13d)

Paste Matrix (PPL): Mottled

Paste Color (PPL): 10YR 5/6, yellowish-brown with spots of 10YR 3/4, dark yellowish-brown

B-fabric (XPL): Speckled/Slightly Active

Edge Description: N/A

Grog Description: Generally tempered with bone or shell – most of the inclusions are missing (represented by platy voids)

Comments: The bulk of the thin section is too thin or missing. When point counting, skipped large breaks in the thin section. Several of the voids are platy-shaped – possibly bone. Tiny muscovite is present.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	82.0%	Paste	200	89.3%
Sherd	11	4.5%	Sand	12	5.4%
Quartz	12	4.9%	Grog	11	4.9%
Muscovite	1	0.4%	Mica	1	0.4%
Voids	20	8.2%	Total	224	
Total	244				

Also present: hematite (uncommon), microcline (rare)

Percentage of voids that are possibly missing inclusions: 40%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .06	.04	.04	.04
Grog	.08 – 1.66	.84	.92	.96
All Inclusions	.02 – 1.66	.40	.06	.81

Sherd No. 23 (Figure 13e)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 2.5Y 6/4, light yellowish-brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: One edge is lighter (2.5Y 8/4, pale yellow) and more active, but also rubbed a little thin.
Grog Description: Generally tempered with sand or grog. Several have the same paste as the thin section.
Comments: Opaque possibly burnt (black) bone (rare). Small muscovite pieces very common.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	78.7%	Paste	200	85.1%
Grog	18	7.1%	Sand	14	6.0%
Quartz	14	5.5%	Grog	18	7.7%
Muscovite	1	0.4%	Mica	2	0.9%
Opaque	1	0.4%	Other	1	0.4%
Biotite	1	0.4%	**Total**	**235**	
Voids	19	7.48%			
Total	**254**				

Also present: mica schist (rare), alkali feldspar (rare)
Percentage of voids that might be missing inclusions: 10.5%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .60	.07	.02	.02
Grog	.18 – .78	.49	.50	.26
All Inclusions	.02 – .78	.29	.24	.50

Sherd No. 27 (Figure 13f)

Paste Matrix (PPL): Mottled with core
Paste Color (PPL): 10YR 5/8, yellowish-brown with spots of 10YR 3/3, dark brown (mostly around voids) – core: 10YR 4/4, dark yellowish brown
B-fabric (XPL): Speckled/Slightly Active – Core is undifferentiated
Edge Description: Spots of dark red to black run along one edge
Grog Description: Generally tempered with bone or shell (mostly platy voids are seen in crushed sherds)
Comments: Some platy voids running parallel to the rim may be bone.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	82.3%	Paste	200	88.1%
Grog	13	5.3%	Sand	14	6.2%
Quartz	12	4.9%	Grog	13	5.7%
Polycrystalline quartz	1	0.4%	**Total**	**227**	
Alkali feldspar	1	0.4%			
Voids	16	6.6%			
Total	**243**				

Also present: muscovite (uncommon), hematite (common), clay pellet (uncommon), bone (rare)
Percentage of voids that might be missing inclusions: 50%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – 1.12	.16	.04	.11
Grog	.40 – 1.20	.74	.70	.48
All Inclusions	.02 – 1.20	.44	.42	.72

Grog and Sand Temper

The grog and sand temper category was distinguished from the grog temper category by the quantity and size of sand in the thin section. Only one thin section from the Spiro site was represented in this group: No. 24. Thin section No. 24 had 14.2% sand and 16.6% grog, which is a higher percentage in either inclusion category than any of the thin sections in the grog temper category (see Table 4). In addition, the majority of the sand inclusions were in the fine sand size category (0.126 to 0.25 mm) (Figure 14). The larger sand particles may suggest that the some of the sand was intentionally added as temper to the clay.

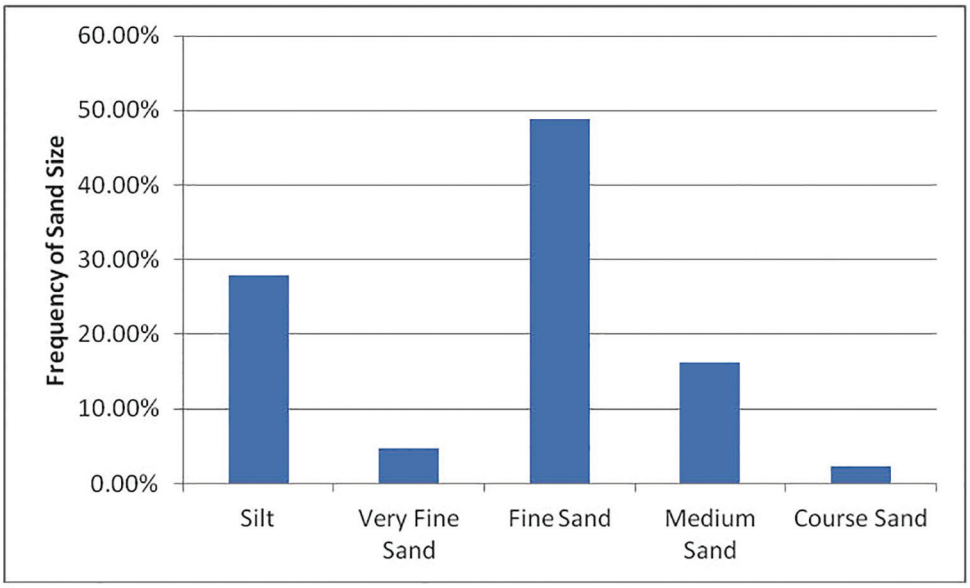

Figure 14. Distribution of sand size based on the Wentworth scale for thin section No. 24.

Sherd No. 24 (Figure 15)

Paste Matrix (PPL): Continuous (Core)
Paste Color (PPL): 10YR 5/6, yellowish-brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: Edges are more active in XPL than core
Grog Description: Generally tempered with sand or grog
Comments: Lots of hematite present. Opaques are most likely hematite.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	62.5%	Paste	200	66.2%
Grog	50	15.6%	Sand	43	14.2%
Quartz	33	10.3%	Grog	50	16.6%
Polycrystalline quartz	4	1.3%	Other	9	3.0%
Alkali feldspar	6	1.9%	**Total**	**302**	
Clay pellet	1	0.3%			
Opaque	8	2.5%			
Voids	18	5.6%			
Total	**320**				

Also present: bone (rare)

Percentage of voids that might be missing inclusions: 0%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .58	.17	.18	.20
Grog	.10 – 1.64	.45	.39	.27
All Inclusions	.02 – 1.64	.31	.26	.27

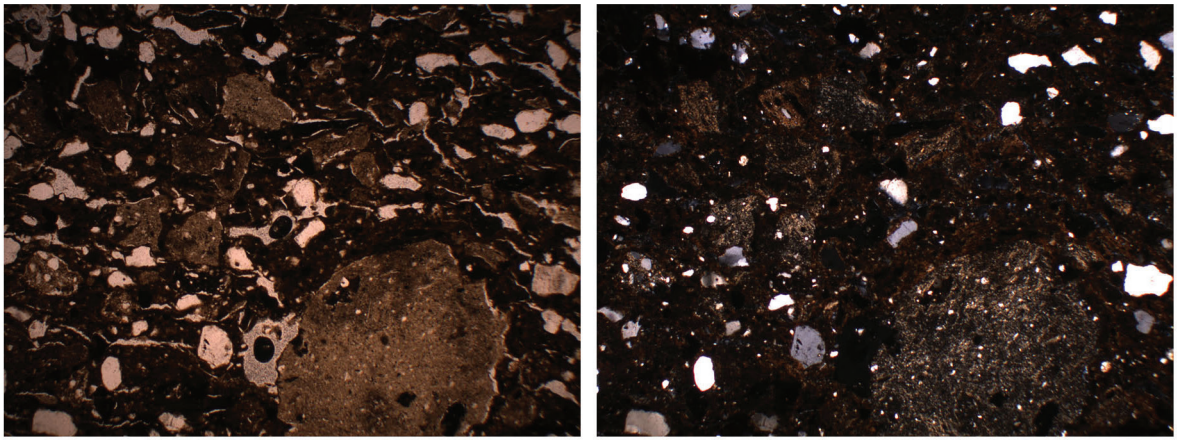

Figure 15.

Figure 15. Photographs of grog-sand tempered thin section No. 24. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Shell Temper

The shell temper category was based on the presence of shell without bone or grog. The shell temper category represented 17.4% of the thin sections, including three sherds from the Spiro site (No. 10, No. 18, and No. 20) and one sherd from the Moore #3 site (No. 29, see description below). The percentage of shell in this temper category ranged from 10.9% to 35.8%. A box plot of the shell size distribution by sherd No. is shown in Figure 16. With the exception of thin section No. 10, the shell is commonly platy-shaped (Figure 17). Given the difference in percentage, size, and shape of the shell, thin section No. 10 may likely represent a vessel made with different manufacturing processes than the other thin sections in this category. Experimental production of shell temper using burnt mussel shell typically yields easily separable shell platelets which are similar to those noted in the majority of the thin sections. It is possible that a different temper preparation technique may have been used in the case of the shell noted in thin section No. 10.

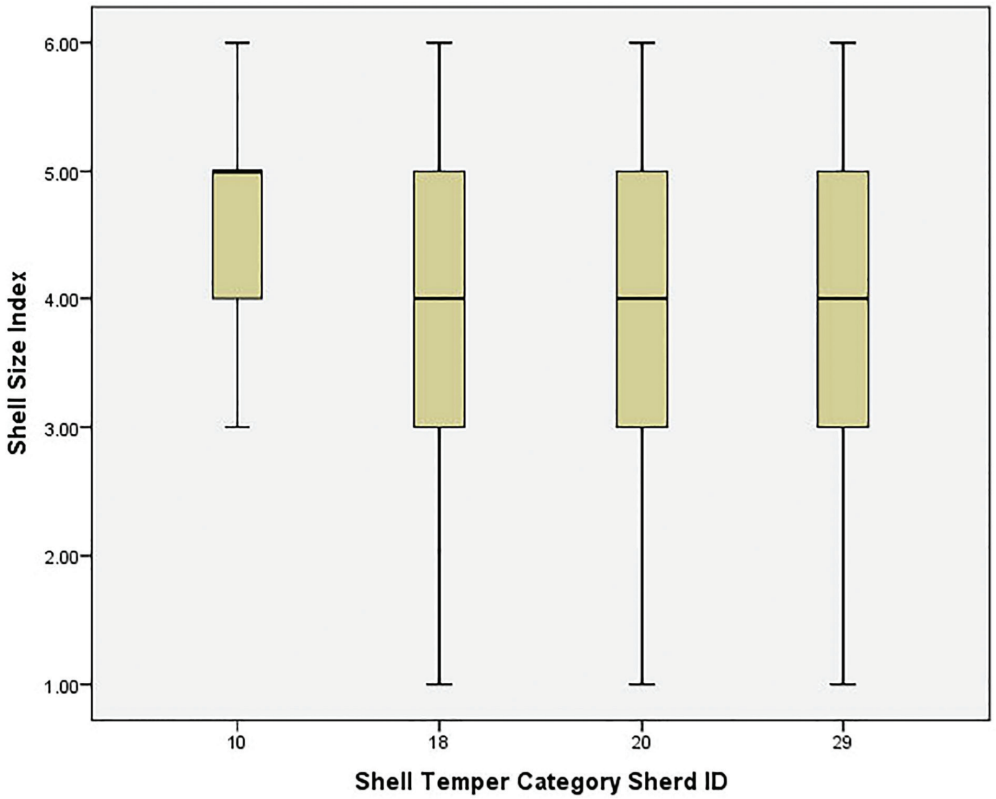

Figure 16. Box plot showing the distribution of shell size for shell-tempered sherds.

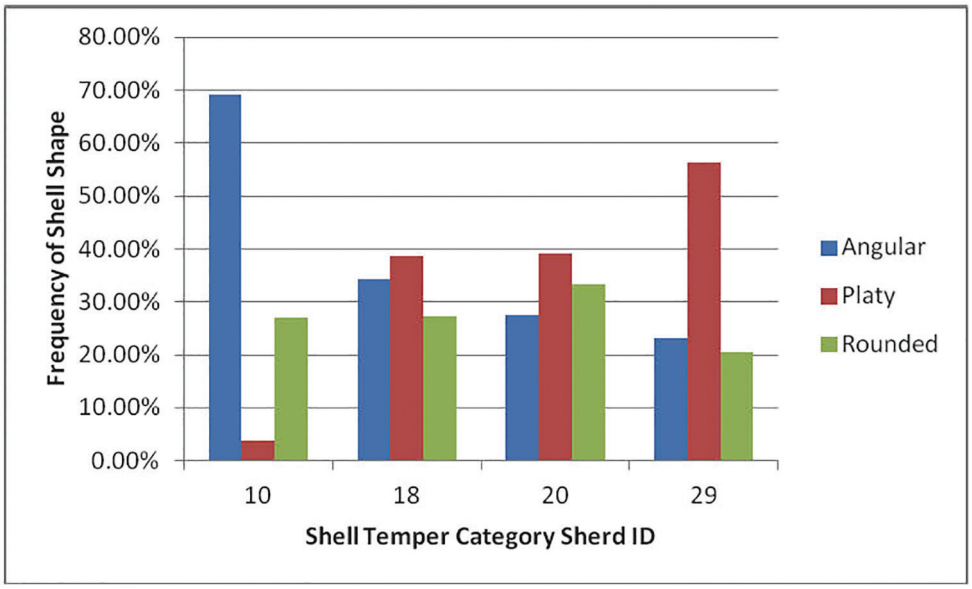

Figure 17. Distribution of shell shape by sherd No.

The percentage of sand in this category ranged from 2.9% to 4.6%. Figure 18 shows the sand size distribution based on the Wentworth scale. Thin section No. 29 from Moore #3 (see below) stands out from the other thin sections in this category in that all the sand is silt size. The other thin sections in this category have more variable sand size particles suggesting that they represent vessels made of a variety of distinct clays or they represent a range of manufacture traditions within these shell-tempered vessels.

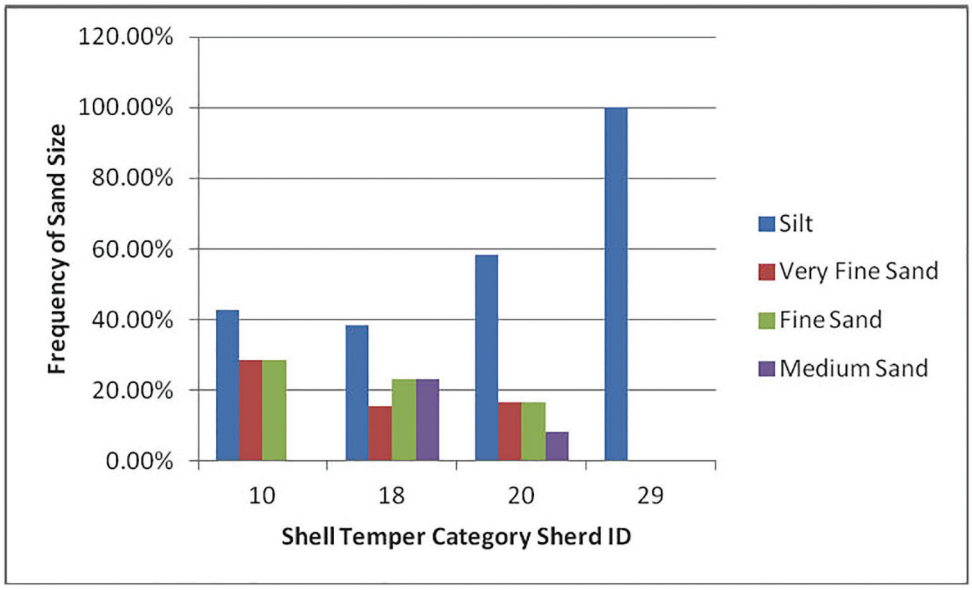

Figure 18. Distribution of the sand size category for shell-tempered sherds based on the Wentworth scale by sherd No.

Sherd No. 10 (Figure 19a)

Paste Matrix (PPL): Mottled

Paste Color (PPL): 10YR 4/6, dark yellowish-brown with spots of 2.5Y 7/8, yellow

B-fabric (XPL): Speckled/Slightly Active

Edge Description: N/A

Comments: Calcium carbonate may also be shell. Most shell is not platy-shaped. No apparent orientation for inclusions.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	82.0%	Paste	200	83.7%
Shell	26	10.7%	Sand	7	2.9%
Quartz	7	2.9%	Shell	26	10.9%
Calcium carbonate	5	2.0%	Other	6	2.5%
Hematite	1	0.4%	**Total**	**239**	
Voids	5	2.0%			
Total	**244**				

Also present: muscovite (common), alkali feldspar (common), polycrystalline quartz (common)

Percentage of voids that might be missing inclusions: 40%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .14	.08	.10	.12
Shell	.18 – 1.90	.71	.58	.51
All Inclusions	.02 – 1.90	.53	.44	.50

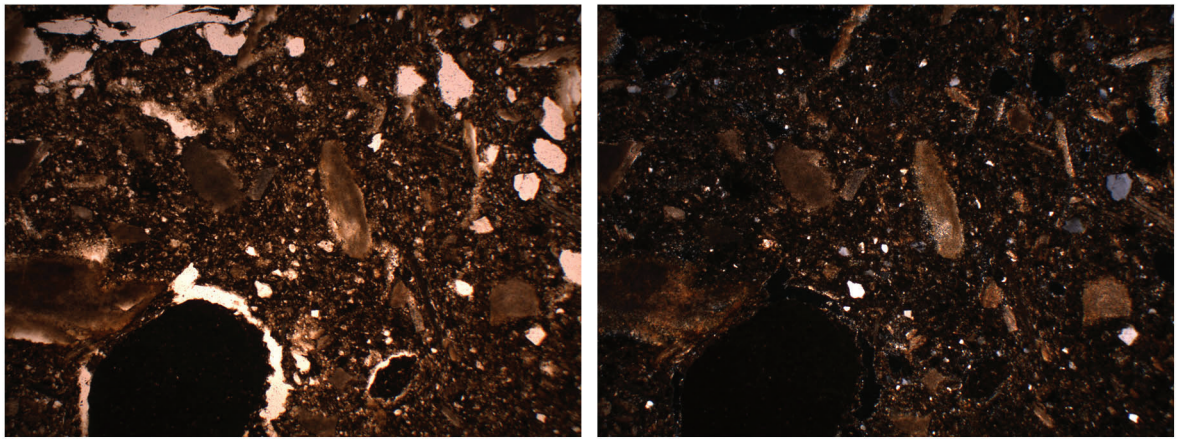

Figure 19a.

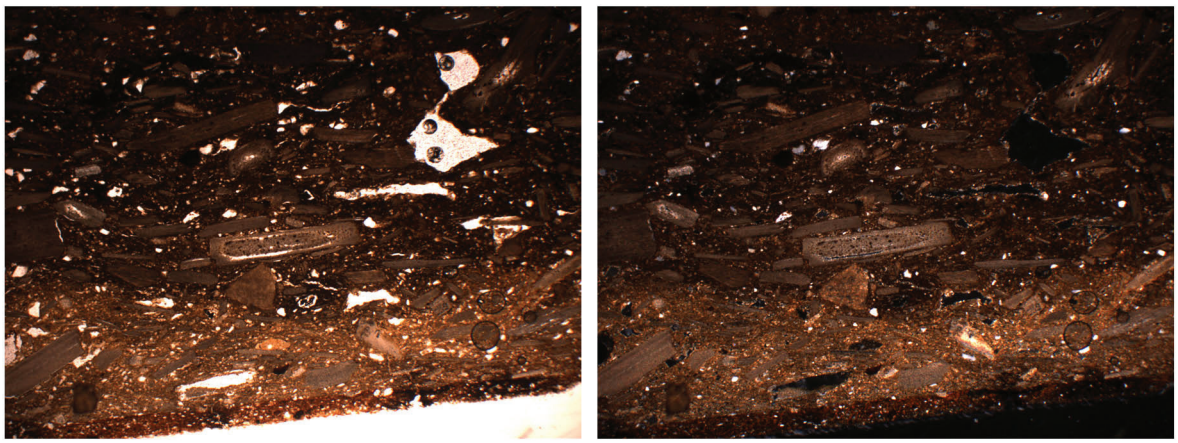

Figure 19b.

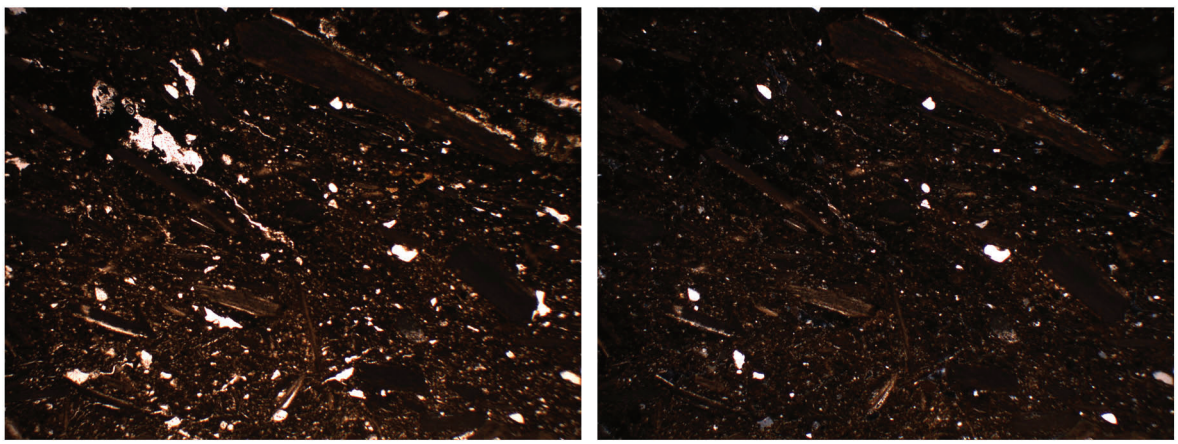

Figure 19c.

Figure 19. Photographs of shell-tempered thin sections: a, No. 10; b, No. 18; c, No. 20. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Sherd No. 18 (Figure 19b)

Paste Matrix (PPL): Zoned

Paste Color (PPL): outside edge: 7.5YR 5/8, strong brown; second layer: 10YR 7/6, yellow; core: 10YR 4/6, dark yellowish-brown

B-fabric (XPL): Outside edge: Specked/Active; second layer: Speckled/Slightly Active; core: mostly Undifferentiated

Edge Description: Possible slip present (shell is not present in outside edge), although spots missing. The edge is mostly missing.

Comments: Most of the shell is platy-shaped and oriented parallel to the rim. The shell in half of the thin section is all dissolved (voids only)

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	63.4%	Paste	200	70.7%
Shell	70	22.2%	Sand	13	4.6%
Quartz	9	2.9%	Shell	70	24.7%
Polycrystalline quartz	2	0.6%	**Total**	**283**	
Alkali feldspar	1	0.3%			
Microcline	1	0.3%			
Voids	32	10.2%			
Total	**315**				

Also present: plagioclase (common), biotite (rare)

Percentage of voids that might be missing inclusions: 59.4%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .36	.14	.10	.18
Shell	.04 – 1.64	.44	.29	.47
All Inclusions	.02 – 1.64	.39	.26	.42

Sherd No. 20 (Figure 19c)

Paste Matrix (PPL): Continuous

Paste Color (PPL): 10YR 5/6, yellowish-brown

B-fabric (XPL): Speckled/Slightly Active

Edge Description: Same as the rest of the paste

Comments: About half of the shell in the thin section has a cloudy appearance. Shell generally has a platy shape and is oriented parallel to the rim. Organic is likely a plant twig/charcoal.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	73.8%	Paste	200	75.8%
Shell	51	18.8%	Sand	12	4.6%
Quartz	12	4.4%	Shell	51	19.3%
Organic	1	0.4%	Other	1	0.4%
Voids	7	2.6%	**Total**	**264**	
Total	**271**				

Also present: muscovite (common), plagioclase (uncommon), alkali feldspar (uncommon), microcline (rare)

Percentage of voids that might be missing inclusions: 14.3%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .32	.10	.05	.11
Shell	.06 – 2.0	.46	.36	.48
All Inclusions	.02 – 2.0	.39	.28	.41

Shell and Grog Temper

This temper category was distinguished from the shell temper category by the presence of grog in addition to the shell. Only one thin section (No. 22) from the Spiro site was represented in this category. Thin section No. 22 had 3.7% sand, 10% grog, and 3.3% shell. The majority of the sand (89%) was silt size. Platy shell was common (36%). The crushed sherds used as temper, were themselves tempered with shell/bone.

Sherd No. 22 (Figure 20)

Paste Matrix (PPL): Mottled
Paste Color (PPL): 2.5Y 5/6, light olive brown with streaks of 2.5Y 3/3, dark olive brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: One edge is lighter (2.5Y 7/6, yellow) and more active
Grog Description: Generally tempered with shell and some possibly bone. Some of the inclusions are platy in the crushed sherds.
Comments: Shell is generally platy-shaped and oriented parallel to the rim

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	79.1%	Paste	200	83.0%
Grog	24	9.5%	Sand	9	3.7%
Shell	8	3.2%	Shell	8	3.3%
Quartz	8	3.2%	Grog	24	10.0%
Polycrystalline quartz	1	0.4%	**Total**	**241**	
Voids	12	4.7%			
Total	**253**				

Also present: hematite (common), bone (uncommon), muscovite (uncommon), plagioclase (rare)
Percentage of voids that might be missing inclusions: 8.3%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – 1.46	.19	.04	.02
Shell	.14 – .84	.32	.27	.22
Grog	.22 – 1.40	.71	.64	.66
All Inclusions	.02 – 1.46	.52	.38	.69

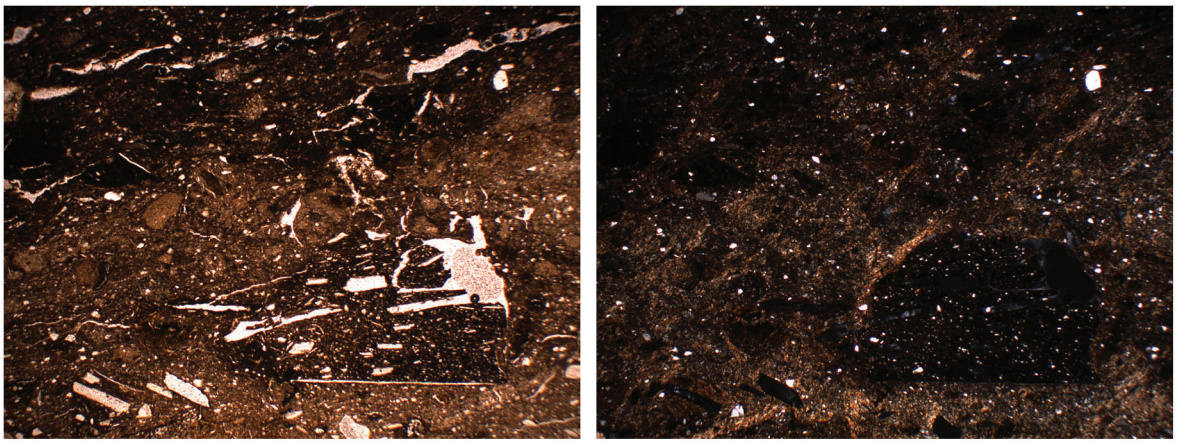

Figure 20.

Figure 20. Photographs of shell-grog tempered thin section No. 22. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Shell, Bone, and Grog Temper

This temper category was distinguished by the presence of shell, bone, and grog in the thin section. Only one thin section from the Spiro site (No. 16) was represented in this group. Thin section No. 16 had 11.2% sand, 2.5% bone, 5.8% grog, and 6.9% shell. The sand particles were commonly (48%) silt sized. The bone inclusions were angular, but the shell inclusions were generally platy in shape (Figure 21). The difference is consistent with the likelihood that bone and shell underwent different processing techniques to transform them into temper. The crushed sherds were generally tempered with sand, shell, shell and bone, or bone.

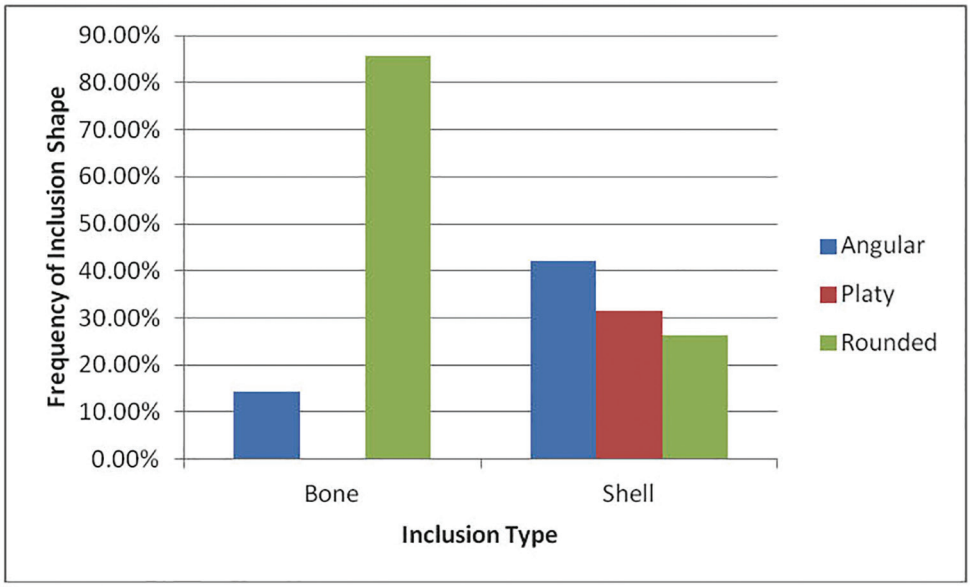

Figure 21. Distribution of bone and shell inclusion shapes for thin section No. 16 from the Spiro site.

Sherd No. 16 (Figure 22)

Paste Matrix (PPL): Continuous
Paste Color (PPL): 2.5Y 5/6, light olive brown
B-fabric (XPL): Speckled/Slightly Active
Edge Description: Both edges are rubbed too thin
Grog Description: Generally tempered with sand, shell, shell and bone, or bone. Shell is generally platy-shaped.
Comments: Calcite maybe shell or completely replaced bone. Some of the shell temper has a platy shape but not the bone.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	68.7%	Paste	200	72.5%
Bone	7	2.4%	Sand	31	11.2%
Grog	16	5.5%	Bone	7	2.5%
Shell	19	6.5%	Shell	19	6.9%
Quartz	26	8.9%	Grog	16	5.8%
Polycrystalline quartz	3	1.0%	Other	3	1.1%
Alkali feldspar	1	0.3%	**Total**	**276**	
Calcite	3	1.0%			
Microcline	1	0.3%			
Voids	15	5.2%			
Total	**291**				

Also present: muscovite (common), plagioclase (common), charcoal (rare), hornblende (rare)
Percentage of voids that might be missing inclusions: 21.4%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .20	.08	.08	.08
Bone	.06 – .36	.19	.12	.24
Shell	.06 – 1.22	.37	.28	.42
Grog	.18 – 1.22	.51	.40	.48
All Inclusions	.02 – 1.22	.26	.16	.28

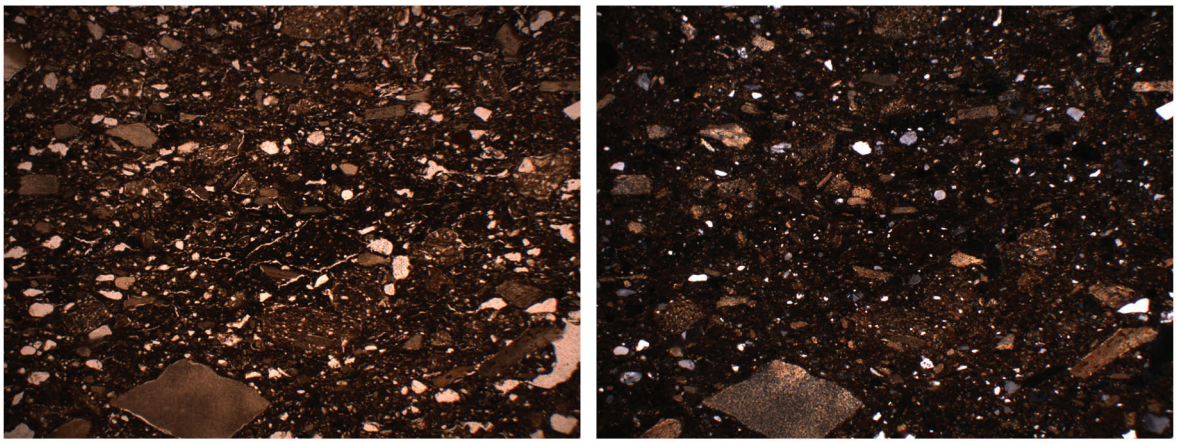

Figure 22.

Figure 22. Photographs of shell-bone-grog tempered thin section No. 16. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Sherd from the Moore #3/Ainsworth site

The one sherd (thin section No. 29) from the Moore #3 site is shell-tempered. Other paste details include (Figure 23):

Paste Matrix (PPL): Continuous
Paste Color (PPL): 7.5YR 4/6, strong brown
B-fabric: Undifferentiated
Edge Description: Edges are slightly lighter in PPL (7.5YR 5/6, strong brown) and slightly active in XPL
Comments: Most of the shell is platy-shaped and oriented parallel to the rim.

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	57.8%	Paste	200	61.2%
Shell	117	33.8%	Sand	10	3.1%
Quartz	10	2.9%	Shell	117	35.8%
Voids	19	5.5%	**Total**	**327**	
Total	**346**				

Also present: muscovite (common), alkali feldspar (rare)
Percentage of voids that might be missing inclusions: 0%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.02 – .06	.04	.04	.04
Shell	.06 – 1.96	.55	.42	.59
All Inclusions	.02 – 1.96	.51	.40	.60

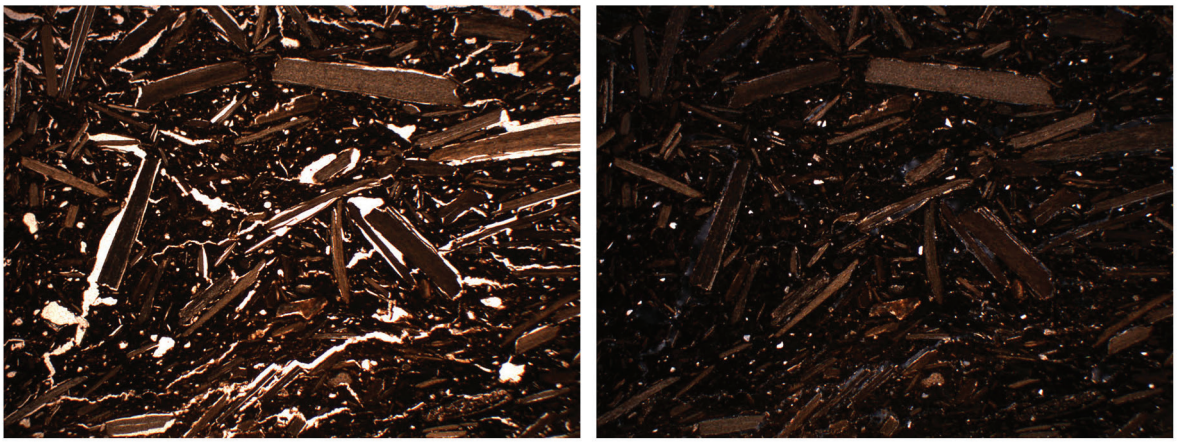

Figure 23.

Figure 23. Photographs of shell-tempered thin section No. 29 from the Moore #3 site. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Sherd from the Geren site

The sherd/thin-section from the Geren site is the most distinctive in the analyzed sample because of the presence in the paste of biotite and mica schist as temper. Thin section No. 28 from Geren had 13.2% sand and 14.6% mica. Given the variability in the sand size (Figures 24 and 25), it is possible that sand was added as temper to a very micaceous clay:

Paste Matrix (PPL): Half & Half (possibly due to one side of the thin section is ground too thin)
Paste Color (PPL): 10YR 5/6, yellowish-brown and 10YR 7/6, yellow
B-fabric (XPL): Striated/Active
Edge description: Edges same as the rest of the paste.
Grog description: N/A
Comments: In PPL most of the paste is pleochroic due to the amount of biotite. Unknown might be burnt shell or clay pellet

Point Count

Paste/Inclusion	Count	Percent	Simplified Inclusion Category	Count	Percent
Paste	200	66.7%	Paste	200	71.4%
Quartz	13	4.3%	Sand	37	13.2%
Polycrystalline quartz	20	6.7%	Mica	41	14.6%
Alkali feldspar	4	1.3%	Other	2	0.7%
Muscovite	1	0.3%	**Total**	**280**	
Hematite	1	0.3%			
Biotite	20	6.7%			
Mica Schist	20	6.7%			
Unknown	1	0.3%			
Voids	20	6.7%			
Total	**300**				

Also present: plagioclase (rare)
Percentage of voids that might be missing inclusions: 0%

Inclusion Size (mm)

	Range	Mean	Median	Interquartile Range
Sand	.04 – 1.22	.31	.22	.37
Mica	.02 – 1.34	.31	.20	.32
All Inclusions	.02 – 1.34	.32	.21	.34

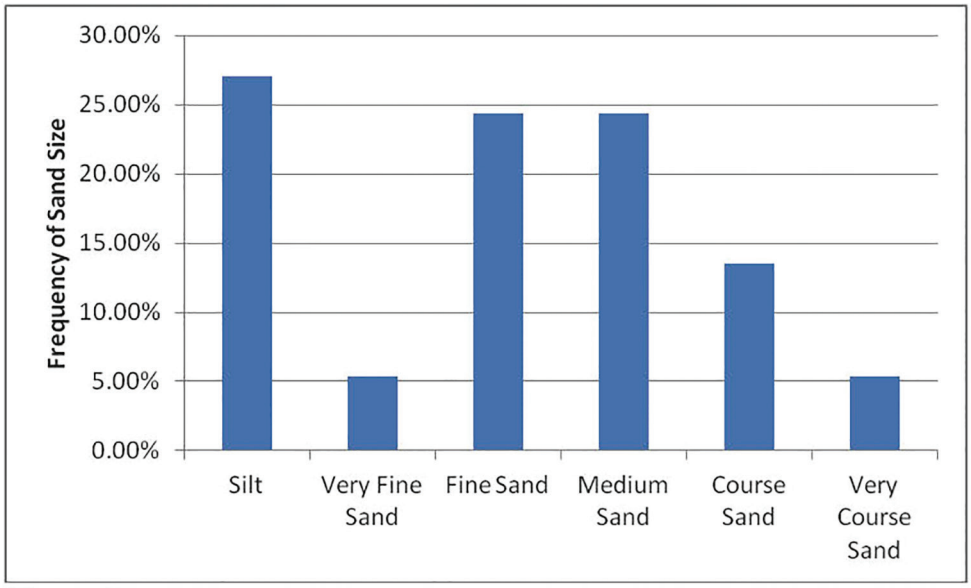

Figure 24. Size distribution for sand in thin section No. 28 from the Geren site.

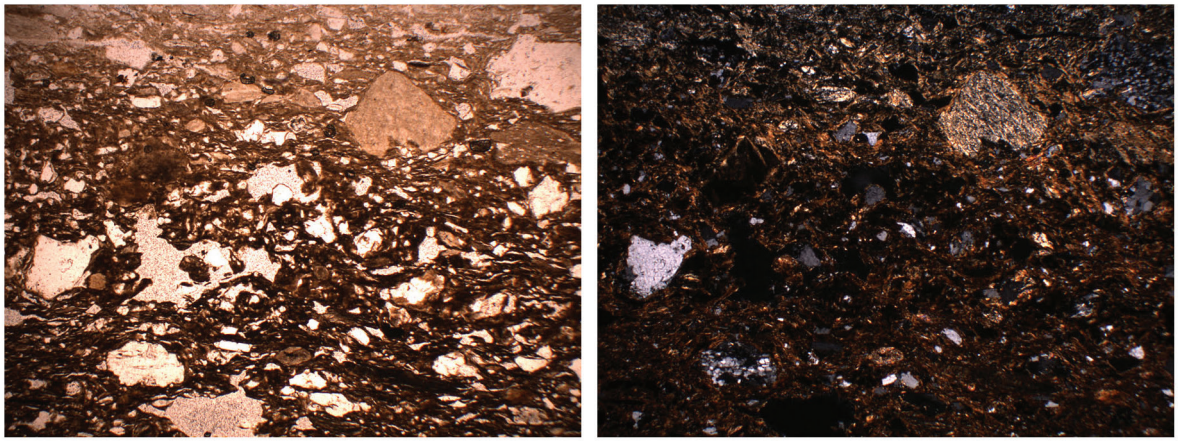

Figure 25.

Figure 25. Photographs of micaceous-tempered thin section No. 29 from the Geren site. All photographs are at 4x magnification. The plane light image is on the right and the cross-polar light image is on the left.

Summary and Conclusions

The petrographic analysis of the 23 thin sections of ceramic vessel sherds from the Spiro, Moore #3, and Geren sites in the Arkansas River basin in eastern Oklahoma has identified eight temper categories based on the percentage of inclusions recorded during point counting. It is unclear whether the temper variation is due to differences in production locale, temporal variation, or ware type (fine ware vs. utility ware), but more than likely the variation is due to all three factors. It has been established that shell-tempered ceramics in the Arkansas River basin in eastern Oklahoma generally replace grog and/or-bone-tempered ceramics after ca. A.D. 1250, although Brown (1996:157) notes the "coexistence of locally made shell tempered pottery and grog and grog-grit-bone pottery" at the Harlan site, another important mound center in the Arkansas River basin, during the Harlan phase (ca. A.D. 1050-1250). Furthermore, he notes that grogs "composed of crushed shell tempered pottery is…very distinctive of the Harlan phase at Spiro."

With the exception of the micaceous sand temper category, the other temper categories consist of some variation of bone, shell, and/or grog. The sherds from the Spiro site with grog, bone-grog, and bone temper are from Williams Plain, Sanders Plain, Spiro Engraved, Redland Engraved, Agee Incised, and LeFlore Plain vessels (see Tables 2 and 4). The few from established contexts date from ca. A.D. 1000-1450.

Two shell-grog and shell-bone-grog sherds (thin sections No. 16 and No. 22) were classified as Sanders Plain, a grog-tempered slipped type, by Brown (1996) (see Table 2); the temper apparent in the grog is bone/shell. Brown (1996:401) does note that Sanders Plain vessels do have "grog temper in which finely divided shell is included in the grog."

Two of the sherds (No. 19 and 26) had been classified as Poteau Plain, a slipped shell-tempered ware (Brown 1996:405), by Brown (see Table 2), but they have bone temper (see Table 4). These sherds, both of which are red-slipped, are better included in the Sanders Plain group in this assemblage. Another sherd identified through petrographic analysis as having bone temper—thin section No. 14—was classified by Brown as Bell Plain (see Table 2); this sherd was found in a Norman phase context (see Table 1). Since Bell Plain is an undecorated fine-shell ware (Brown 1996:392), sherd thin section No. 14 should be reclassified as coming from a plain bone-tempered vessel of uncertain type.

The shell-tempered sherds represented in the analyzed thin sections include Woodward Plain, from the Moore #3 site, and three sherds of red-slipped Poteau Plain (No. 10, No. 18, and No. 20) (see Table 2). They are from post-A.D. 1250 contexts at the Spiro and Moore #3 sites.

The micaceous sand-tempered neck banded sherd from the Geren site definitely stands out from all the other thin sections and may represent a fragment from an exotic or non-local ceramic vessel. However, it should also be noted that thin section No. 23 (grog-tempered), from a LeFlore Plain vessel, had a small mica schist fragment and biotite was also recorded. It is possible, therefore, that these mica fragments came from the addition of crushed micaceous sand-tempered sherds; this suggests that the micaceous sand-tempered pottery may possibly have been made in a locale not that far removed from the Spiro mound area, although that seems unlikely. Instead, we consider this sherd to have come from a non-shell-tempered Nash Neck Banded vessel made by a Caddo potter in the Red River basin after ca. A.D. 1300, among either a McCurtain phase Caddo group living in the Glover River or Mountain Fork drainages in southeastern Oklahoma (see Dowd 2012; Regnier 2013:48-51) or a Texarkana phase Caddo group on the Red River itself (see Perttula and Nelson 2003).

While we do believe that a discussion of the human behavior implicated by these petrographic differences and similarities among the sherds from the Spiro site and other eastern Oklahoma Arkansas River basin sites is what we all strive to accomplish and get to, the small size of the present sample limits such broad generalizations. For example, while differences in temper processing, such as platy versus unplaty bone inclusion, may relate to social learning or different communities of practice, however, this sample of thin sections is too diverse (temporally and by ceramic types) and lacks sufficient context to be able to discuss how they relate to human behavior. The goal of this petrographic analysis project was to provide a general characterization of the paste and temper to help guide future research on the ceramics from the region. As sample sizes increase and are more solidly provenienced, such broader conclusions would be warranted. The same thing can be said about the behavioral implications of the minor inclusions in the sherd pastes. More samples would be needed to discern the importance of the minor inclusions in considering the character of the pastes and in distinguishing sand sources.

The four most common temper categories (bone, bone and grog, grog, and shell) in the analyzed sherd thin sections were not homogeneous categories and there was considerable paste variation within each category. With a larger sample size of sherd thin sections from other Spiro area ceramic assemblages, it may be possible to further break down these temper categories into more homogeneous groups with regionally-specific temporal and/or technological characteristics. Of particular interest was the variation in bone and/or shell temper shape and the type of crushed sherds (i.e., grog) used as temper. Future petrographic research should focus on these variations as they relate to ceramic vessel manufacturing/technological processes, which in turn may provide insights into the existence of different ceramic traditions made by spatially and temporally distinct northern Caddo groups within the region.

Acknowledgments

We wish to thank Dr. James A. Brown for encouraging this belated study of the petrographic thin-sections from the Spiro, Geren, and Moore sites in eastern Oklahoma. Of course, we are particularly grateful that he sent the thin sections for study in the first place, and we are glad that we have finally been able to see the petrographic analysis completed. Thanks also to Dr. Reid Ferring for passing the thin-sections and sherds along to Perttula, and to Dr. Scott W. Hammerstedt, Dr. George Avery, and two anonymous peer reviewers for providing comments on the manuscript. Dr. Elsbeth Dowd provided Sam Noble Oklahoma Museum of Natural History provenience information for the sherds and thin sections.

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An Aggregate of Spear Points from Atoka County, Oklahoma

Robert L. Brooks

Abstract

Nine spear points were reported from a farm in northwestern Atoka County, Oklahoma. This aggregate of points appeared to bean isolate as no other prehistoric material was found in the vicinity. The following study discusses the setting and nature of the specimens, stylistic attributes of the spear points and their age, technological and functional characteristics of the pieces, and whether these items represent caching behavior.

Introduction

In the fall of 2013, a family from northern Atoka County reported a cluster of spear points found near their home (Figure 1). A subsequent photograph provided by the family revealed that these were large, basally-notched spear points. On October 27th 2013, I visited the family and examined the location where the materials were collected. They were very gracious in permitting me to photograph and analyze the specimens.

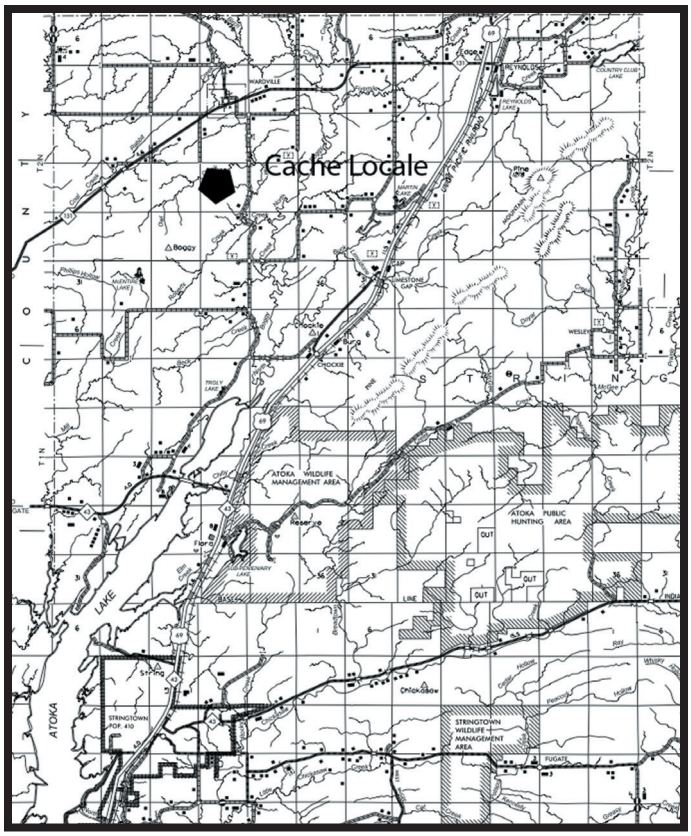

Figure 1. The location of the spear point aggregate in Atoka County.

Setting

The location where the spear points were found is situated in the saddle of a north-south trending ridge (Figure 2). The setting presents a good vista of the surrounding landscape, especially to the west. It is also quite distant from water with an intermittent stream some 400 meters southeast. Dissected uplands and shallow stream valleys characterize the topography of northern Atoka County. It forms part of the McAlester Marginal Hills Belt that is comprised of Pennsylvanian-age sandstone and shales (Johnson 2006). Natural vegetation in the region is a Post Oak-Blackjack regime commonly referred to as the "Cross Timbers" (Hoagland 2006a). The Cross Timbers represent a mosaic of scrub forest areas interspersed by grasslands. However, here the native vegetation has been replaced by improved pasturelands. Accompanying soils are Mollisols that form under principally grassland conditions (Hoagland 2006b).

Figure 2. Setting of the artifacts in saddle area of ridge.

Spear Point Cluster Context

The cluster of spear points occur where cattle had been congregating around a salt block and churning the soil in an area roughly two meters in diameter (Figure 3). Upon seeing the artifacts in the churned-up area, family members worked through the loose soil finding six complete and three broken points. They were fairly thorough, recovering many of the fragments from the broken pieces. Family members describe the points as being present on the surface and only requiring removal of a few inches of soil to expose them. I reexamined the salt block locale and saw no evidence of additional points, point fragments, or other chipped stone debris. However, the exposed area was not excavated to attempt recovery of the small missing fragments. The surrounding areas of the ridge were also examined, but this canvassing failed to reveal any evidence of prehistoric material. It would appear that the cluster of spear points represents an isolated event and not part of larger prehistoric use area.

Figure 3. Area of salt lick and cattle disturbance.

The Spear Points

The nine spear points are relatively uniform in respect to their flaking characteristics as well as tool stone source material (Figure 4). All appear to have been manufactured from relatively large flake blanks. The bifacial blades exhibit moderately broad to broad, somewhat shallow, flake scars suggestive of soft hammer percussion. Lateral edges have been pressure-retouched indicating that these are finished pieces. However, the spatulate termination of Specimen Number 1 (Figure 5a) suggests that either it was not intended for use as a projectile or that it was waiting for reworking to a more pointed distal termination. All of the specimens exhibit moderately deep basal notches. Barbs resulting from the basal notching have a slightly excurvate shape with a pointed termination. Although ultraviolet spectrum light was not used to verify the tool stone source, the physical appearance of the stone is consistent with Cretaceous age material derived from the Edwards Plateau of central Texas. Although cherts in the locally available John's Valley Shale formation have similar characteristics to Edwards material, the Atoka County specimens are readily identifiable as Edwards chert. Don Wyckoff examined photographs of the ten spear points and confirmed their classification as material from the Edwards Plateau. The material colorization varies somewhat among the specimens and grades from a root beer brown to the dark blue/gray hues of the Oil Creek Edwards variety to the more common medium gray Edwards with white inclusions. Three of the pieces are broken, probably from the pressure of a cow's hoof. Most of the intact points also have some degree of lateral edge damage from cattle trampling.

Basic measurements were taken on the specimens. These include length, width at the shoulder, width at one-half the length, maximum thickness, length of the stem, width of the stem, and depth of the left and right notches (all measurements are in millimeters). Notes were also taken on the condition of the spear point and any other distinguishing characteristics. The central tendencies of the eight points are presented in Table 1 with detailed measurements for each piece presented below.

Figure 4. Eight of the nine spear points.

Figure 5a. Basal notched spear points, Specimen 1.

Specimen Number 1 (Figure 5a)
Length: 121.31 Width/Shoulder: 68.1 Width/ ½ Length: 65.11 Thickness: 11.74 Stem Length: 20.24
Stem Width: 15.18 Left Notch Depth: 21.03
Right Notch Depth: 21.75 Condition: complete; slight damage, right lateral edge

Figure 5b. Basal notched spear points, Specimen 2.

Specimen Number 2 (Figure 5b)
Length: 136.44 Width/Shoulder: 69.97 Width/ ½ Length: 56.79 Thickness: 8.82
Stem Length: 21.43 Stem Width: 14.75 Left Notch Depth: 20.98
Right Notch Depth: 21.35 Condition: complete; damage left lateral edge, right barb broken

Figure 5c. Basal notched spear points, Specimen 3.

Specimen Number 3 (Figure 5c)
Length: 116.88 Width/Shoulder: 54.05 Width/ ½ Length: 49.76 Thickness: 8.82
Stem Length: 21.11 Stem Width: 15.29 Left Notch Depth: 15.22
Right Notch Depth: 16.59 Condition: complete; slight damage near distal termination

Figure 5d. Basal notched spear points, Specimen 4.

Specimen Number 4 (Figure 5d)
Length: 92.92 Width/Shoulder: 48.95 Width/ ½ Length: 45.62 Thickness: 8.71
Stem Length: 18.37 Stem Width: 16.88 Left Notch Depth: 15.59
Right Notch Depth: - Condition: complete; right barb broken

Figure 6a. Basal notched spear points, Specimen 5.

Specimen number 5 (Figure 6a)
Length: 96.47 Width/Shoulder: 46.01 Width/ ½ Length: 45.67 Thickness: 7.73
Stem Length: 19.07 Stem Width: 16.88 Left Notch Depth: 13.49
Right Notch Depth: - Condition: complete; right barb broken

Figure 6b. Basal notched spear points, Specimen 6.

Specimen Number 6 (Figure 6b)
Length: 82.09 Width/Shoulder: 45.19 Width/ ½ Length: 42.5 Thickness: 8.33
Stem Length: 19.23 Stem Width: 15.45 Left Notch Depth: 12.82
Right Notch Depth: - Condition: complete; left barb broken

Figure 6c. Basal notched spear points, Specimen 7.

Specimen Number 7 (Figure 6c)
Length: 113.78 Width/Shoulder: - Width/ ½ Length: 54.66 Thickness: 10.02
Stem Length: 16.77 Stem Width: 16.55 Left Notch Depth: 16.85
Right Notch Depth:- Condition: fragmented; right barb broken, stem broken (refit)

Figure 6. Basal notched spear points, Specimen 8.

Specimen Number 8 (Figure 6d)
Length: - Width/Shoulder: 90.64 Width/ ½ Length: - Thickness: 8.52
Stem Length: 18.73 Stem Width: 16.35 Left Notch Depth:-
Right Notch Depth: - Condition: fragmented; both barbs, midsection broken

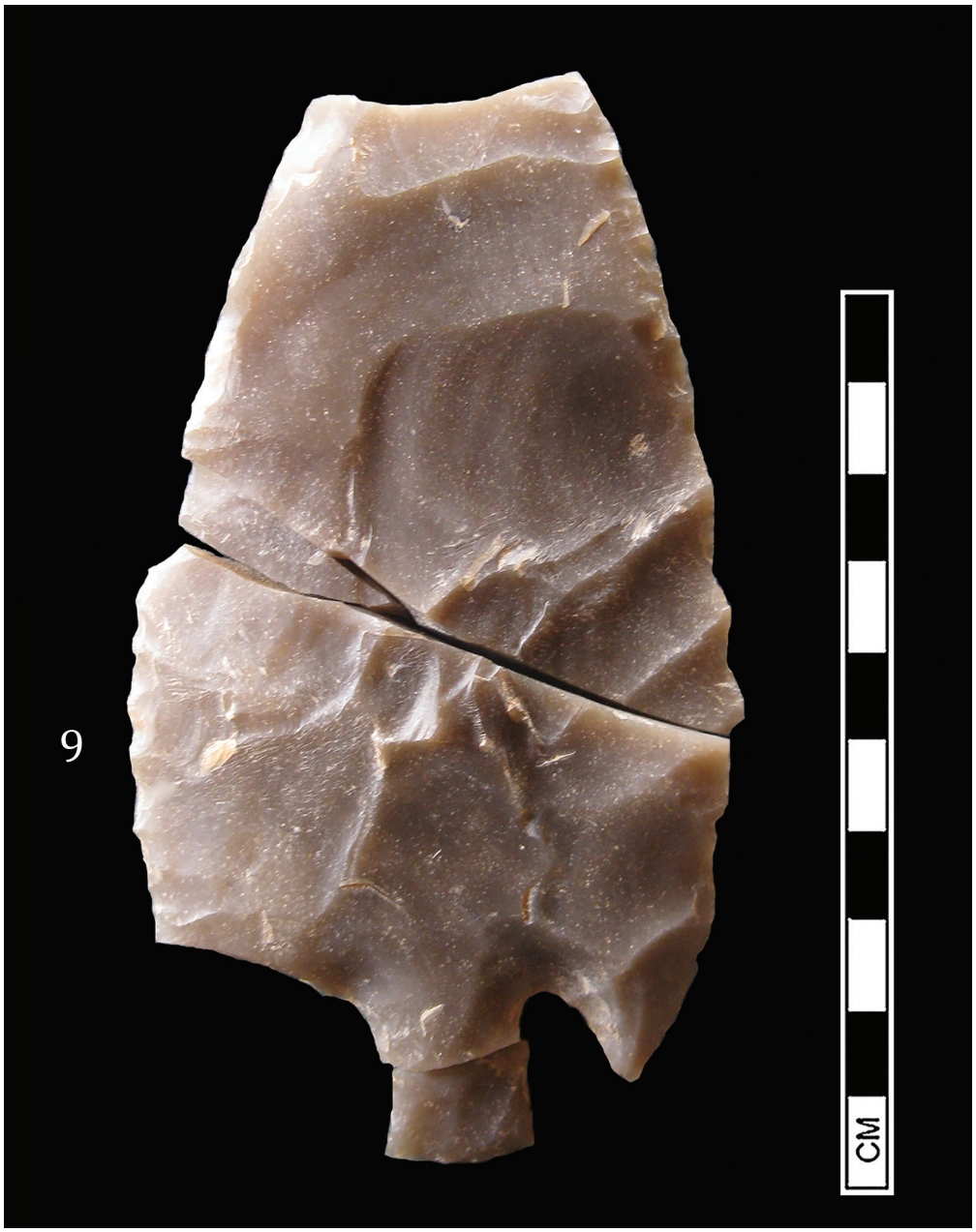

Figure 6. Basal notched spear points, Specimen 9.

Specimen Number 9 (Figure 6e)
Length: - Width/Shoulder: - Width ½ Length: 1 Thickness: 10.53
Stem Length: - Stem Width: - Left Notch Depth: -
Right Notch Depth: - Condition: fragmented into four pieces

Discussion

There are a number of points of discussion for the pieces described in this study. These issues pertain to stylistic attributes of the specimens and their age, to the spear point characteristics, and to the aggregation of these artifacts.

Stylistic Attributes

The Atoka County spear points represent moderately large ovate bifaces (over 10 cm in length and six cm in width) that are basally notched with moderate barbs. The stems are relatively short and only slightly elongated (a length to width ratio of 1.2). The difficulty arose when attempting to identify them with a well-known type or style. I examined the literature for basally notched specimens from the surrounding region and found three possibilities. It would be tempting to incorporate them into the well-documented Calf Creek type. Calf Creek spear points and their synonymous types in Texas (Andice and Bell) are large ovate bifaces with deep basal notches and pronounced barbs (Wyckoff 1994). Calf Creek, Bell, and Andice are generally acknowledged as dating to the Middle Archaic of some 5000 years ago. The Atoka County specimens fall within the range of Andice points, (Chris Lintz, personal communication). They also display many of the manufacturing trademarks of the Calf Creek, well-defined basal notches and pronounced barbs, as well as exhibiting the refined soft hammer percussion signature of Calf Creek spear points. However, the stem is considerably shorter in length and narrower than most Calf Creek, Bell, or Andice spear points and the barbs do not exhibit the deep notches characteristic of these Middle Archaic period specimens (Wyckoff 1994).

Another spear point exhibiting basal to corner notches and an ovate form is the Marshall (Bell 1958:44). Marshall point basal notches are not as deep as those observed for Calf Creek, have less pronounced barbs, a broader stem, and are somewhat smaller. They also frequently tend to being corner-notched rather than basally notched. The Marshall spear point is generally associated with the Late Archaic /Early Woodland time period of some 2000-4000 years ago. The Atoka County pieces do resemble the more basally notched Marshall although they exhibit deeper basal notches, have narrower stems, and are considerably larger.

A third basally notched spear point documented for the region is the Ouachita or Little River spear point (Perino 1976, 1980). Although not extensively documented, limited data point to the Ouachita being a large biface with moderately deep basal notches and barbs that resemble those of the Atoka County specimens. A cache of four Ouachita points manufactured of quartzite was found in McCurtain County, Oklahoma (Perino 1980). Another cache of five Ouachita points, also made of quartzite was found in Feature 4 at the Edward Abbey Memorial site (34AT268) in McGee Creek Reservoir (Ferring 1994:292). Ferring (1994) considers the feature holding the cache as being associated with Component II at the site that dates to the Late Archaic period (2500-2000 years ago). The Edward Abbey Memorial site is approximately 33 km southeast of the cluster of artifacts discussed here. It appears that the Atoka County specimens most closely resemble the Ouachita spear point. They have somewhat narrower stems, but this could be a function of the Atoka County specimens being manufactured from the higher quality Edwards chert rather than Ouachita Mountains quartzite.

From this comparative analysis, the Atoka County artifacts are Ouachita/Little River spear points that date to the Late Archaic period. It is also notable that Ouachita points have been documented in caches from southeastern Oklahoma.

Based on their stylistics characteristics, it is tempting to argue that the same individual manufactured all of the points. All nine spear points exhibit the same refinement in blade and stem preparation. A

correlation (Pearson's r) of total length and width of the point at half the length resulted in an r-value of .81. This suggests that flake length was probably a strong determining factor in width of the blade (Figure 7). To better understand the shape of the Ouachita spear point shape, a ratio of width at half the length divided by total length was used as a proxy for shape (Figure 8). Higher ratios would reflect a broader blade and a lower ratio would result in a more narrow blade form. Specimen #1 has the widest blade whereas Specimens #2 and #3 have more narrow blades. Specimens #4-7 are clustered around .50. But, they all fall within about a 10-point range (.42-.53). Thickness of the specimens is somewhat more variable (Figure 9). It would appear that there is considerable homogeneity among the nine pieces. If an individual knapper were responsible for their manufacture, they are probably making a conscious effort to control for variation. Of course, the existing variation may simply reflect differential size of the tool stone blank, which would affect the product outcome.

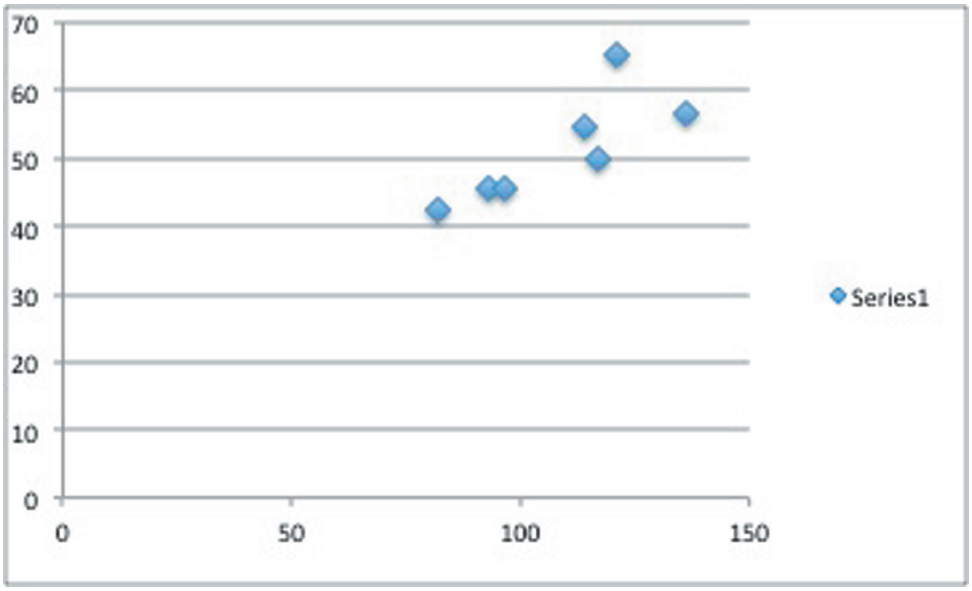

Figure 7. Graph plotting length and maximum width of spear points from Atoka County (x axis = length; y axis = width at ½ length)

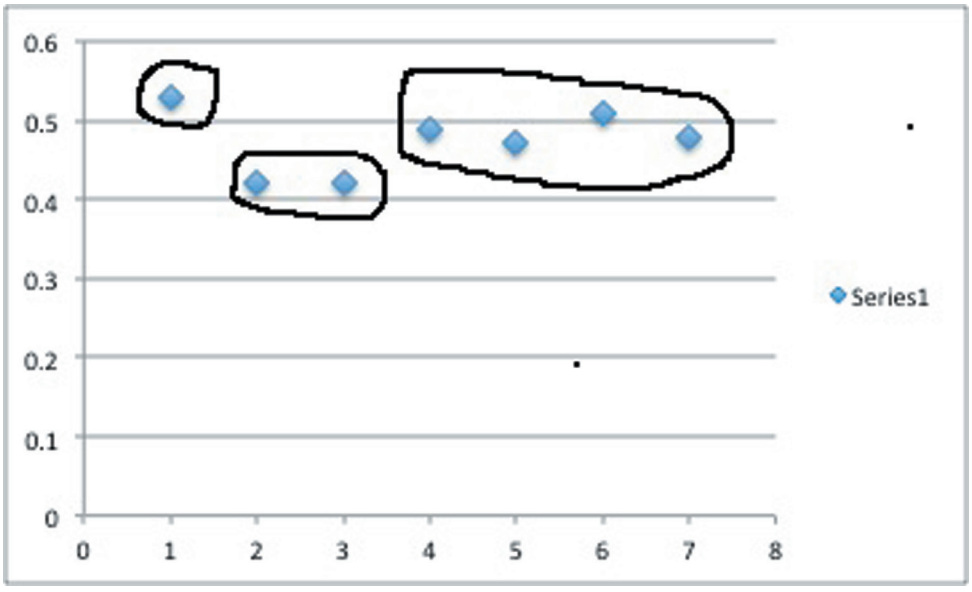

Figure 8. Ribbon graph plotting shape of Atoka County spear points (x axis = specimen number; y axis = ratio of width at ½ length divided by length)

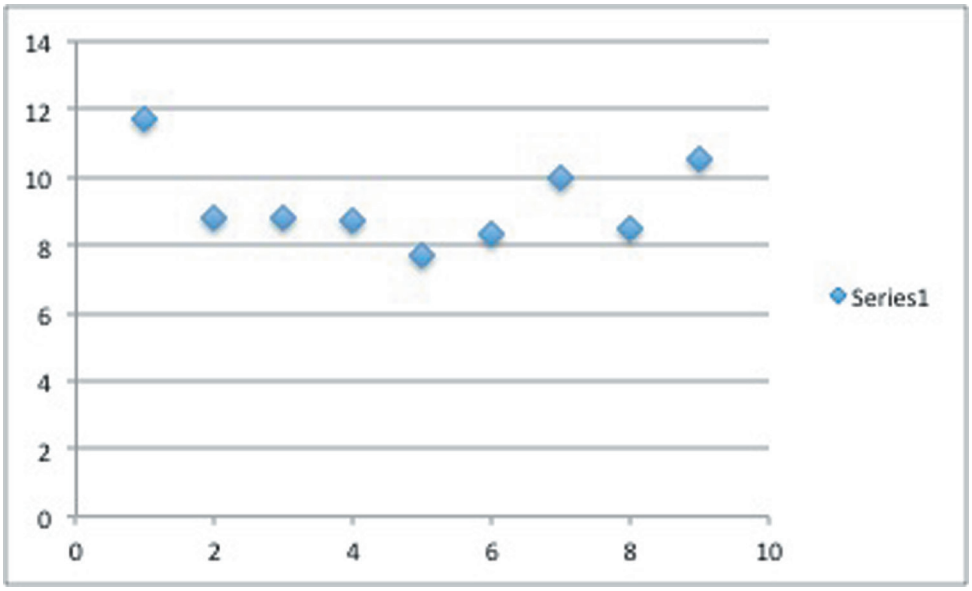

Figure 9. Ribbon graph plotting thickness of Atoka County spear points (x axis= specimen number; y axis= maximum thickness).

It would have been interesting to compare the Ouachita spear points from the Atoka County aggregate to those documented by Ferring (1994) and Perino (1980). However, it proved difficult to identify the five Ouachita spear points in the data tables for the Edward Abbey Memorial site (Ferring 1994: 599-616) and Perino (1980) provided no measurement data for the four McCurtain County specimens.

Spear Point Characteristics

Spear points used during the Archaic period were multi-purpose tools. They served as a weapon (a projectile), were used as a knife to butcher game, and to occasionally gouge and scour items. These multiple uses would ultimately lead to dulling of the lateral edges of the spear point that would require sharpening. Sharpening was a continual process and ultimately led to exhaustion of the tool. Alternatively, they were sometimes retooled for use as a scraper, graver, or drill after exhausting the blade. In other instances, the tool would break during use or sharpening also resulting in recycling to another purpose. Typically, Archaic spear points reflect this range in maintenance activities. Many exhibit reduction in the width of the blade due to continuing maintenance. Others are transformed into scrapers, gravers, and drills as noted above. The Ouachita specimens in this study are somewhat unique in that they display only minimal maintenance. The blade or body for seven of the specimens exhibits excurvate lateral edges, reflecting a minimal amount of sharpening or maintenance. The other two (Specimens 2 and 8) have somewhat more triangular blade shapes, but are not extensively reworked. Examination of the lateral edges using a hand lens revealed some maintenance and/or final edge treatment. However, the right barb is missing from many of the pieces. This breakage pattern could be a function of use as a knife. It might also reflect the cattle trampling that damaged many of the spear point, but it would be unusual that this disproportionately affected the right barb. The nine points appear to represent an aggregate of tools that were recently manufactured and had not experienced a great deal of use. What cannot be resolved is whether this group of points was planned for future domestic use (hunting, butchering of game, etc.) or for some non-domestic purpose.

Artifact Aggregation

Artifact aggregation can be expressed in a number of ways. There may be a large volume of associated material discarded in midden contexts. You can also have aggregation of a large number of artifacts derived from a particular activity, for example, tool manufacture and knapping debris. Another artifact aggregate results from the planned placement of artifact clusters at a given location. This is what takes place with caching activity and also with funerary offerings to a deceased member of the society. Attention is focused on caching as an expression of artifact aggregation.

There have been a number of caches or cache-like artifact aggregations documented for the Archaic period in Oklahoma. Calf Creek groups are particularly noted for their caching behavior (cf., Primrose [34MR65], Wyckoff, Neal, and Duncan 1994; and Stilman Pit [34MR71], Bartlett 1994). The Primrose and Stilman Pit sites represent locations where large blanks were stored for future manufacture. Both sites contain large flake blanks, unfinished bifaces, completed Calf Creek spear points, and some debris from tool manufacture. They also show some evidence of at least temporary use for habitation.

There are also caches or apparent caches related to the Ouachita spear point. As previously noted, five Ouachita/Little River spear points were found in Feature 4 at the Edward Abbey Memorial site (34AT268). These were in a pit associated with vertically positioned sandstone slabs and cobbles, some 42 cm below surface (Ferring 1994:290-292). Site 34AT268 was one of the most intensively occupied sites documented at McGee Creek Reservoir. The other cache comes from McCurtain County near the juncture of Cypress Creek and Little River (Figure 10; Perino 1980:9). Weyerhaeuser pine planting exposed this cluster of four spear points made of Ouachita Mountains quartzite. There was no indication as to whether these were an isolated occurrence or found within a residentially used locale. However, there are numerous recorded sites in the immediate vicinity, making it likely that these points were also from a residential site context.

The documented cache-like collections of material can be interpreted as a logistical function. The Primrose and Stilman Pit sites contained material that was stockpiled for future use in spear point manufacture. Considering that large blanks were necessary for preparation of the relatively large Calf Creek point, it was not cost-effective to transport the tool stone, assuming that Calf Creek groups were highly mobile hunters and gatherers. It would have been much more practical to store the material at a marked location and return periodically to re-tool. The cache of Ouachita spear points found at the Edward Abbey Memorial site was intentionally placed in the pit. Assuming that the group was nomadic and this site was one in a series on a seasonal round, the cache may have been left for a return visit. A similar practice is also possible for the McCurtain County Ouachita spear point aggregate although this is only an inference based on the presence of a number of nearby residential sites.

The aggregate from Coal County differs markedly in that only complete spear points were present; there was no evidence of bifacial or flake blanks, unfinished bifaces, or other tools forms. The location also holds no suggestion of use as a residential site-even one of temporary nature, and no evidence of burial association.

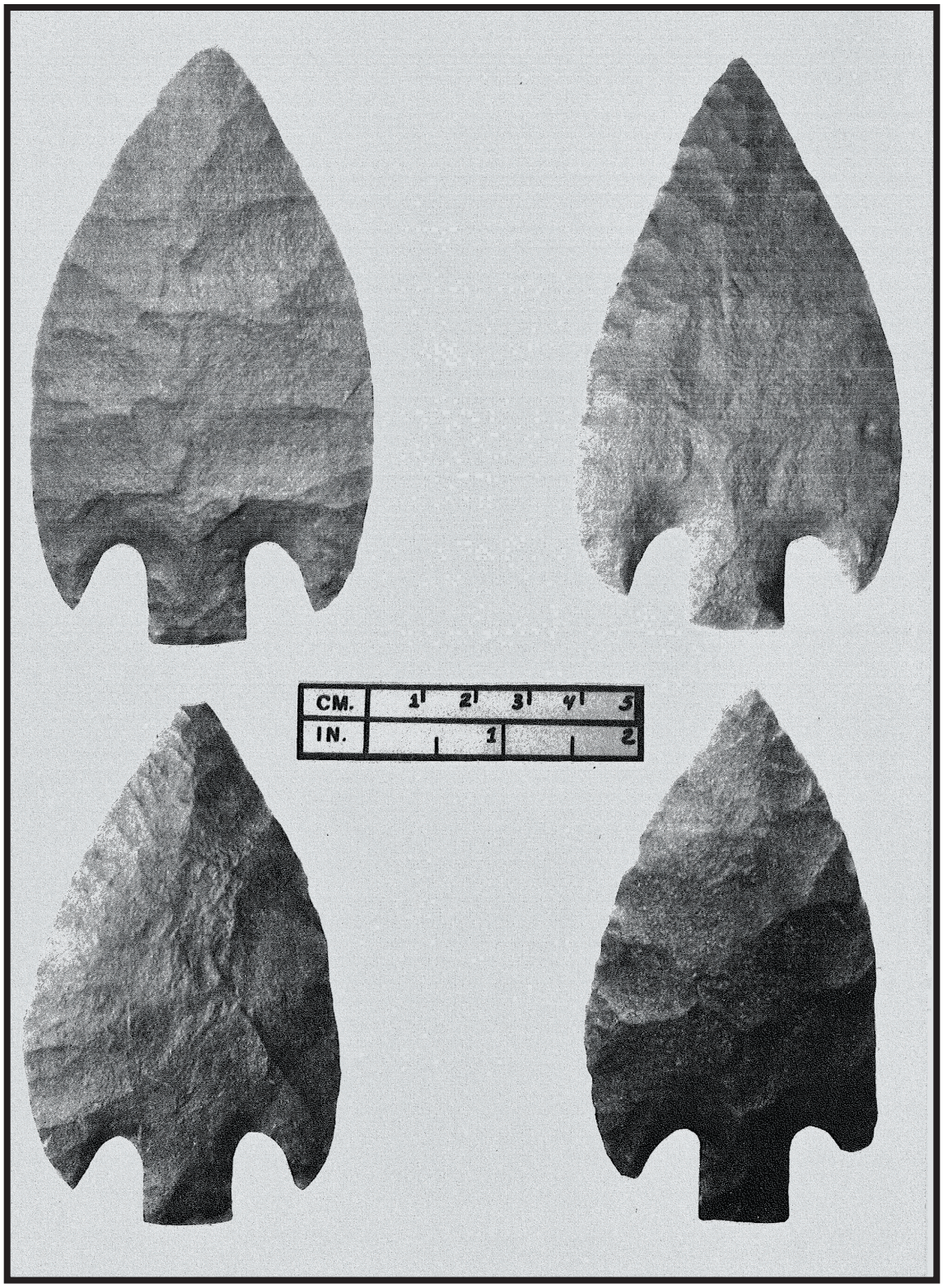

Figure 10. Four Ouachita spear points found in McCurtain County.

Thus, the cluster of Ouachita spear points described in this study does not have a logistical function or a funerary context. Considering that these are finished pieces, why not simply include them among the group's gear? The nine spear points would not represent significant baggage in respect to transport. It could be argued that perhaps these were funerary offerings. However, there was no suggestion of human remains or even a pit-like feature at the location. And, there was also no indication that this was a residential place. There is, however, another consideration. In an article published a number of years ago, I discussed the concept of planned versus unplanned abandonment (Brooks 1993). While this discussion focused on village farming societies and their use/abandonment of dwellings, the concept can be expanded to that of artifact aggregates. In contexts such as the one outlined in this study, artifact aggregates are often considered to be caches. Caching is a planned activity. But, what if the artifact aggregation was an unplanned event? The Atoka County Ouachita spear point cluster could have been contained in a leather pouch that was dropped or otherwise lost during the group's travel. It would have been an unplanned event, which would account for the absence of a functional explanation for the spear point's seemingly absence of a logistical context. The Ouachita spear point cluster was found only a few inches below ground surface. It is plausible that the points were lost by a band member and were gradually and shallowly buried by downslope movement of soil (and perhaps wind-blown deposits as well). This explanation would account for the differences from what is typically found in a cache.

That being said, I cannot totally exclude these caches having some meaning within the context of ritual. Currently, most of the documented Ouachita/Little River spear points have been found as aggregates. I visited the Museum of the Red River hoping to find additional details on the McCurtain County "cache" but apparently Greg Perino did not leave this file. The museum collections were also examined for additional examples of Ouachita/Little River spear points. Two Ouachita points of Ouachita Mountains quartzite were identified, although their provenance is unknown. Thus, it is unclear whether they were found together or from separate locales. Two very large pieces made of unheated Novaculite identified as Little River points were examined as well (Figures 11-12). Although their provenance is not specifically known, they were apparently found in McCurtain County. Examining the Novaculite specimens, three thoughts surfaced. First, the two pieces are so similar in size and material that they were potentially from the same site. Second, the spear points are sufficiently large that I doubt that they were intended for domestic use. The two spear points are 140 mm long, 94 mm wide and 185 mm long, 81.8 mm wide. The somewhat spatulate distal termination would not be particularly functional as a projectile although they would be functional as knives. Third, I question whether Oauchita points and Little River points bear much of a relationship other than being basally notched. Although Greg Perino suggested a relationship in his article on the Ouachita points (Perino 1980), the two styles appear to be substantially different. Little River spear points are extremely large, sufficiently so to be viewed as ceremonial blades. Their manufacture also appears to lack the refinement of Ouachita points, although this could be a function of the coarse-grained nature of unheated Novaculite. We should be cautious in identifying Ouachita and Little River spear points as synonymous styles.

Figure 11. One of two Little River spear points identified for McCurtain County.

Figure 12. Two of two Little River spear points identified for McCurtain County.

Concluding Comments

An aggregate of spear points from a locale in northern Atoka County has provided some new insights on the Ouachita, a poorly known style that dates to the Late Archaic period of some 2000-2500 years ago. Obviously, an isolated cluster of spear points presents constraints on the substantive information that can be gleaned from analysis. In this study, I have added to the data concerning Ouachita spear point size and morphology. This is also the first group of these spear points to be documented that were manufactured from a non-local tool stone (Edwards chert). The analysis also provided some understanding of the mechanics involved in their manufacture. From a behavioral perspective, study of this aggregate of points revealed that they were relatively unused tools. Within the context of the find, the utilization of the spear points is problematic: were they intended for domestic or non-domestic purpose? Perhaps the most telling finding of this study is that aggregates of spear points should not always be interpreted as caching activity. Caching should be studied as the consequence of group or individual activity, not as an activity in itself. If you examine artifact clusters such as the Atoka County spear points from the perspective of caching as a consequence of planned activity, some may not fit the caching model and be a result of other less planned actions. A question that awaits further study and perhaps resolution is whether these aggregates of Ouachita/Little River spear points represent caches used in ritual or have intended ritualistic purpose.

Notes

Acknowledgements: I am very grateful that our family from Atoka County brought their finds to my attention. The Ouachita spear points and their context have resulted in some interesting questions concerning aggregates of finished items and their purpose. Thanks are also due to Chris Lintz for sharing his database on caches for comparative purposes. Finally, I wish to thank the two reviewers for *Caddo Archeology Journal* that helped improve the article's clarity and catch some of the instances where the author's thought processes were ahead of his typing.

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Revisiting a Historic Manuscript: Vere Huddleston's Report on East Place (3CL21) Excavations

Mary Beth Trubitt and Linda Evans

Abstract

Vere L. Huddleston was one of several amateur archaeologists who excavated Caddo sites in Clark County, Arkansas, during the 1930s and 1940s. Huddleston took better notes about the sites and contexts of his finds than many of his contemporaries. His large collection of artifacts is now part of the Joint Educational Consortium's Hodges Collection in Arkadelphia. A manuscript on his excavations at the East Place – the largest Caddo mound group in Clark County – is presented here with new vessel documentation and grave lot information. Since many of these artifacts have appeared in previous publications with little description, this work provides context for interpreting the site and its placement in the Caddo Indian history of this region.

Editors' Introduction

Ancestral Caddo Indians lived and farmed along the Ouachita, Caddo, and Little Missouri rivers in Clark County, Arkansas, between at least 1100 and 1700 A.D. (Early 2002a, b, c, d; Early, ed., 1993). Large populations in the Mid-Ouachita region during this time are evidenced by the large numbers of recorded mounds, sites, and cemeteries (Early 1982; Girard et al. 2014; Trubitt 2012a, b). The archaeological residues of these past communities have attracted interest and research for over two centuries. In 1804, William Dunbar and George Hunter, charged by President Thomas Jefferson to lead an expedition up the Ouachita River, stopped at a saline near present-day Arkadelphia. Digging two holes there, the men found "several pieces of Indian earthen pots, probably used by them in making salt," (Berry et al. 2006:87; archaeological sites such as Bayou Sel, 3CL27, and Hardman, 3CL418, were later recorded in this vicinity, Early, ed., 1993).

Archaeological sites and the Caddo pottery in this area drew the attention of museums and collectors across the country, and digging was viewed as a source of income to some residents even before the Depression. A note by Vere Huddleston relates that "according to L. E. Tenneson of Arkadelphia, he and another student of Henderson Brown (College) excavated enough pottery from these sites in the 1890s and sold it to a museum in Chicago, to pay their way through college," (Hodges Collection, SG 41-04). Some farmers would find artifacts while plowing their fields, and often the pots would be destroyed. Many pots were dug from burial mounds and sold to collectors (Evans 2011:3).

During the Depression, a group of amateur archaeologists from Arkadelphia, Arkansas, made attempts to preserve these artifacts, keep them in this area, and make a record of the sites where they were found. Vere Huddleston, Robert Proctor, Charlie Richardson, as well as Dr. Thomas L. and Charlotte Hodges of Bismarck, were important figures in the history of Caddo archaeology in Arkansas (Girard et al. 2014). Some of our knowledge of this pottery, these archaeological sites, and the Caddo Indians who once lived in Clark County comes as a result of this Depression-era work by amateurs who not only preserved the pottery, but also took notes on their excavations. At this time, the concept of stewardship was in its early development, but in some cases these amateurs were early adherents to many of the ethical principles that American archaeologists follow today (Early 1986; Evans 2012). Robert Proctor, Charlie Richardson, and others donated

many of the artifacts they collected to the Henderson State University (HSU) Museum, under the directorship of Dr. P. G. Horton in the 1950s. Dr. Cynthia Weber and Dr. Ann Early managed the museum between the 1970s and 1990s as part of their duties as Arkansas Archeological Survey's HSU Research Station archaeologists, and researched and documented Caddo vessels in the collections (e.g., Early 2012; Weber 1972). Since the HSU Museum closed, its American Indian artifact collection has been on loan to the Historical Arkansas Museum in Little Rock (Historic Arkansas Museum 2014).

Vere Huddleston was one of the amateur archaeologists active in Clark County during the 1930s-1940s (Figure 1). "Mr. Huddleston was the only member of his group to keep substantive records of his discoveries, and Huddleston's notes, along with his artifacts, are another invaluable and irreplaceable corpus of primary data about regional archeology," (Early 1986:4). After Huddleston's death in 1946, his collection of pottery and extensive site notes and papers were sold to Dr. and Mrs. Hodges. The Hodges collection was acquired by the Joint Educational Consortium (JEC) in 1977, and has been curated by the Arkansas Archeological Survey's HSU Research Station ever since (Early 1978, 1986; Trubitt 2007). Among Huddleston's notes, now in the HSU Archives, was an unpublished article on his excavations at the East Place, a multiple mound site now recorded as 3CL21. The lack of published data about this important site led us to revisit this manuscript in an attempt to glean new information about the archaeology of this region.

Figure 1. The Three Amateur Archeologists of Arkadelphia, 1940 (inscription on reverse also identifies, left to right, Charles Richardson, artist, Vere L. Huddleston, principal, Arkadelphia High School, and Prof. Robert Proctor, HSTC; Henderson State University Archives, Hodges Collection, SG 41/04 F7).

Vere Huddleston was born on the 23rd of December, 1898, to Minnie C. and Flemon Huddleston, farmers who lived in Hale, in Garland County, Arkansas (Evans 2012:14). He married Mary in 1922, and by the 1930 census, he was a teacher in a public school in Arkadelphia, Arkansas. At the time of his death in 1946, he was the principal of Arkadelphia High School (Evans 2012:14). He was "an authority on Arkansas Indians, particularly the Caddo tribe … and his collection of Indian relics included several thousand individual items, including 1,000 pieces of pottery which had been catalogued. Mr. Huddleston was one of the pioneer archaeologists of the Caddo Indians," (Richter 1992:564). Huddleston (1943) published one article, "Indians in Clark County," in the *Arkansas Historical Quarterly*.

Huddleston's artifact collection and notebooks became part of the Hodges collection after his death, and Dr. and Mrs. Hodges included the Huddleston material (then tabulated at 400 vessels) in their published descriptions of pottery from the Middle Ouachita River region (Hodges and Hodges 1945; the Hodges catalogue from 1946 notes the purchase of Huddleston's collection of "approx. 350 pieces of pottery," so the 1000 pieces mentioned above seems to be inaccurate). The Hodges Collection, now owned by the Joint Educational Consortium, is important because most of the artifacts came from a cluster of sites in Clark and Hot Spring counties in west-central Arkansas. It is also historically significant for Caddo archaeology because Philip Phillips of Harvard University and Alex Krieger of University of Texas visited Thomas and Charlotte Hodges, Vere Huddleston, and Robert Proctor, and photographed pottery vessels in their collections. Some of these were used to illustrate types in the *Handbook of Texas Archeology* (Suhm and Jelks 1962; see also Early 1986; Newell and Krieger 1949:vii). Phillips' photographs of many of the Hodges Collection vessels in 1939, along with his note cards (on file at the Arkansas Archeological Survey's HSU Research Station), were instrumental in Early's (1978) identification of artifact provenience in the JEC Hodges Collection after 1977.

Based on notes now in the HSU Archives, Vere Huddleston dug graves at East Place (3CL21, see Figure 2) between April, 1939, and January, 1943. While a sketch map exists, his location descriptions are vague. Most of the graves were dug in and adjacent to a mound on the site's west side. Grave lot associations are clearer, and by matching dates, descriptions, and catalogue numbers, it has been possible to reconstruct grave lots for 18 graves dug by Huddleston (Table 1). In some cases, artifacts from a grave were divided between the excavators (typically Huddleston, Proctor, and Richardson), and therefore vessels from the same grave may be separated between the JEC Hodges and the HSU Museum collections.

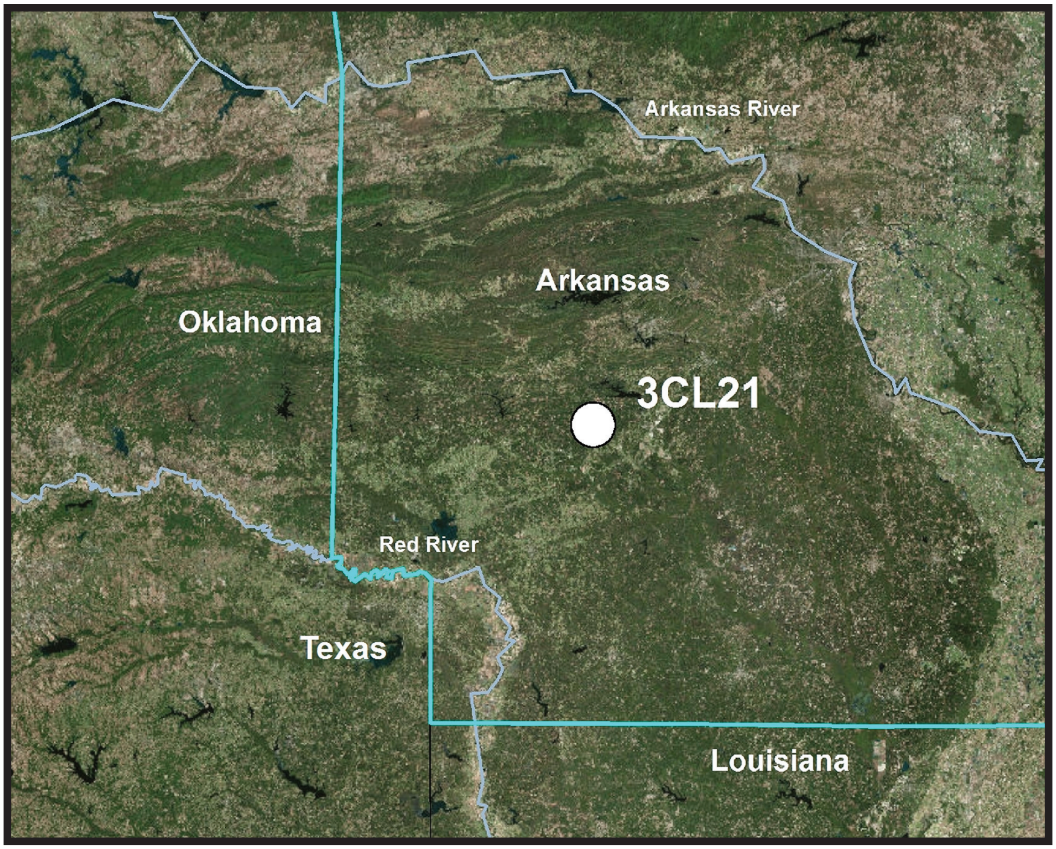

Figure 2. Approximate location of East Place (3CL21) in southwest Arkansas (map created by Katie Leslie, Arkansas Archeological Survey, 2014).

Table 1. Reconstructed Grave Lots from Huddleston's East Site Excavations.

Grave Number	Huddleston/Hodges Cat. #	Cat. #	Huddleston Description	3CL0021: Prov/Item		AASurvey Documentation: Vessel Form
First set:						
Grave 1 and/or 2	197	1374		1	48	bowl, carinated
4/29/1939	198	1375		1	49	bowl, carinated
[late Social Hill to Deceiper phase]	199	1376	engraved red ware carinated bowl (sketched)	1	36	bowl, carinated, tall rim
	200	1368	whole piece (sketch - bottle)	1	12	bottle
Grave 3, 20" deep on original soil	201	1380	1 of 3 broken pieces (sketch - jar) [201 = 1380?]	1	41	jar, tall rim
4/29/1939 – 5/5/1939	202	1373	1 of 3 broken pieces, cazuela / hanging bowl with scalloped rim	1	34	bowl
[late Social Hill to Deceiper phase]	203		1 of 3 broken pieces, cazuela			
	204	1379	cazuela	1	32	bowl, carinated
	205		jar			
	206		jar			
	207	1371	bottle, perfect (sketch)	1	13	bottle, pedestalled
	208	1372	human effigy bottle, perfect (sketch)	1	50	bottle, effigy, pedestalled
Grave 4, 6' east of other graves	222		badly broken, part of deep bowl			
5/27/1939	223		badly broken, jar			
[late Mid-Ouachita to Social Hill phase]	224	1412	badly broken, large jar 1412 [224=1412?]	1	42	jar, tall rim
	225		small vase			
	226	1388	deep bowl, small, notched rim [226 = 1388?]	1	35	bowl, simple
	227	1384	deep bowl, large, notched rim [227 = 1384?]	1	39	bowl, simple
	228		plain water bottle, neck broken			
	229	1387	badly broken cazuela (sketch, 228 almost ident.) [229 = 1387?]	1	38	bowl, carinated
	230		badly broken cazuela			
Grave 4A, 5/27/1939	231		Ritchie ruined one with shovel, Huddleston recovered it			
South of other graves:						
Grave 5, no trace of bone, 24" deep, 2 graves?	232		pipe, broken (sketch)			
6/7/1939	233		bottle (sketch) [Crockett Curvilinear-Incised]			
	234		pot (sketch) [cogged rim bowl?]			
			pot, to Whaley			
			bottle, Glendora ware, to Ritchie			
West side of the mound/next to the slough:						
Grave 6, 12" deep	235		bottle, crushed (sketch) [Keno Trailed]			
6/10/1939	236		cazuela, cone-shaped, partial (sketch)			
	237		vessel, partial			
	238 to 240		3 bone awls			
	241		bottle, Glendora ware, crushed (sketch)			
	242		vessel, whole			
	243		skull			
			broken bowl, to Whaley			
Base of Mound C:						
Grave 7, shallow	1					
8/5/1939	2					
[late Social Hill to Deceiper phase]	244 - 4	2098	cone shaped cazuela (sketched)	1	33	bowl, carinated
	245 - 3	2097	water bottle, Glendora ware	1	16	bottle, pedestalled
	245		small bowl covered with 6 rim projections (sketched)			

Type/Variety	Surface/Decoration	Descriptive	Temper	Comments
Means Engraved	engraved	Erie 1 :: Enos 9?	shell (lchd) & grog	partial vessel, reconstr. from sherd lot
Means Engraved	engraved	Enos 4? 5? :: plain	grog & shell (lchd)	
Means Engraved ?	engraved	Elgin 12 :: Enos new	grog & shell (lchd)	partially reconstructed with plaster
Keno Trailed var. Red Hill	incised/trailed	plain :: Belhaven 31	shell (leached)	probe hole at shoulder
Cowhide/Foster T-I	incised/punctated	Chatham 9 :: Baker 16? 21?	shell (leached)	nodes on body
Maddox Engraved	engraved/notched lip/slip?	Cornell :: Elmira? Erasmus?	none visible	2 opposing rim tabs with suspension holes
Means Engraved	engraved	Enos 15? 16? :: plain	grog & shell (lchd)	2 small nodes at base of rim; partial vessel
Keno Trailed	incised/trailed	plain :: Belhaven 32	grog & grit	3 nodes on pedestal, fireclouding
Keno Trailed	incised/trailed/modeled	plain :: Baker 27 ?	shell (leached)	2 human faces on opposite sides
	brushed/punctated	Dana 14 :: Danbury 2?	shell (leached)	sooting, fireclouding; reconstr. from sherd lot
	notched lip	Cornell :: plain	grog	similar to Hardman Engraved in shape, lip notching
	notched lip	Cornell 7 :: plain	grog & shell (lchd)	partial v.; sim. to Hardman Engraved
Glassell Engraved ?	engraved/punctated	Enos 10? 11? 12? :: plain	shell (lchd) & grog	
Means Engraved	engraved	Enos 14 :: plain	shell (lchd) & grog	some fireclouding, 2 nodes at rim/body juncture
Keno Trailed var. Red Hill	incised/trailed	plain :: Belhaven 33	shell (some lchd)	reconstructed, plastered

Table 1. Reconstructed Grave Lots from Huddleston's East Site Excavations (cont.).

On top of the mound:						
Grave X, no bone, 4 crushed pots		2490	incised red slip bowl (sketched)	1	9	bowl, simple
5/9/1941		2491		1	1	bowl, simple
[East phase]		2492	incised red slip bowl (sketched) [sketch does not match 2492]	1	5	beaker
		2493	incised/punctated jar (sketched)	1	28	jar, short rim
On ramp or saddle between mounds:						
Grave X or Y, tooth crowns, 3 pots, 40" deep	1	2511	crushed pot			
12/6/1941	2	2512	crushed pot	1	23	bottle
[Mid-Ouachita phase]	3	2513	crushed pot	1	47	bottle
In small burial mound just N of the 4 large mounds:						
found by Dr. Ritchie, May 1942		2641	wood duck head, carved wood, semi-charcoal state, pigment	1	11	effigy adorno, carved wood
No provenience noted:						
September, 1942 [East phase]			Labeled "East Sept. 42" on base	1	10	jar, short rim
No location indicated:						
Grave XX, 18" deep, trace bone, 4 pots, red ochre		2642	perfect / incised red ware (sketched)	1	22	jar, tall rim
9/19/1942		2643	struck with shovel and needs repairing / incised jar (sketched)	1	21	jar, short rim
[East to Mid-Ouachita phase]			Mr. Charlie took bottle, plain, with small tall neck			
			Mr. Proctor took small slip bowl similar to Hudd 1305			
In mound:						
Grave A, 6' deep, 1 crushed bottle, skull in ash			crushed bottle			
11/14/1942		2693	skull (from Grave A?)			
Grave A' (next to A, depth 6'6") 15 pots, no bone		2688	plain bottle of red slipware (sketched)	1	30	bottle
11/14/1942		2689	incised jar (sketched)	1	4	jar, tall rim
[East phase]		2690	engraved red ware (sketched)	1	19	beaker
		2691		1	46	jar, tall rim
		2692	bottle, engraved red ware (sketch)	1	31	bottle
			Proctor took large beautiful bowl about a gallon capacity			
			(another 9 vessels originally in grave, no info)			
			long stemmed platform pipe			
			celt			
No location indicated:						
Grave B, 18" deep, 8 pieces of pottery (3 effigies)		2694	effigy pot / incised red slip effigy bowl (sketched)	1	14	effigy bowl
11/21/1942		2695	engraved beaker (sketched)	1	3	beaker
[East phase]		2696	bottle, engraved (sketched)	1	2	bottle
		2697	celt	1	45	celt
		2698 to 2707	10 small points (10 to Hudd, 10 to Mr C, 9 to Mr Proctor)			
			pot, Mr C			
			effigy pot, Mr C			
			effigy pot, Mr P			
			pot, Mr P			
			pipe, Mr Proctor			

East Incised	red slipped/incised	Barrington 10 :: plain	grit	rim tabs, abrasion on base
East Incised	red slipped/incised	Barrington 9 :: plain	grog & grit	2 incised rim tabs
	plain	:: plain	grog & grit	badly broken, missing rim
	incised/punctated	Caldwell 3 ? :: Claflin	grog	reconstructed; related to Sinner Linear-Punctated?
Adair Engraved	engraved/appliqued	Eagle 3 :: Eric 1	grog	
	engraved	plain :: Elmira 60? Elmhurst 9?	grog	sherd lot, not reconstructed
Karnack Brushed-Incised?	incised	plain :: Antioch 3	grog & grit	fireclouds
Pease Brushed-Incised ?	incised/applique	Butler 1 :: Alma 3?	grog	7 nodes around body, sooting
sim. to Military Road Inc.	brushed/incised/punctated	Dana 4 :: Altus 4	grog	broken rim; related to Sinner Linear-Punctated?
Smithport Plain	red slipped	plain :: plain	grog & claygrit	fireclouds
Pease Brushed-Incised?	incised/punctated	Caldwell 15 :: Antioch 14	grog & grit	or Dunkin Incised?
East Incised	red slipped/incised	Barrington 7 :: plain	grog & claygrit	suspension holes
	punctated/brushed	Andes? :: Danbury 1	grog	reconstr. from sherd lot
Hickory Fine Engraved	engraved	plain :: Erie 13	grog & bone	fire clouds
East Incised	red slipped/incised/effigy	Bates 15 or Barrington 5::plain	grog	animal head & tab on rim, reconstr. with plaster
East Incised?	incised	Bates 16 :: plain	grog & grit	2 suspension holes
Spiro Engraved?	red slipped/engraved	plain :: Evangel 1	grog & grit	3 circular panels of curvilinear engraving/excising

Table 1. Reconstructed Grave Lots from Huddleston's East Site Excavations (cont.).

Mound, south of center of mound:					
Grave C, 5' deep, 4 pots	2708	bottle	1	25	bottle
12/12/1942	2709	pipe stem, bowl deteriorated	1	15	long stem pipe
[East phase]	2710	perforated jar/beaker type jar, incised red ware (sketched)	1	18	beaker
	2711 to 2724	small point (14 of 19 to Hudd)			
		bottle to Proctor			
		perforated jar/beaker jar to Proctor			
		celt, Proctor			
Mound, west of center of mound:					
Grave D, 5' deep, no trace of bone	2725	bottle, crushed, Coles Creek ware, plain-red slip (cat card/sketch)	1	7	bottle
12/13/1942	2726	vase, crushed/ incised redware (sketched)	1	17	beaker
[East phase]	2727	copper covered artifact			
		pot, Proctor (urn-shaped pot in good condition?)			
Mound: grave on top of the mound:					
Grave E, in hard clay, only trace of bone	2729	pot, crushed / incised jar (sketched)	1	20	jar, tall rim
12/18/1942	2730	large crystal	1	27	quartz crystal
[East phase]	2731	arrow			
	2732	copper covered object			
		good pot to Proctor			
		pipe to Proctor			
		large crystal to Proctor			
No location indicated:					
Grave F, 6' deep	2742	bottle, in good shape (sketched)	1	24	bottle
1/1/1943	2743	pot, crushed			
[East phase]	2744	pot, crushed / incised jar (sketched)	1	29	jar, tall rim
	2745	pot, crushed / engraved jar (sketched)	1	8	jar, tall rim
	2746	pot, crushed	1	44	bowl
	2747	pot, crushed	1	43	beaker
	2748	crystal	1	26	quartz crystal
	2749 to 2755	small point (7 to Hudd, 7 to Proctor)			
		bottle, in good shape, to Proctor			
		pot, crushed, to Proctor			
		celt to Proctor			
		crystal to Proctor			
Mound, on top of mound:					
Grave G, 4' deep	2756	vase incised with punctates from rim to base (sketched)	1	37	jar, short rim
1/16/1943	2757	vase with inward sloping sides, rim perforations (sketched)	1	6	beaker
[East to Mid-Ouachita phase]	2758 to 2765	8 small points, Hudd			
		water bottle, to Proctor, beautiful red ware bottle			
No provenience noted:					
? date [East phase?]		No number, no info	1	40	jar, short rim

sim. to Hickory Fine Engr.	incised (dry paste)	Bates 9 :: plain	grog	pedestal base
East Incised	incised	Bates 3 :: plain	grog	2 suspension holes
Smithport Plain ?	red slipped ?	plain :: plain	grog & grit	heavily mended bottle
East Incised	incised	Barrington 1 :: plain	grog	suspension holes (2)
Pease Brushed-Incised	incised/punctated	Andes 10? :: Alma 3	grog	reconstructed
Smithport Plain	plain	plain :: plain	grog & claygrit	fireclouds, black residue on body
Pease Brushed-Incised	incised	Beloit 1 :: Alpha 2	grog	residue on base/ext.
Pease or Karnack B-I	incised/punctated	Case 8 :: Claflin 8	grog	heavily mended, 2 opposable rim tabs
East Incised	incised	Bates 3 or Barrington 1 :: plain	grog	reconstr. from sherd lot
East Incised	incised/red slipped	Bates 17? :: plain	grog	partial vessel, suspension hole
Military Road Incised	incised/punctated	Beloit 2 :: Clinton 12, Bard 2?	grog & claygrit	fireclouds, slightly castelated rim; pigment assoc.?
East Incised ?	engraved	Eckerd 2 :: plain	grog & grit	2 suspension holes
sim. to Smithport Plain ?	red color from ochre?	plain :: plain	grog & grit (mica)	human bone fragments in jar, no info

Phillips photographed eight of Huddleston's vessels from East Place. Krieger examined and photographed East Place vessels from both the Proctor and the Huddleston collections, the latter owned by the Hodgeses by that point, and illustrated several plates of East vessels in the George C. Davis monograph (Newell and Krieger 1949:vii, Fig.63-65). The description of East in the Davis monograph was brief since "[d] etails on the mound and graves are lacking" (Newell and Krieger 1949:210). Clarence Webb included East pottery in his description of the type Dunkin Incised and the Bossier focus, crediting Dr. and Mrs. T. L. Hodges and Alex Kreiger (Webb 1948:106). Again, the description of the site is brief. "Pottery from the East Mound, a Haley focus site on Antoine River in southern Arkansas, includes a number of vessels which have shapes similar to Pease vessels and decoration consisting of incised fields, often herringbone, separated by incisions, nodes or lines of punctates," (Webb 1948:113). Huddleston and his contemporaries referred to Caddo pottery and earlier pre-Caddo wares similar to Marksville or Coles Creek complexes; Webb and the Hodgeses used the Midwest Taxonomic System and referred to Haley and Mid-Ouachita foci (Girard et al. 2014).

By the late 20th century, archaeologists were defining phases that had geographic as well as temporal boundaries, reinforced by radiocarbon dates. In an unpublished paper on East Place ceramics based on vessels in the HSU Museum from the Horton, Proctor, Richardson, and Whaley collections, Cynthia Weber (1972) emphasized that there were multiple components at the site, not just the Early to Middle Caddo period material illustrated in earlier publications. Despite the lack of published information, East became the type site for the East phase, initially described by Weber (1972) and later defined by Early (ed., 1993; Early 2002a). A sequence of phases -- East, Mid-Ouachita, Social Hill, and Deceiper -- have been defined for the Middle Ouachita River region between A.D. 1100-1700 (Early 2002a, b, c, d; Early, ed., 1993).

In addition to the East Place vessels in the HSU Museum collections (Early 2002a; Weber 1972), there is a set of vessels excavated from East by Odis and Nell Sullivan in the 1950s to 1970s, recently donated to the Arkansas Archeological Survey (Morrow et al. 2014). Ann Early created a topographic map of the site in 1980, and she and Daniel Wolfman collected two samples for archaeomagnetic dating. The dates, EA 89-90, from baked clay structure floors within two mounds at East, returned dates of 1270±20 and 1400±25 (Wolfman 1982). This helped establish that the East phase was a Middle Caddo period manifestation. The site was used into the Late Caddo period as well. A future project will bring together available information from these different sources on East, and provide a clearer discussion of the history of site use.

Here, we present Vere Huddleston's manuscript describing his East Place excavations. The typed manuscript and several pages of an earlier handwritten version are in the HSU Archives (Hodges Collection, 41/04D 43-50, 41/04E 1-2). The manuscript, written about 1945, is accompanied with several pages of artifact sketches (Figures 3, 4, 5) that include Huddleston's vessels as well as those of Richardson, Proctor, Ritchie, Whaley, and Horton. For this article, we have edited lightly (corrected spelling, changed endnotes to in-text citations, and added several headings), deleted locational information to protect archaeological sites from further disturbance, and made several editors' notations. Our detailed discussion and documentation of Huddleston's East vessels follows the manuscript.

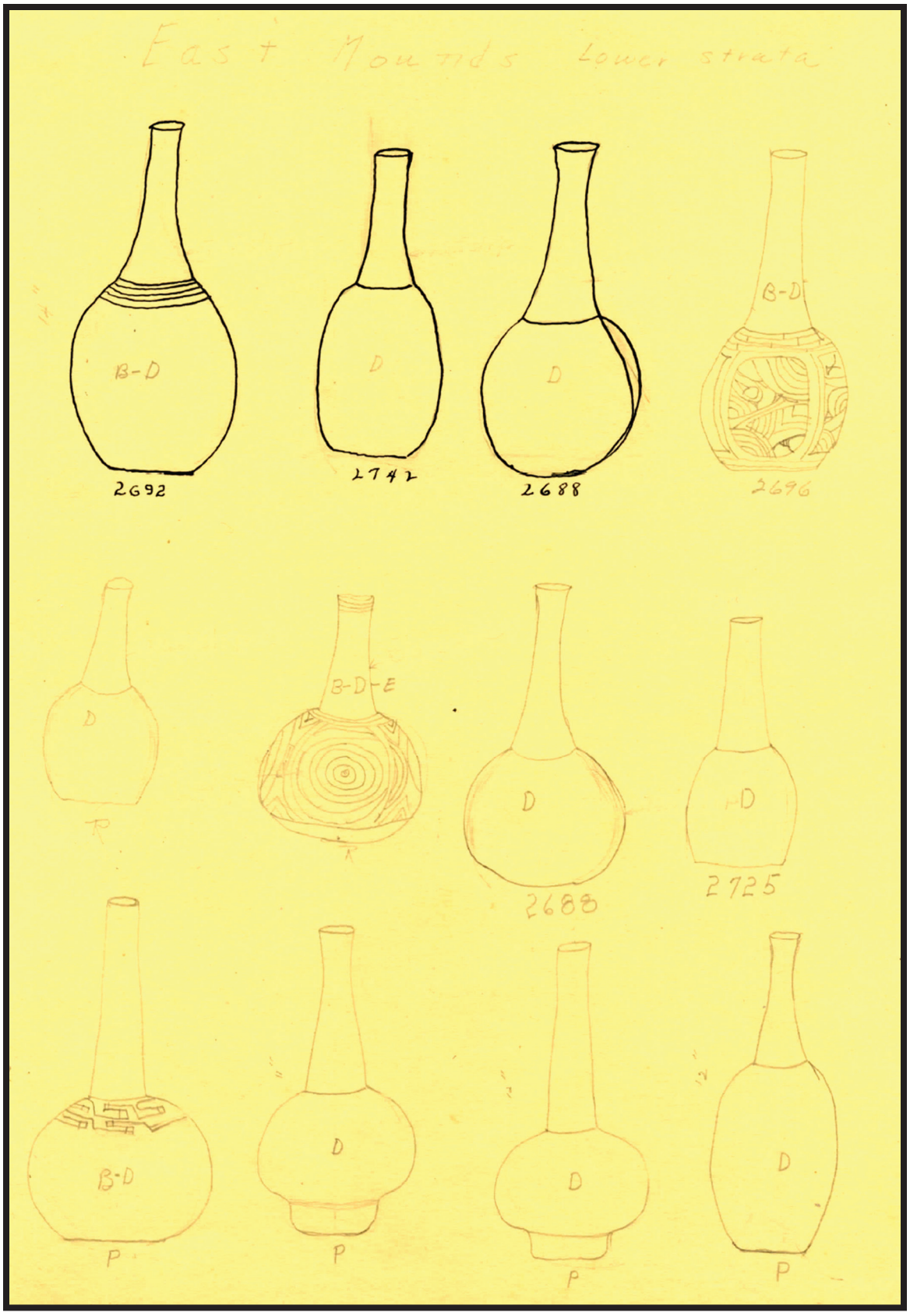

Figure 3. Huddleston's sketches of bottles from East Place (HSU Archives, Hodges Collection, 41/04D-62).

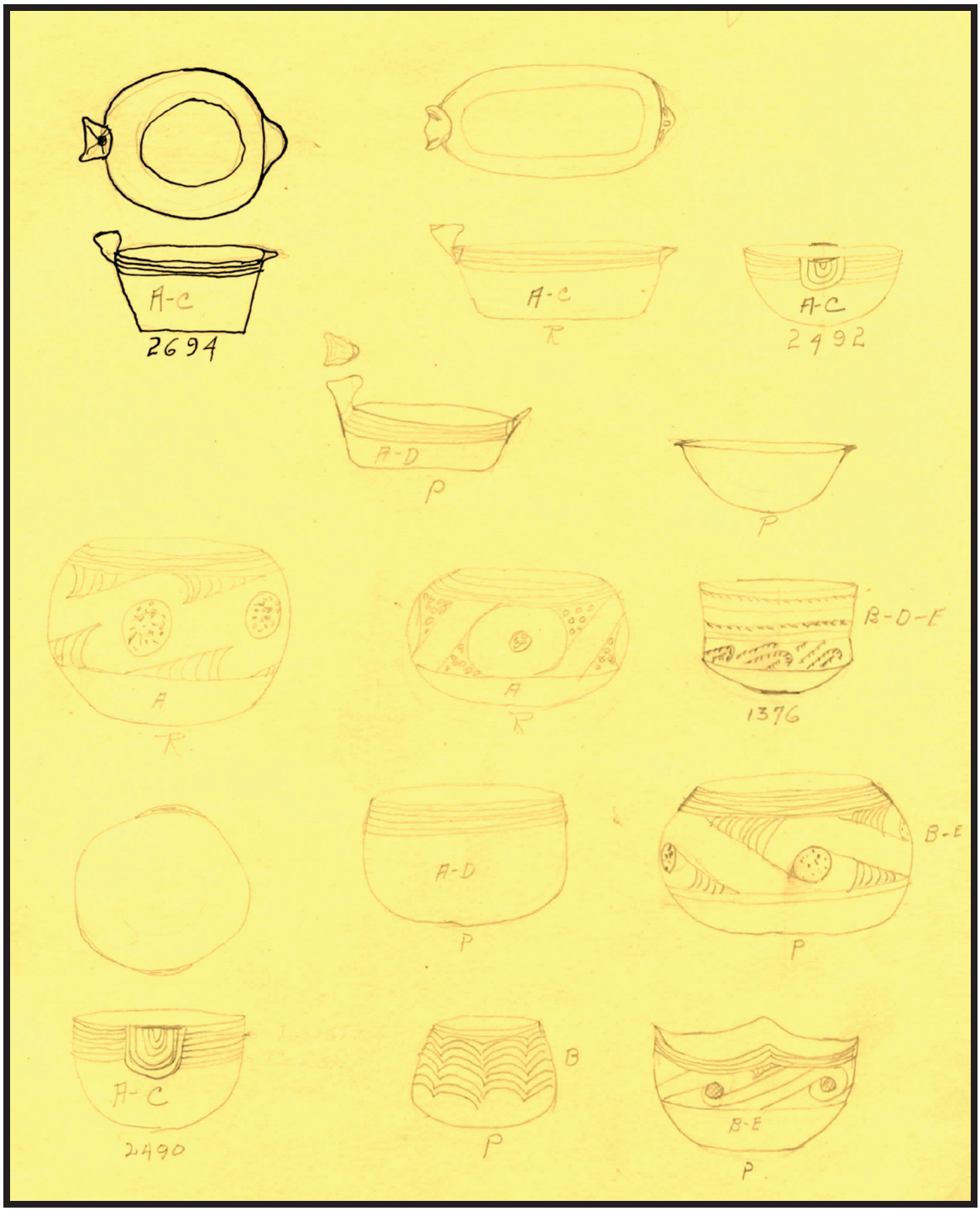

Figure 4. Huddleston's sketches of bowls from East Place (HSU Archives, Hodges Collection, 41/04D-40).

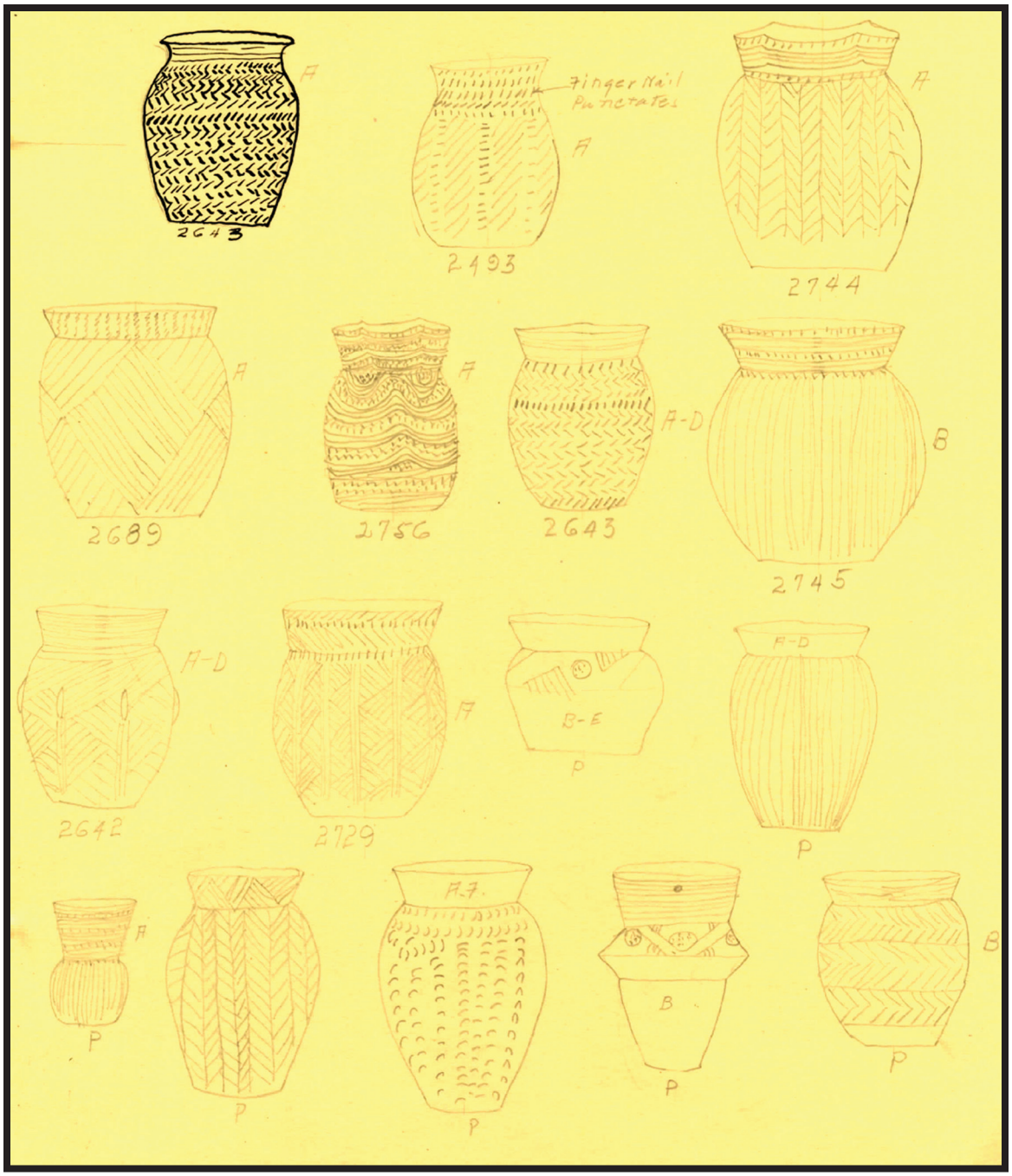

Figure 5. Huddleston's sketches of jars from East Place (HSU Archives, Hodges Collection, 41/04D-61).

Vere Huddleston's "Ancient Village Sites on Antoine River in Clark County, Arkansas"

There is in the western part of Clark County on the W. B. East farm on the Antoine River, a mound site which from all indications is very early Caddo. The name Pre-Columbian Caddo has been given to the culture the pottery indicates by C. H. Webb of Shreveport, Louisiana (personal conference April 10, 1945).

The site is part of a long series of mounds and village sites extending from above the present village of Antoine, on the Antoine River, to a point about five miles down the Antoine to its confluence with the Little Missouri, and some two miles down the Little Missouri. Most of the mounds are on the east or Clark County side of the river. One large mound is on Buren Hardin's farm …. [*Eds.*: locations deleted in this paragraph and next; descriptions indicate archaeological sites 3NE68, 3CL60, and 3CL29]. Sherds and stone artifacts picked up on this site indicate a possible Marksville culture.

About … miles above the East site is considerable evidence of a camp site area and a large conical mound approximately twenty feet high. About … miles below is the Kirkham site excavated by Lemley and Dickenson in 1932 (Dickinson and Lemley 1939).

Nowhere in the Ouachita Valley has the writer seen a mound site area similar to the East site. It is located ... on an old bank of the Antoine River …. The site covers between twenty and thirty acres and consists of fifteen mounds that are still quite noticeable and possible remnants of others that the river and the plow have long since obliterated. All but four are from a few inches to three or four feet in height. These four are much larger than the others and are arranged in a semicircle and connected by lower saddles or ramps. The tallest is about fifteen feet high, and is near the center of the semicircle.

The topography of the site and its size makes it likely to conclude that this is the Quipana mentioned in the travels of De Soto as narrated by the Gentleman of Elvas (Swanton 1939:230, 255). [*Eds.*: While the Swanton Commission placed Quipana on the Antoine or Little Missouri River, modern reconstructions of the De Soto route places both Tula and Quipana further north in the Ouachita Mountains (Early 1993). The Spanish may have passed through the Little Missouri region on their way west after visiting Chaguate in the Middle Ouachita River region, however (Girard et al. 2014; Schambach 1993).]

The first excavation known to the author was made in 1933 by Lemley and Dickinson (personal conference with S. D. Dickinson, 1943). This was merely a superficial visit and only one excavation was made in one of the connecting ramps. Nothing was found.

On April 29, 1939, the author in company with Dr. Otis Whaley and Dr. William Ritchie, both of the faculty of Henderson State Teachers College, visited the site and found on the south slope of a mound a burial area which yielded several graves ranging in depth from a few inches to thirty inches. There were in all about twenty graves in this group, some so close to the surface that the plow had wrecked the tops of the pottery. All the pottery, the stone and bone artifacts, and the two pipes recovered were of the typical Caddo ware so common to the Ouachita Valley area. Skeletal material was either completely deteriorated or so soft as to be beyond recovery with one exception; this was a very shallow grave at some

distance down the west slope of the mound and isolated from the other graves. The skull and some of the other bones were well preserved. With this burial were three Glendora bottles arranged around the head, two cone-shaped bowls near the right hand, and a broken food jar between the outstretched legs. Near the right elbow were three beautifully worked and polished bone awls. All the pots were crushed. [*Eds.*: Huddleston notes 7 graves (Table 1: Graves 1-7) that he dug in 1939; this description refers to his Grave 6, but neither the human remains nor the objects from this grave have been identified in the JEC Hodges Collection.]

All these graves were in black kitchen midden and had been buried in all directions with the majority facing east. There was a larger percentage of Glendora bottles than in any other typical Caddo site known to the author. Of some possible significance is the fact that no seed jars were found. Of the two pipes found one was of elbow pattern and the other a modified platform type, similar to the long stemmed pipes found later. The stem was four inches long and the projection of the stem beyond the bowl was pointed. Both types are common in typical Caddo burials. In all some eighty-five pieces of pottery were taken out but about three-fourths were badly crushed or wrecked by the plow. [*Eds.*: About 37 vessels were mentioned in Huddleston's notes from the 1939 excavations (Table 1), 15 of which have been identified in the JEC Hodges Collection. His figure of 85 pieces of pottery presumably also includes pots from graves dug by Whaley and Ritchie.]

About a year after excavation of the above described area we by accident discovered on top of the same mound, a grave thirty inches deep that yielded a type of pottery which we recognized immediately as something distinctly different from the typical Caddo pottery. [*Eds.*: This is Huddleston's Grave X, excavated 5/9/1941.]

The area in which the burials were found yielding this type of pottery covered roughly a spot about thirty feet square. The burials ranged in depth from two and one-half to seven feet. All were the same in that it was necessary to excavate through hard packed clay to reach them, and most of them were on a level of between six and seven feet deep.

There was only an occasional sherd or piece of charred wood to indicate the soil had ever been disturbed. All the burials were intrusions in a previously undisturbed clay seems to have been used [*Eds.*: Huddleston may have meant 'that seems to have been unused.'].

Occasionally a layer of ashes mixed with clay would be encountered. In all the deep graves there was a layer of silt deposit two inches thick and approximately thirty inches above the grave floor level. As it was uniform in thickness and about the same depth in all the burials it seems to indicate a break period in the construction and use of the mound as a burial site. In all, four burials were found above this silt deposit which contained the same type pottery. A total of twenty-four graves were excavated. In addition to the three people mentioned in the first of this paper as assisting in the excavation the following people also took part: Mr. R.T. Proctor, Mr. Charlie Richardson, Dr. P.G. Horton and Dr. Erwin. The twenty-four graves yielded on hundred and twenty pieces of pottery, six celts or fist hatchets, five crystals, five quivers of arrows containing a total of over one hundred points, one pair slate ear spools, one wood effigy wood duck head, five long stem pipes and one platform pipe, one piece of galena and several traces of copper artifacts. [*Eds.*: Huddleston's notes describe

about 11 graves dug by him between May 1941 and January 1943, with about 54 pottery vessels (Table 1); 30 of these vessels, along with 1 celt, 1 pipe, 2 quartz crystals, and the wooden duck head adorno (Figure 6) have been identified in the JEC Hodges Collection.] There was no skeletal material found in any of the graves except one which showed evidence of cremation, only the skull remained. In most of the graves not a trace of bone remained. Possible skeletal positions could be determined only by the position of artifacts.

Figure 6. Duck head effigy adornos, JEC Hodges Collection: left, carved wooden artifact from East Place, 77-1/1-11; right, ceramic effigy, no provenience, 77-1/X
(Arkansas Archeological Survey digital photograph AASHSUD_N8995).

Two burials contained portions of charred remains of what appeared to have been cane mats that had been placed over the body and burial furnishings. There are six other sites known in the Ouachita Valley where similar artifacts and burial conditions have been found – the Crenshaw site (Dickinson 1936), Haley Place (Moore 1912:527-564), Ozan (Harrington 1920), Gahagan mound site (Webb and Dodd 1939), and two other sites in Clark County from which similar pottery has been taken by the author. [*Eds.*: Crenshaw (3MI6), Haley (3MI1), and Gahagan (16RR1) are in the Red River valley in Arkansas and Louisiana while the sites near Ozan, including Ozan 1, 3HE37, and Washington, 3HE35, are between the Little River and Little Missouri River drainages in Arkansas. The Clark County sites he refers to may have been 3CL40 and 3CL84, based on several East Incised, Sinner Linear Punctated, and Smithport Plain vessels that have been documented in the JEC Hodges Collection.]

Pottery. The pottery is characterized by the following: a predominance of red ware or red slip ware; absence of seed jars; beaker type vessels with pierced rims; tall necked bottles which gradually enlarge from the top to the base; bottles with bases; no shell tempered ware; a good percentage of flat bottom pieces; few effigies (only three in all); and most of the decoration of rather simple lines or punctates. The decoration consisted of

both incised and engraved lines, punctates, raised or pinched designs, fingernail punctates, scalloped rims, and what appears to be an attempt to imitate stamped ware in at least two pieces. There were several semi-globular bowls similar to those described by Harrington (1920) from the Ozan site.

Two of these bowls were unique in that both engraving and incised lines were used in executing the motif. In both, the potter had incised the characteristic four to six lines around the rim on a slightly thickened incurving portion of the vessel, this portion being just as wide as the space used for the lines. After this incising the vessel had been given a red slip coat and engraved with circles and semi-interlocking scrolls, the motif covering almost the entire outside of the vessel. [*Eds.*: Based on the accompanying sketches, at least one of these is a Crockett Curvilinear Incised bowl collected by Ritchie.]

Of the three effigies found all were most alike and in the same grave. They were all small bowls, the largest being five inches in diameter, the other two were boat shaped. Each consisted of the head of what may have been meant for a fox attached to the rim and looking into the bowl. On the opposite side of the rim is a small projection resembling a tail. The decorative motif in each was the same, four to six incised lines on a slightly thickened portion of the rim. All had also been treated with a red slip coat. [*Eds.*: These vessels were described in Huddleston's notes as coming from his Grave B, with one going to Mr. Charlie [Richardson], one to Mr. Proctor, and one retained by Huddleston (and now in the JEC Hodges Collection, 77-1/1-14). One of the boat-shaped effigy bowls is illustrated in Suhm and Jelks (1962:Plate 21E) and in Newell and Krieger (1949:Fig. 63H), but is not in the HSU Museum Collection.]

The bottles are characterized by having necks that are as tall or taller than the body of the bottle. All the necks are smaller at the top than at the base, but in a few cases there is a flare at the top. The tallest bottle was fourteen inches. All were red slipped and most of them were plain. In the decorated bottles, the motif consisted of either engraved or incised lines around the top of the body of the bottle. The body of one is entirely decorated with incised parallel lines which extend from the base of the neck to the bottom of the bottle. The lines are about one-fourth inch apart and are heavy. Another bottle has four broken engraved lines circling the top of the body and the remainder of the body divided into four sections each surrounded with two concentric circles. Within the circles there are interlocking angular lines and semicircles with no apparent motif.

There were a number of beaker shaped jars or bowls having all most perpendicular sides with flat bottoms. About three-fourths of them were decorated and always in the same manner; four to six lines around the top on a slightly thickened portion of the rims. All of these beakers were treated with a red slip and have pierced rims for suspending. Harrington (1920:Plate LXIX-LXXX) shows similar forms from the Washington site. Lines are overhanging as in the Coles Creek Culture (Ford 1936:172-218). Five similar pieces were semi-globular in shape but in ware, decoration, and piercing of the rims, were the same.

The vase forms ranged in size from three inches tall to ten inches. All were incised using as motifs alternate meandering lines and punctates, herringbone motifs, or parallel lines. The body of one is completely covered with small punctates arranged in rows parallel

to the base. [*Eds.*: Sentence missing? Discussion shifts from jars to East Incised bowls.] They ranged in diameter from four to eight inches and all but one were decorated with a rich red slip and parallel lines around the rim on a thickened wall. These bowls have two rim projections opposite each other which consists of a flattened top wide enough to permit the incising of a circle with a triangle on each side and a shrinking of the outside of the rim just under this flat top. In incising seven of the slip pieces the slip was applied often by pipe. [*Eds.*: Meaning unclear.]

Pipes. All the pipes found were similar with one exception. Harrington (1920:Plate CIV) found one similar to this from the Hot Springs site. [*Eds.*: Harrington visited several sites in the Upper Ouachita River drainage near Hot Springs, Arkansas.] Five of the long stem type were found; the shortest was five inches and the longest twenty three inches. These pipes are very delicate and the bowl is very small. They were probably for ceremonial purposes only. All had been treated with a red slip and showed evidence of use. Harrington (1920) and Lemley [*Eds.*: either refers to Dickinson and Lemley 1939 or Lemley 1936] and Moore (1912) found similar types. All the pipes had apparently been stood against the wall of the grave near the head. One had either fallen into or had been placed in a bowl.

Arrowpoints. In all, seven graves yielded caches of arrows ranging in number from nine to thirty eight. In every case they were pointing in the same direction. All points were very expertly and delicately chipped of red, brown, gray, and white flint and novaculite and ranged in length from one-half to two and one-half inches. Similar types have been found at Gahagan (Webb and Dodd 1939), Haley Place (Moore 1912), Crenshaw site [*Eds.*: either refers to Dickinson 1936 or Lemley 1936], and Mineral Springs (Harrington 1920). In one small beaker with pierced rim there were ten small arrows. [*Eds.*: While Huddleston's notes indicate caches of arrowpoints were found in Graves B, C, F, and G, none have specifically been identified in the JEC Hodges Collection. Similar caches of arrowpoints or quivers of arrows have been described from deep graves at several of these other sites (as well as at Cahokia's Mound 72, later in the 20th century [Fowler et al. 1999]).]

Copper. Traces of copper were found in four graves. In no case was there enough left to indicate its usage other than a part of clothing. Under one piece there were two short pieces of twisted cord possibly part of a robe. There were two semi-spherical objects which appeared to be halves of nuts that had been covered with copper. [*Eds.*: Huddleston's notes indicate two copper-covered objects in Graves D and E, not identified in JEC Hodges Collection.]

Polished Stone. Six graves yielded beautifully polished celts which apparently had been placed near the hand of the body but bone was so completely gone as to make this only a guess. In four graves there were large crystals placed in about the same position; these ranged in length from five to nine inches and were from three-fourths to one and one-fourth inches in diameter. There was one pair of round slate ear spools three and one-half inches in diameter. Both showed evidence of having been copper covered.

Skeletal Material. Evidences of skeletons were observed in only one grave. This appeared to be a cremation. Only the skull remained so that it could be preserved. A

considerable amount of ash and charcoal was packed on the grave floor and around the bones and artifacts. The skull was badly crushed. [*Eds.*: Huddleston's notes indicate a crushed vessel and skull in ash were found in Grave A; the skull was given a catalog number, but has not been linked with human remains in the JEC Collection. The human remains tentatively identified from East in the collection were found in vessel 1-40 with no further information (Table 1).]

Other Materials. A piece of galena was found in one grave. It was about the size of a walnut and unworked except for a hole pierced through the thin side. One wood ornament was found. [*Eds.*: This wood artifact (77-1/1-11, Figure 6) was apparently found by Dr. Richie in 1942.] It had been burned and was about the consistency of charcoal which would account for its preservation. It is probably walnut and was carved to represent a wood duck head. Lines across the top and on the sides had been filled with yellow red and white ocher. There was a projection from the underneath side suggesting a neck which was probably the means of fastening it to a hollow cane or stick.

Summary. Contrasts with the usual Caddo burials of the surrounding area:

a. Most of the pottery is either red slip or red ware.
b. All tempering is either sand or grit, no shell.
c. Tall necked bottles with tapering sides from top to base.
d. Large crystals in burials.
e. Arrows are excellently chipped and shaped considerably different from those found on Caddo sites or graves.
f. Pipe stems are long and delicately made with the portion of the stem extending beyond the bowl cut square off. In Caddo burials where similar pipes have been found the stems are larger and extend to a point beyond the bowl.
g. Copper covered ear spools and other copper covered objects.
h. Beaker shaped vessels with pierced rims.
i. Caho Ka type arrow points. [*Eds.*: Huddleston footnotes "Cahoaka" but does not provide a reference on the Cahokia site.]
j. Parallel lines around rim of vessels similar to Coles Creek (Ford 1936).
k. Mound arrangement not typically Caddo.
l. No seed jars or cazuellas.

Editors' Discussion: Documentation of Huddleston's East Vessels

A total of 45 of Huddleston's vessels from East Place (3CL21) have been identified in the JEC Hodges Collection (the Hodges Collection was accessioned as 77-1, each site was coded with a number, such as 1 for 3CL21, and each artifact identified to 3CL21 was assigned a unique number, -1, -2, -3; see Appendix). These have been documented using a protocol first developed by Ann Early for use on the HSU Museum vessel collections and recently revised by Early and Leslie Walker (2014) as part of the Arkansas Archeological Survey's digital vessel database initiative. The record form includes attributes of form and shape, paste and temper, measurements, decorative treatment, evidence of use, and associations. The East Place vessels were documented between 1999 and 2014 at the Arkansas Archeological Survey's HSU Research Station, first under Ann Early's and then under Mary Beth Trubitt's supervision. While there have been some changes in the recording protocol during this time (for example, "grit" often referred to "claygrit" or grog rather than crushed rock temper in earlier years), the results are comparable. Decorative treatments to vessel rim and

body use the collegiate or descriptive system, developed for use on Caddo vessels in southern Arkansas (e.g., Early, ed., 1993; Schambach and Miller 1984), that uses named patterns and numbered design variations within each pattern. Some of the East vessels represent "type examples" for specific design variations (Figure 7). Type and variety names follow Early (ed., 1993) and Suhm and Jelks (1962). While black and white photographs were taken in 1977-1978, documentation of vessels in the JEC Hodges Collection at the Arkansas Archeological Survey's HSU Research Station since 1999 has also included color slides and digital photographs. Site collections that include Huddleston vessels and records have been prioritized, with an effort made to identify associated funerary objects that can be linked with human remains in the JEC Hodges Collection (Trubitt 2012b).

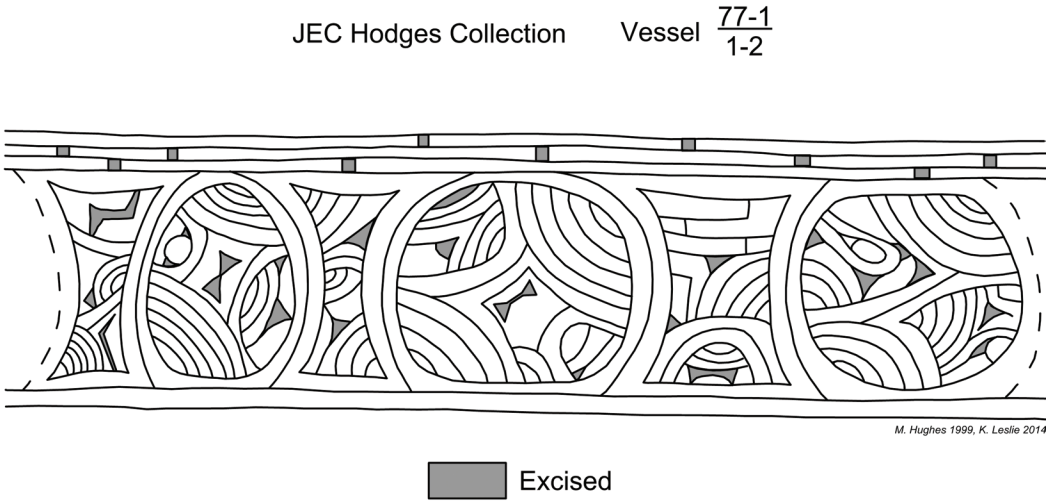

Figure 7. Illustration of new Evangel 1 pattern and design from engraved bottle 77-1/1-2, Huddleston's Grave B (roll-out drawing by Milton Hughes and Katie Leslie, Arkansas Archeological Survey, 1999 and 2014).

The JEC's Hodges Collection contains about 55,000 objects, most of which are stone tools and broken pottery pieces. The collection also includes about 1300 whole, partial, or reconstructed vessels (Early 1978). JEC Hodges Collection artifacts were first exhibited at the HSU Museum in 1981; displays on the campuses of Henderson State University and Ouachita Baptist University began in 1996, and there are currently four venues with exhibits from this collection in Arkadelphia. Following the passage of the Native American Graves Protection and Repatriation Act or NAGPRA in 1990, inventories and notifications were done for HSU Museum and Arkansas Archeological Survey collections. The Joint Educational Consortium, made up of Henderson State University and Ouachita Baptist University (and the Ross Foundation at one time), initially maintained that their collection was outside the scope of NAGPRA, but did send a summary to the Caddo Nation in 1995. More recently, JEC officials have consulted with and met with representatives of the Caddo Nation about the collection.

Based on his notes, Vere Huddleston dug graves at East Place (3CL21) between April, 1939, and January, 1943. In 1939, Huddleston dug 7 graves that included pottery styles that he had previously seen on other sites in the Middle Ouachita River region (Table 1, Graves 1-7). Fifteen vessels from these graves have been identified in the JEC Hodges Collection. Shell and grog-and-shell temper predominates in vessels in the four grave lots represented. Vessel shapes (carinated bowls described as cone-shaped by Huddleston, bottles with short spool necks and everted lips, sometimes pedestalled), and types (Means Engraved, Keno Trailed *variety Red Hill*) indicate late Social Hill or Deceiper phase assignment (Early 2002c, d; Early, ed., 1993) for Huddleston's Grave 1/2, 3, and 7 (Figure 8). There are similarities with Middle Ouachita River sites such as Hardman (Early, ed., 1993). One grave lot (Huddleston's Grave 4, with a brushed/punctated jar, a carinated

Glassell Engraved bowl, and two notched rim bowls similar to Hardman Engraved but plain) probably dates to the late Mid-Ouachita or Social Hill phase (Early, ed., 1993). Bottles (n=4) and carinated bowls (n=6, of 15) are the most common vessel form in this set, but there are vessels from these graves that are missing (possibly in HSU Museum Collections).

Figure 8. JEC Hodges Collection vessels linked to Huddleston's Grave 3, excavated from East Place in 1939 (Arkansas Archeological Survey digital photographs).

Between May of 1941 and January of 1943, Huddleston dug 11 graves at East, several of which were in a mound or mounds, sometimes deep (4-6' below surface) but occasionally shallow (18"). Huddleston recognized that the artifacts represented a different and earlier time period in the site's occupational history. Thirty vessels from this group have been identified in the JEC Hodges Collection, as well as 1 celt, 1 pipe, and 2 quartz crystals. The vessels are predominantly tempered with grog and include tall plain or red-slipped Smithport Plain, Hickory Fine Engraved, and Spiro Engraved bottles, East Incised bowls and beakers, and jars with rectilinear incising and punctating typed as Pease Brushed-Incised (Figure 9, 10). Most of these grave lots indicate an East phase component at the site (Early 2002a; Early, ed., 1993), or early Mid-Ouachita phase (grog-tempered Military Road Incised, Adair Engraved). Jars (n=11), bottles (n=8), and beakers (n=7, of 30) are the most common vessel form of this set, but again, all the vessels from these graves are not present in the JEC Hodges Collection.

Figure 9. JEC Hodges Collection vessels linked to Huddleston's Grave B, excavated from East Place in 1942 (Arkansas Archeological Survey digital photographs).

One small jar (77-1/1-40) had no provenience or context information other than site. It is tempered with grog and grit (abundant mica), and plain, with red color from firing or possible red ochre rather than an applied slip. The shape is unusual for this region, and its assignment to 3CL21 may be in error. Human bone fragments were found in the jar that may have come from the same grave, but there is no identification or notes, so the context is unclear. The vessel and the human remains are interpreted as associated at this time. No other human remains in the JEC Hodges Collection have been identified or linked to East Place (3CL21).

There are similarities between the East phase burial vessels from East and vessels at Crenshaw (3MI6) in the Red River valley, as noted by Huddleston in his manuscript. Early Caddo vessels documented from Crenshaw by Perttula and colleagues (2014) also included East Incised, Hickory Engraved, Smithport Plain, and Spiro Engraved types, but that assemblage also included numerous Crockett Curvilinear Incised and Haley Complicated Incised vessels, not documented in this collection from East (although Huddleston's sketches show several examples in Proctor's collection from the site). Pease Brushed-Incised vessels were assigned to Middle Caddo contexts at Crenshaw (Perttula et al. 2014). Hickory Engraved bottles and Pease Brushed-Incised jars are also well represented in the assemblage excavated by Harrington from the Ozan sites and Washington, although Hempstead Engraved, Crockett Curvilinear Incised, Sinner Linear Punctated, and Haley Complicated Incised are found there and not in this East collection (Gonzalez et al. 2005; Harrington 1920). Hays Mound (3CL6), in the Little Missouri River valley, was salvaged as it was being leveled in 1971 (Weber 1973). With dates ranging between A.D. 1000-1400 and a sherd assemblage that includes many types and surface treatments seen at East, Hays is an important comparison but needs an updated artifact

Figure 10. JEC Hodges Collection vessels linked to Huddleston's Grave F, excavated from East Place in 1943 (Arkansas Archeological Survey digital photographs).

analysis (Early 2002a; Trubitt 2009; Weber 1973). Excavations at 3CL401 (Ross), a mound site in the Little Missouri River valley, produced sherds of similar pottery (Early 1984). From the Middle Ouachita River valley, comparisons can be made with lower levels excavated at 3CL27 (Bayou Sel) and the lower structure and premound midden at 3CL593 (Caddo Valley Mound) (Trubitt 2009).

Huddleston's work at East Place (3CL21) has played an important role in the history of Caddo archaeology. Many of the vessels he and the other Arkadelphia amateur archaeologists dug from graves at the site in the 1930s-1940s were used to illustrate and later define the initial Caddo presence in the Middle Ouachita River region in Arkansas, now defined as the East phase, ca. 1100-1400 A.D. Based on the vessels and reconstructed Huddleston grave lots, it is clear that the use of the site extended to the Deceiper phase, ca. 1650-1700 A.D. The manuscript that Huddleston wrote, reproduced here, provides some context for the artifacts.

Acknowledgements

Original Huddleston and Hodges notes are curated at HSU Archives, and the JEC Hodges Collection artifacts are curated at Henderson State University in Arkadelphia, Arkansas. The East Place vessels were documented between 1999 and 2014 at the Arkansas Archeological Survey's HSU Research Station by Florence Davis, Mary Ann Goodman, Ann Early, Jeffrey Gaskin, Vanessa Hanvey, Jim Hudgins, Milton Hughes, Judy Thye, Mary Beth Trubitt, and Kate Wright. JEC Hodges Collection documentation has been funded in part by a 2006 grant from the Ross Foundation. We appreciate comments on an earlier version of this manuscript by Ann M. Early, as well as suggestions by the two reviewers prior to publication.

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Revisiting a Historic Manuscript:

Vere Huddleston's Report on East Place (3CL21) Excavations

Edited by

Mary Beth Trubitt (Arkansas Archeological Survey) and

Linda Evans (Henderson State University)

APPENDIX:

EAST PLACE VESSEL DOCUMENTATION

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-1, 2491
Vessel Form	bowl, simple
AAS/HSU Digital Photo No.	1773
Type	East Incised
Decoration	red slipped/incised
Rim :: Body	Barrington 9 (type) :: plain
Paste	SOFT, SLIGHTLY CRUMBLY
Temper	GROG & GRIT
Color, Core	GRAY
Color, Exterior	RED
Color, Interior	STRONG BROWN
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRECLOUD ON BASE; SOME SURFACE SCRATCHING ON INSIDE BOWL BOTTOM (RECENT?)
Shape / Description	ROUND, SHORT; DIRECT RIM FROM ROUND, CONVEX BASE TO LIP
Lip Treatment	ROUNDED, NO ANGLE
Orifice Diameter cm	14.4
Rim Height cm	7.5
Rim Thickness cm	.4
Rim Surface Treatment	SMOOTHED & SLIPPED & INCISED
Rim Decorative Treatment	RED SLIP, 6 HORIZONTAL 2MM-WIDE INCISED LINES SPACED 4 CM APART; 4 NESTED U-SHAPED INCISED LINES UNDER RIM TAB
Rim/Neck Shape	STRAIGHT, VERTICAL/DIRECT
Body Maximum Diameter cm	
Body Height cm	
Body Thickness cm	
Body Surface Treatment	
Body Decorative Treatment	
Body Shape	CONVEX
Base Shape	CIRCULAR, CONVEX
Base Diameter cm	7.5
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	HANDLES, 2 TABS AT RIM, INCISED ON TOP
Notes	Huddleston Grave X, 5/9/1941 (with 1-5, 1-9, 1-28), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-2, 2696
Vessel Form	bottle
AAS/HSU Digital Photo No.	1783
Type	Spiro Engraved?
Decoration	red slipped/engraved
Rim :: Body	plain :: Evangel 1
Paste	HARD, FINE, COMPACT
Temper	GROG & GRIT
Color, Core	REDDISH
Color, Exterior	STRONG REDDISH BROWN, TAN, LIGHT GRAY
Color, Interior	
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRECLOUDS, RED SLIP WORN OFF IN PLACES, BOTTOM ROUGH
Shape / Description	LONG NECK BOTTLE W/ FLAT, ROUND BASE, GLOBULAR BODY
Lip Treatment	ROUNDED, SLIGHTLY EVERTED
Orifice Diameter cm	4.2
Rim Height cm	15.5
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED & SLIPPED
Rim Decorative Treatment	RED SLIPPED
Rim/Neck Shape	INSLOPING, LONG NECKED
Body Maximum Diameter cm	13.2
Body Height cm	10.6
Body Thickness cm	
Body Surface Treatment	SMOOTHED & SLIPPED & ENGRAVED
Body Decorative Treatment	CURVILINEAR ENGRAVING/EXCISING, 3 CIRCULAR PANELS
Body Shape	GLOBULAR
Base Shape	CIRCULAR, FLAT
Base Diameter cm	9.9
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave B, 11/21/1942 (with 1-3, 1-14), East phase; previous illustration Newell & Krieger 1949: Fig. 65A

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-3, 2695
Vessel Form	beaker
AAS/HSU Digital Photo No.	1769
Type	East Incised
Decoration	incised
Rim :: Body	Bates 16 (type) :: plain
Paste	HARD, FINE, SILTY, COMPACT
Temper	GROG & GRIT
Color, Core	LIGHT GRAY
Color, Exterior	DARK GRAYISH BROWN, VERY PALE BROWN
Color, Interior	VERY DARK GRAY
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRECLOUDS
Shape / Description	SMALL BEAKER - SMALL DIA. ROUND BASE, RIM SLANTS UP & OUT W/ INSLANTED LIP
Lip Treatment	ROUNDED
Orifice Diameter cm	6.9
Rim Height cm	8.4
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED & BURNISHED & INCISED
Rim Decorative Treatment	HORIZ. INCISED LINES W/ RED PIGMENT - 4 LINES TOP (.5 CM SPACING), 5 LINES LOWER BODY (3CM SPACING)
Rim/Neck Shape	CONVEX, INSLANTED
Body Maximum Diameter cm	7.5
Body Height cm	
Body Thickness cm	
Body Surface Treatment	
Body Decorative Treatment	
Body Shape	OVOID
Base Shape	CIRCULAR, FLAT
Base Diameter cm	4.9
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	2 SUSPENSION HOLES
Notes	Huddleston Grave B, 11/21/1942 (with 1-3, 1-14), East phase; previous illustration Newell & Krieger 1949: Fig. 65C; Suhm & Jelks 1962: Plate 21L

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-4, 2689
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	1765
Type	Pease Brushed-Incised or Dunkin Incised ?
Decoration	incised/punctated
Rim :: Body	Caldwell 15 :: Antioch 14 (type)
Paste	SOFT
Temper	GROG & GRIT
Color, Core	REDDISH YELLOW
Color, Exterior	PINKISH GRAY, REDDISH YELLOW, VERY PALE BROWN
Color, Interior	DARK BROWN, PALE BROWN
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRECLOUDS
Shape / Description	SQUAT, GLOBULAR JAR W/ TALL FLARING RIM, ROUND BASE, SLIGHTLY OVAL FROM TOP
Lip Treatment	ROUNDED
Orifice Diameter cm	13.1
Rim Height cm	3.2
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED & PUNCTATED
Rim Decorative Treatment	COLUMNS OF VERTICALLY ARRANGED PUNCTATES, EACH 6MM X 1.5 MM
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	13.3
Body Height cm	10.7
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED & INCISED
Body Decorative Treatment	DIAGONALLY ARRANGED INCISED LINES FORMING TRIANGLES & DIAMONDS
Body Shape	GLOBULAR, NARROWING TOWARDS BASE, SHARP CURVE TO RIM
Base Shape	CIRCULAR, FLAT
Base Diameter cm	9.1
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave A', 11/14/1942 (with 1-19, 1-30, 1-31, 1-46?), East phase; previous illustration Newell & Krieger 1949: Fig. 65J

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-5, 2492
Vessel Form	beaker
AAS/HSU Digital Photo No.	1764
Type	
Decoration	plain
Rim :: Body	:: plain
Paste	MEDIUM, SILTY
Temper	GROG & GRIT
Color, Core	GRAY, PINK
Color, Exterior	DARK GRAY, PALE BROWN
Color, Interior	BROWN, REDDISH BROWN
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRECLOUDS
Shape / Description	BADLY BROKEN, CYLINDRICAL
Lip Treatment	
Orifice Diameter cm	
Rim Height cm	
Rim Thickness cm	
Rim Surface Treatment	
Rim Decorative Treatment	
Rim/Neck Shape	
Body Maximum Diameter cm	9.9
Body Height cm	
Body Thickness cm	.6
Body Surface Treatment	SMOOTHED & BURNISHED
Body Decorative Treatment	
Body Shape	CYLINDRICAL
Base Shape	CIRCULAR, CONVEX
Base Diameter cm	8.5
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave X, 5/9/1941 (with 1-1, 1-9, 1-28), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-6, 2757
Vessel Form	beaker
AAS/HSU Digital Photo No.	1768
Type	East Incised ?
Decoration	engraved
Rim :: Body	Eckerd 2 (type) :: plain
Paste	HARD, COMPACT
Temper	GROG & GRIT
Color, Core	GRAY
Color, Exterior	VERY DARK GRAY, VERY DARK GRAYISH BROWN
Color, Interior	DARK GRAY
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	EXTERIOR SURFACE SHOWS SLIGHT UNDULATIONS FROM SMOOTHING STONE
Shape / Description	SQUAT BEAKER, RIM SLANTS IN DIRECTLY FROM BASE
Lip Treatment	ROUNDED, DIRECT
Orifice Diameter cm	7.6
Rim Height cm	7.7
Rim Thickness cm	.6
Rim Surface Treatment	BURNISHED & ENGRAVED
Rim Decorative Treatment	7 LAZY IRREG ENGRAVED LINES, HORIZ, SPACED 1.5-6.5MM
Rim/Neck Shape	CONVEX, INSLANTED
Body Maximum Diameter cm	10.1
Body Height cm	
Body Thickness cm	
Body Surface Treatment	
Body Decorative Treatment	
Body Shape	CONCAVE, ELONGATED
Base Shape	CIRCULAR & FLAT
Base Diameter cm	8.6
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	2 SUSPENSION HOLES
Notes	Huddleston Grave G, 1/16/1943 (with 1-37), East to Mid-Ouachita phase; previous illustration Newell & Krieger 1949: Fig. 65B; Suhm & Jelks 1962: Plate 21K

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-7, 2725
Vessel Form	bottle
AAS/HSU Digital Photo No.	1787
Type	Smithport Plain ?
Decoration	red slipped?
Rim :: Body	plain :: plain
Paste	SOFT, SILTY, COMPACT
Temper	GROG & GRIT
Color, Core	LIGHT GRAY
Color, Exterior	LIGHT RED, LIGHT YELLOWISH BROWN, BROWN
Color, Interior	LIGHT BROWN, LIGHT YELLOWISH RED
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	HEAVILY MENDED BOTTLE, FIRECLOUDS
Shape / Description	GLOBULAR, TALL-NECKED BOTTLE W/ FLAT, ROUND BASE, BODY SQUAT GLOBE, RIM SLIGHTLY FLARED
Lip Treatment	ROUNDED, DIRECT
Orifice Diameter cm	
Rim Height cm	11.2
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED & SLIPPED
Rim Decorative Treatment	RED SLIPPED?
Rim/Neck Shape	CARAFE, LONG NECKED
Body Maximum Diameter cm	10.3
Body Height cm	9.9
Body Thickness cm	.4
Body Surface Treatment	SMOOTHED & SLIPPED
Body Decorative Treatment	RED SLIPPED?
Body Shape	OVOID
Base Shape	CIRCULAR, FLAT
Base Diameter cm	9.1
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave D, 12/13/1942 (with 1-17), East phase; Huddleston cat. card, “Coles Creek ware”

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-8, 2745
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	1781
Type	Pease Brushed-Incised or Karnack Brushed-Incised
Decoration	incised/punctated
Rim :: Body	Case 8 (type) :: Claflin 8 (type)
Paste	SOFT, CRUMBLY
Temper	GROG
Color, Core	LIGHT GRAY
Color, Exterior	REDDISH YELLOW, GRAY, VERY PALE BROWN
Color, Interior	DARK BROWN
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	BADLY BROKEN, HEAVILY MENDED
Shape / Description	GLOBULAR, TALL-RIMMED JAR
Lip Treatment	ROUNDED, SLIGHTLY EVERTED
Orifice Diameter cm	16.1
Rim Height cm	4.3
Rim Thickness cm	.7
Rim Surface Treatment	SMOOTHED & INCISED & PUNCTATED
Rim Decorative Treatment	PUNCTATIONS/INCISING, FROM LIP DOWN HAS 1 ROW PUNCTATES, 6 INCISED LINES, 1ROW PUNCT, 5 INCIS LINES, DISCONTINUOUS
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	15.8
Body Height cm	13.5
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED & INCISED & PUNCTATED
Body Decorative Treatment	ROW PUNCTATES AT SOULDER & VERTICAL INCISING
Body Shape	SUB-GLOBULAR
Base Shape	CIRCULAR, FLAT
Base Diameter cm	9.9
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	RIM TABS, 2 OPPOSABLE (RIM PEAKS?)
Notes	Huddleston Grave F, 1/1/1943 (with 1-24, 1-29, 1-43, 1-44?); previous illustration Newell & Krieger 1949: Fig. 65L; Suhm & Jelks 1962: Plate 60G

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-9, 2490
Vessel Form	bowl, simple
AAS/HSU Digital Photo No.	1777
Type	East Incised
Decoration	red slipped/incised
Rim :: Body	Barrington 10 :: plain
Paste	SOFT, CRUMBLY
Temper	GRIT
Color, Core	VERY DARK GRAY
Color, Exterior	RED-SLIPPED
Color, Interior	RED-SLIPPED
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	HIGH AMOUNT OF ABRASION ON BOTTOM OF VESSEL WHICH PERSISTS UP VESSEL FOR 3CM, RED SLIP HAS WORN AWAY IN PLACES. SOME ABRASION ON INSIDE OF VESSEL
Shape / Description	BOWL WITH INCISED (TRAILED-4.28MM WIDE) RIM TABS
Lip Treatment	FLATTENED, NO ANGLE/DIRECT
Orifice Diameter cm	15.5
Rim Height cm	8.3
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	7 HORIZONTAL INCISED LINES ON 1/2 OF VESSEL, 8 HORIZONTAL LINES ON OTHER 1/2; 2 5-LINE INCISED FESTOONS UNDER RIM TAB, RED SLIP
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	15.0
Body Height cm	
Body Thickness cm	
Body Surface Treatment	
Body Decorative Treatment	
Body Shape	CONICAL
Base Shape	CIRCULAR, CONVEX
Base Diameter cm	9.9
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	TAB HANDLES AT RIM, INCISED AREA ON TOP OF TAB
Notes	Huddleston Grave X, 5/9/1941 (with 1-1, 1-5, 1-28), East phase; previous illustration Newell & Krieger 1949: Fig. 65K; Suhm & Jelks 1962: Plate 21A

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-10
Vessel Form	jar, short rim
AAS/HSU Digital Photo No.	1762
Type	Karnack Brushed-Incised ?
Decoration	incised
Rim :: Body	plain :: Antioch 3
Paste	HARD
Temper	GROG & GRIT
Color, Core	LIGHT RED
Color, Exterior	BLACK, VERY PALE BROWN, LIGHT RED
Color, Interior	DARK GRAY, LIGHT YELLOWISH BROWN
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRECLOUDS
Shape / Description	JAR W/ SHORT, FLARING RIM
Lip Treatment	ROUNDED
Orifice Diameter cm	14.0
Rim Height cm	2.6
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED & BURNISHED
Rim Decorative Treatment	
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	13.6
Body Height cm	13.7
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED & BURNISHED & INCISED
Body Decorative Treatment	VERTICAL INCISING, NOT VERY REGULAR, LINES DO NOT CONTINUE TO BASE
Body Shape	HIGH-WAISTED, ELONGATED
Base Shape	CIRCULAR, FLAT
Base Diameter cm	7.9
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston, 9/1942 (labeled “East Sept. 42” on base); previous illustration Suhm & Jelks 1962: Plate 80M

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-12, 1368 (Huddleston 200)
Vessel Form	bottle
AAS/HSU Digital Photo No.	1791
Type	Keno Trailed *var. Red Hill*
Decoration	Incised/trailed
Rim :: Body	plain :: Belhaven 31 (type)
Paste	SOFT
Temper	SHELL (LEACHED)
Color, Core	GRAY
Color, Exterior	VERY DARK GRAY
Color, Interior	DARK GRAY
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	PROBE HOLE AT SHOULDER, OVAL 3X4MM
Shape / Description	SMALL, SQUAT GLOBULAR BOTTLE W/ CYLINDRICAL NECK, FLARED LIP, ROUND CONCAVE BASE
Lip Treatment	ROUNDED, FLARED
Orifice Diameter cm	4.5
Rim Height cm	6.1
Rim Thickness cm	.4
Rim Surface Treatment	SMOOTHED & BURNISHED
Rim Decorative Treatment	
Rim/Neck Shape	SPOOL
Body Maximum Diameter cm	10.5
Body Height cm	8.0
Body Thickness cm	
Body Surface Treatment	SMOOTHED & INCISED
Body Decorative Treatment	INCISING
Body Shape	SUB-GLOBULAR
Base Shape	CIRCULAR, CONCAVE
Base Diameter cm	4.7
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 1 or 2, 4/29/1939 (with 1-36, 1-48, 1-49), late Social Hill to Deceiper phase; Huddleston sketch in notebook; Phillips photo 3868

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-13, 1371 (Huddleston 207)
Vessel Form	Bottle, pedestalled
AAS/HSU Digital Photo No.	1798
Type	Keno Trailed
Decoration	Incised/trailed
Rim :: Body	plain :: Belhaven 32 (type)
Paste	HARD, COMPACT
Temper	GROG & GRIT
Color, Core	
Color, Exterior	DARK GRAY FIRECLOUDS, WHITE, VERY PALE BROWN
Color, Interior	VERY PALE BROWN
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRE CLOUDS
Shape / Description	SQUAT, PEDESTALLED BOTTLE WITH SHORT CYLINDRICAL NECK, FLARING RIM, 3 NODES IN PEDESTAL
Lip Treatment	FLATTENED, EVERTED
Orifice Diameter cm	5.4
Rim Height cm	5.7
Rim Thickness cm	.2
Rim Surface Treatment	SMOOTHED & BURNISHED
Rim Decorative Treatment	
Rim/Neck Shape	SPOOL, INSLOPING
Body Maximum Diameter cm	14.7
Body Height cm	7.3
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED & BURNISHED
Body Decorative Treatment	TRAILING
Body Shape	SUB-GLOBULAR
Base Shape	CIRCULAR, FLAT, PEDESTAL
Base Diameter cm	6.2
Base Height cm	2.3
Base Surface Treatment	
Base Decorative Treatment	
Appendages	PEDESTAL-OUTSLANTING CYLINDRICAL WITH 3 NODES
Notes	Huddleston Grave 3, 4/29-5/5/1939 (with 1-32, 1-34, 1-41?, 1-50), late Social Hill to Deceiper phase; Huddleston sketch in notebook; Phillips photo 3858

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-14, 2694
Vessel Form	effigy bowl
AAS/HSU Digital Photo No.	1201
Type	East Incised
Decoration	red slipped/incised/effigy
Rim :: Body	Bates 15 or Barrington 5 :: plain
Paste	SOFT, GRANULAR, COMPACT
Temper	GROG
Color, Core	
Color, Exterior	RED (2.5YR4/8)
Color, Interior	RED (2.5YR4/8)
Overall Height cm	7.7
Weight g	326
Volume liters	
Use/Wear/Condition	VESSEL RECONSTRUCTED AND BADLY PLASTERED (TAIL TAB), NO APPARENT WEAR, SLIP WORN OFF INTERIOR OF HEAD
Shape / Description	SMALL EFFIGY VESSEL, SHALLOW BOWL WITH ANIMAL HEAD (FOX?) RIDING ON RIM FACING UP; ABRUPT BREAK BETWEEN BASE AND BODY
Lip Treatment	FLATTENED, DIRECT
Orifice Diameter cm	13.9
Rim Height cm	2.6
Rim Thickness cm	.6
Rim Surface Treatment	SMOOTHED & BURNISHED & SLIPPED
Rim Decorative Treatment	RED SLIPPED INT AND EXT AND ORANGE INCISED HORIZONTAL LINES-PARTLY SMOOTHED OVER 4 INCISED LINES (0.1CM WIDE, .5-.6CM APART), NO OVERHANGING-5 UNDER HEAD APPENDAGE
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	11.6
Body Height cm	4.8
Body Thickness cm	.6
Body Surface Treatment	SMOOTHED & BURNISHED & SLIPPED
Body Decorative Treatment	
Body Shape	CONICAL
Base Shape	CIRCULAR, FLAT; BASE RECONSTR WITH PLASTER
Base Diameter cm	8.8
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	ANIMAL HEAD ON RIM-TAIL LUG RECONSTR WITH PLASTER
Notes	Huddleston Grave B, 11/21/1942 (with 1-2, 1-3) East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-16, 2097 (Huddleston 245?)
Vessel Form	Bottle, pedestalled
AAS/HSU Digital Photo No.	1817
Type	Keno Trailed *var. Red Hill*
Decoration	incised/trailed
Rim :: Body	plain :: Belhaven 33 (type)
Paste	SOFT, FINE, SILTY, COMPACT
Temper	SHELL (SOME LEACHED)
Color, Core	VERY DARK GRAYISH BROWN (10YR3/2)
Color, Exterior	REDDISH YELLOW (5YR6/6), YELLOWISH RED (5YR4/8), GRAY (10YR5/1)
Color, Interior	LIGHT YELLOWISH BROWN (10YR6/4), DARK GRAYISH BROWN (10YR4/2)
Overall Height cm	17.9
Weight g	514
Volume liters	
Use/Wear/Condition	NO USEWEAR APPARENT, VESSEL BROKEN,POORLY MENDED, PLASTERED. BOTTLE IRREGULAR.
Shape / Description	SHORT SQUAT BOTTLE WITH SHORT NECK AND FLARED RIM, PEDESTAL BASE
Lip Treatment	FLAT, EVERTED
Orifice Diameter cm	5.8
Rim Height cm	5.4
Rim Thickness cm	.6
Rim Surface Treatment	SMOOTHED & BURNISHED
Rim Decorative Treatment	WIDE LINE (2-3MM) ENGRAVED AROUND BOTTLE NECK AT JUNCTION OF NECK AND BODY
Rim/Neck Shape	SPOOL
Body Maximum Diameter cm	14.3
Body Height cm	10.8
Body Thickness cm	.6
Body Surface Treatment	SMOOTHED & BURNISHED
Body Decorative Treatment	INCISED, VERY REGULAR LINES SPACED ABOUT 1-2MM APART
Body Shape	SUB-GLOBULAR
Base Shape	CIRCULAR, CONCAVE, PEDESTAL
Base Diameter cm	8.7
Base Height cm	1.6
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 7, 8/5/1939 (with 1-33), late Social Hill to Deceiper phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-17, 2726
Vessel Form	beaker
AAS/HSU Digital Photo No.	K5133
Type	East Incised
Decoration	incised
Rim :: Body	Barrington 1 :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG
Color, Core	
Color, Exterior	5YR5/6, 10YR4/1, 7.5YR6/6
Color, Interior	7.5YR5/4, 10YR6/1
Overall Height cm	11.1
Weight g	376
Volume liters	0.775
Use/Wear/Condition	
Shape / Description	BEAKER WITH INCISING AT RIM, 2 SUSPENSION HOLES
Lip Treatment	ROUNDED
Orifice Diameter cm	10.7
Rim Height cm	
Rim Thickness cm	0.43
Rim Surface Treatment	
Rim Decorative Treatment	INCISED LINES, 7 LINES 1MM THICK, 2-4MM APART, A LITTLE SLOPPY, PARTLY SMOOTHED OVER
Rim/Neck Shape	CONVEX, INSLANTED
Body Maximum Diameter cm	12.2
Body Height cm	
Body Thickness cm	0.6
Body Surface Treatment	BURNISHED
Body Decorative Treatment	PLAIN
Body Shape	OVOID
Base Shape	CIRCULAR, SLIGHTLY CONVEX
Base Diameter cm	8
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	SUSPENSION HOLES 2 HOLES .3MM DRILLED FROM OUTSIDE AND INSIDE AFTER FIRING
Notes	Huddleston Grave D, 12/13/1942 (with 1-7), East phase; previous illustration Newell & Krieger 1949: Fig. 65D

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-18, 2710
Vessel Form	beaker
AAS/HSU Digital Photo No.	K5165
Type	East Incised
Decoration	incised
Rim :: Body	Bates 3 :: plain
Paste	
Temper	GROG
Color, Core	
Color, Exterior	5YR5/6, 5YR4/4, 10YR6/3
Color, Interior	
Overall Height cm	11.8
Weight g	438
Volume liters	0.7
Use/Wear/Condition	FIRECLOUDS ON BODY
Shape / Description	BEAKER WITH INCISED LINES AND SUSPENSION HOLES
Lip Treatment	ROUND FLATTENED
Orifice Diameter cm	11.6
Rim Height cm	
Rim Thickness cm	0.5
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	INCISED LINES, 4 CONCENTRIC LINES 5-9MM APART, 1MM WIDE
Rim/Neck Shape	STRAIGHT, SLIGHTLY OUTSLANTED
Body Maximum Diameter cm	11.2
Body Height cm	
Body Thickness cm	0.5
Body Surface Treatment	BURNISHED
Body Decorative Treatment	PLAIN
Body Shape	OVOID
Base Shape	CIRCULAR, FLAT
Base Diameter cm	7.7
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	SUSPENSION HOLES, 2, DRILLED FROM OUTSIDE, AT LEVEL OF INCISED LINES
Notes	Huddleston Grave C, 12/12/1942 (with 1-25), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-19, 2690
Vessel Form	beaker
AAS/HSU Digital Photo No.	591
Type	East Incised
Decoration	red slipped/incised
Rim :: Body	Barrington 7 :: plain
Paste	
Temper	GROG & CLAYGRIT
Color, Core	
Color, Exterior	RED, GRAY, REDDISH YELLOW
Color, Interior	RED, GRAY, REDDISH YELLOW
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRE CLOUDS
Shape / Description	JAR-BEAKER
Lip Treatment	DIRECT
Orifice Diameter cm	10.0
Rim Height cm	2.1
Rim Thickness cm	.7
Rim Surface Treatment	SMOOTHED & BURNISHED & SLIPPED
Rim Decorative Treatment	INCISED
Rim/Neck Shape	CONVEX, VERTICAL
Body Maximum Diameter cm	10.9
Body Height cm	10.2
Body Thickness cm	.6
Body Surface Treatment	SMOOTHED & BURNISHED & SLIPPED
Body Decorative Treatment	
Body Shape	BARREL SHAPED
Base Shape	CIRCULAR, FLAT
Base Diameter cm	7.5
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	SUSPENSION HOLES
Notes	Huddleston Grave A', 11/14/1942 (with 1-4, 1-30, 1-31, 1-46?), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-20, 2729
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	K5129
Type	Pease Brushed-Incised
Decoration	incised/punctated
Rim :: Body	Andes 10? :: Alma 3
Paste	HARD, SMOOTH, COMPACT
Temper	GROG
Color, Core	10YR8/4, 2.5YR6/8
Color, Exterior	5YR6/6, 5YR4/1, 7.5YR7/6
Color, Interior	5YR6/6, 10YR4/1
Overall Height cm	17.4
Weight g	767
Volume liters	1.8
Use/Wear/Condition	NONE; MISSING PIECES OF RIM/LIP AND BODY
Shape / Description	TALL RIM JAR, INCISED
Lip Treatment	ROUNDED
Orifice Diameter cm	15.2
Rim Height cm	4.7
Rim Thickness cm	0.722
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	INCISED DIAGONAL LINES SEP. BY TOOL PUNCT.
Rim/Neck Shape	SLIGHTLY CONCAVE, OUTSLANTED
Body Maximum Diameter cm	16.6
Body Height cm	15.2
Body Thickness cm	0.756
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	WIDE INCISING, VERTICAL LINES SEPARATING NESTED TRIANGLES
Body Shape	OVOID
Base Shape	CIRCULAR, FLAT
Base Diameter cm	9.236
Base Height cm	
Base Surface Treatment	SMOOTHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave E, 12/18/1942, East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-21, 2643
Vessel Form	jar, short rim
AAS/HSU Digital Photo No.	1144
Type	sim. to Military Road Incised
Decoration	brushed/incised/punctated
Rim :: Body	Dana 4 :: Altus 4
Paste	MEDIUM-HARD, COARSE, CRUMBLY
Temper	GROG
Color, Core	5YR5/1, 5YR6/1
Color, Exterior	5YR5/4, 5YR4/3, 5YR4/1
Color, Interior	5YR6/6, 5YR5/6, 5YR6/2
Overall Height cm	12.9
Weight g	352
Volume liters	
Use/Wear/Condition	NONE APPARENT, VESSEL INTACT EXCEPT FOR BROKEN RIM-ABOUT HALF OF RIM MISSING WITH 2 SHERDS GLUED IN
Shape / Description	SHORT RIM JAR, INCISED/PUNCTATED DECORATION
Lip Treatment	FLATTENED, SLIGHTLY BEVELED, SLIGHTLY EVERTED
Orifice Diameter cm	11.0
Rim Height cm	2.9
Rim Thickness cm	.4
Rim Surface Treatment	BRUSHED
Rim Decorative Treatment	
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	11.4
Body Height cm	10
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED & BURNISHED (INTERIOR)
Body Decorative Treatment	BODY COVERED WITH INCISING (SHORT HERRINGBONE DESIGN) AND PUNCTATIONS IN 3 LINES (LOOKS LIKE SQUARISH RATHER THAN 'C'-ISH)
Body Shape	HIGH-WAISTED, ELONGATED
Base Shape	CIRCULAR, FLAT
Base Diameter cm	7.0
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Related to Sinner Linear Punctated? Huddleston Grave XX, 9/19/1942 (with 1-22), East to Mid-Ouachita phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-22, 2642
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	1167
Type	Pease Brushed-Incised?
Decoration	incised/applique
Rim :: Body	Butler 1 :: Alma 3?
Paste	MEDIUM-HARD, COMPACT
Temper	GROG
Color, Core	
Color, Exterior	5YR6/4, 5YR6/2, 5YR5/6
Color, Interior	5YR5/3, 5YR5/6, SOOTING
Overall Height cm	12.4
Weight g	388
Volume liters	
Use/Wear/Condition	SOOTING ON VESSEL INTERIOR, INSIDE LIP, TRACE ON EXTERIOR AROUND SHOULDER. CHIP OFF RIM
Shape / Description	SMALL TALL RIM JAR - FLAT BOTTOMED, SUBGLOBULAR BODY - FLARED RIM - INCISED AND NODED DECORATION
Lip Treatment	ROUNDED, SLIGHTLY EVERTED
Orifice Diameter cm	12.3
Rim Height cm	3.9
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	INCISED DECORATION - MULTIPLE HORIZONTAL LINES (13-14 LINES), LINES <.1 WIDE - 2-3MM APART
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	11.5
Body Height cm	8.3
Body Thickness cm	4
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	INCISED DECORATION-MULTIPLE INCISED LINES FORM DIAGONAL PATTERNS - SEPARATED INTO PANELS WITH NODES AND VERTICAL LINES (3-4)
Body Shape	SUBGLOBULAR, MAX DIA. 1/3 WAY FROM TOP OF BODY
Base Shape	CIRCULAR, FLAT
Base Diameter cm	7.3
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	7 ELONGATED NODES APPLIQUED AROUND BODY AT MAX BODY DIAM. - NOT HANDLES OR TABS
Notes	Huddleston Grave XX, 9/19/1942 (with 1-21), East to Mid-Ouachita phase; previous illustration Newell & Krieger 1949: Fig. 65M

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-23, 2512
Vessel Form	bottle
AAS/HSU Digital Photo No.	K5141
Type	Adair Engraved
Decoration	engraved/appliqued
Rim :: Body	Eagle 3 :: Eric 1
Paste	SOFT, SMOOTH, COMPACT
Temper	GROG
Color, Core	
Color, Exterior	5YR5/6, 7.5YR5/2, 7.5YR3/1
Color, Interior	
Overall Height cm	22.4
Weight g	640
Volume liters	1.4
Use/Wear/Condition	NONE; SURFACE IS ERODED AND WORN
Shape / Description	BOTTLE, ENGRAVED AND APPLIQUE
Lip Treatment	ROUNDED, SMOOTHED
Orifice Diameter cm	4.3
Rim Height cm	7.7
Rim Thickness cm	0.52
Rim Surface Treatment	ERODED
Rim Decorative Treatment	INCISED LINE AT JUNCTION OF NECK & BODY
Rim/Neck Shape	INSLOPING
Body Maximum Diameter cm	14.5
Body Height cm	14.9
Body Thickness cm	
Body Surface Treatment	ERODED
Body Decorative Treatment	CONCENTRIC ENGR LINES, CROSSHATCHED, VERTICAL IRREGULAR APPLIQUES
Body Shape	LOW-WAISTED
Base Shape	CIRCULAR
Base Diameter cm	13
Base Height cm	
Base Surface Treatment	ERODED
Base Decorative Treatment	
Appendages	VERTICAL APPLIQUED STRIPS ON BODY
Notes	Huddleston Grave X or Y, 12/6/1941 (with 1-47), Mid-Ouachita phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-24, 2742
Vessel Form	bottle
AAS/HSU Digital Photo No.	1408
Type	Smithport Plain
Decoration	plain
Rim :: Body	plain :: plain
Paste	GRANULAR, GRITTY
Temper	GROG & CLAYGRIT
Color, Core	
Color, Exterior	REDDISH YELLOW, BLACK FIRECLOUDS
Color, Interior	
Overall Height cm	29.9
Weight g	710
Volume liters	
Use/Wear/Condition	FIRECLOUDS, BLACK RESIDUE ON BODY EXTERIOR
Shape / Description	TALL, GLOBULAR BOTTLE WITH VERY TALL NECK. FLAT, CIRCULAR BASE
Lip Treatment	ROUNDED
Orifice Diameter cm	4.0
Rim Height cm	15.2
Rim Thickness cm	.3
Rim Surface Treatment	SMOOTHED & SLIPPED
Rim Decorative Treatment	
Rim/Neck Shape	INSLOPING, LONG NECKED
Body Maximum Diameter cm	13.4
Body Height cm	14.7
Body Thickness cm	
Body Surface Treatment	SMOOTHED & SLIPPED
Body Decorative Treatment	
Body Shape	BARREL SHAPED
Base Shape	CIRCULAR, FLAT
Base Diameter cm	8.5
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave F, 1/1/1943 (with 1-8, 1-29, 1-43, 1-44?), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-25, 2708
Vessel Form	bottle
AAS/HSU Digital Photo No.	K5150
Type	sim. to Hickory Fine Engraved
Decoration	Incised (dry paste)
Rim :: Body	Bates 9 :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG
Color, Core	7.5YR5/3
Color, Exterior	5YR4/6, 7.5YR5/2, 7.5YR3/1
Color, Interior	
Overall Height cm	25.5
Weight g	890
Volume liters	1.3
Use/Wear/Condition	FIRECLOUDING ON BODY & NECK; SCUFFING ON SIDE AND BOTTOM
Shape / Description	INCISED BOTTLE PEDESTAL BASE
Lip Treatment	
Orifice Diameter cm	
Rim Height cm	11
Rim Thickness cm	0.455
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	
Rim/Neck Shape	INSLOPING
Body Maximum Diameter cm	15.5
Body Height cm	10.5
Body Thickness cm	
Body Surface Treatment	BURNISHED
Body Decorative Treatment	INCISED, 6 CONCENTRIC LINES BELOW NECK, 1MM WIDE, 5MM APART, DRY PASTE INCISIING
Body Shape	SUBGLOBULAR
Base Shape	CIRCULAR, FLAT, PEDESTAL
Base Diameter cm	11
Base Height cm	4
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave C, 12/12/1942 (with 1-18), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-28, 2493
Vessel Form	jar, short rim
AAS/HSU Digital Photo No.	K5159
Type	
Decoration	incised/punctated
Rim :: Body	Caldwell 3? :: Claflin new
Paste	HARD, SMOOTH, COMPACT
Temper	GROG
Color, Core	10YR6/2, 7.5YR4/2
Color, Exterior	2.5YR6/6, 7.5YR6/4, 10YR6/1
Color, Interior	5YR6/6, 10YR6/2
Overall Height cm	9.9
Weight g	246
Volume liters	0.3
Use/Wear/Condition	NONE; MISSING MOST OF RIM/LIP, PART OF BODY
Shape / Description	JAR, SHORT RIM, INCISED & PUNCTATED
Lip Treatment	FLATTENED, SLIGHTLY EVERTED
Orifice Diameter cm	9.6
Rim Height cm	2.4
Rim Thickness cm	0.535
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	2-3 ROW OF PUNCTATES UNDER LIP, ROW OF CURVED LINES EXTENDING TO BODY
Rim/Neck Shape	STRAIGHT, SLIGHTLY OUTSLANTED
Body Maximum Diameter cm	10.5
Body Height cm	8
Body Thickness cm	0.582
Body Surface Treatment	SMOOTHED, ERODED
Body Decorative Treatment	INCISED, PUNCTATED, INCISED SECTIONS FRAMED BY PUNCT DESIGN
Body Shape	HIGH WAISTED
Base Shape	CIRCULAR, FLAT
Base Diameter cm	6.2
Base Height cm	
Base Surface Treatment	SMOOTHED, ERODED
Base Decorative Treatment	
Appendages	
Notes	Related to Sinner Linear-Punctated?; Huddleston Grave X, 5/9/1941 (with 1-1, 1-5, 1-9), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-29, 2744
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	K8188
Type	Pease Brushed-Incised
Decoration	incised
Rim :: Body	Beloit 1 :: Alpha 2
Paste	HARD, SMOOTH, COMPACT
Temper	GROG
Color, Core	
Color, Exterior	5YR5/8, 5YR7/4, 5YR6/3
Color, Interior	7.5YR3/1
Overall Height cm	19.5
Weight g	989
Volume liters	2.1
Use/Wear/Condition	WEAR ON BOTTOM; CARBONIZED ON INTERIOR (SPOTTY BLACK RESIDUE ON BASE & EXT) PUBL SUHM & JELKS 1962 PLATE 60E
Shape / Description	JAR, TALL RIM, INCISED
Lip Treatment	BEVELED EXT
Orifice Diameter cm	17.5
Rim Height cm	6
Rim Thickness cm	0.4
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	4 RIM PEAKS, ROW OF PUNCTATES, 5-6 HORIZ INCISED LINES, ROW VERT PUNCT
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	15
Body Height cm	13.5
Body Thickness cm	0.7
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	INCISED, VERT INCISED LINES DIVIDE CHEVRONS
Body Shape	HIGH-WAISTED
Base Shape	CIRCULAR, FLAT
Base Diameter cm	9
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave F, 1/1/1943 (with 1-8, 1-24, 1-43, 1-44?), East phase; previous illustration Newell & Krieger 1949: Fig. 65N; Suhm & Jelks 1962: Plate 60E

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-30, 2688
Vessel Form	bottle
AAS/HSU Digital Photo No.	587
Type	Smithport Plain
Decoration	red slipped
Rim :: Body	plain :: plain
Paste	HARD, GRITTY, COMPACT
Temper	GROG & CLAYGRIT
Color, Core	
Color, Exterior	RED
Color, Interior	
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	FIRE CLOUDS
Shape / Description	BOTTLE-GLOBULAR BODY AND LONG NECK; FLAT BASE
Lip Treatment	DIRECT
Orifice Diameter cm	4.0
Rim Height cm	16.2
Rim Thickness cm	.4
Rim Surface Treatment	SMOOTHED & SLIPPED
Rim Decorative Treatment	
Rim/Neck Shape	INSLOPING, LONG NECK
Body Maximum Diameter cm	14.9
Body Height cm	12.7
Body Thickness cm	
Body Surface Treatment	SMOOTHED & SLIPPED
Body Decorative Treatment	
Body Shape	GLOBULAR
Base Shape	CIRCULAR, FLAT
Base Diameter cm	11.2
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave A', 11/14/1942 (with 1-4, 1-19, 1-31, 1-46?), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-31, 2692
Vessel Form	bottle
AAS/HSU Digital Photo No.	K8168
Type	Hickory Fine Engraved
Decoration	engraved
Rim :: Body	plain :: Erie 13
Paste	HARD, SMOOTH, COMPACT
Temper	GROG & BONE
Color, Core	
Color, Exterior	7.5YR7/6, 7.5YR8/3
Color, Interior	
Overall Height cm	34.5
Weight g	904
Volume liters	
Use/Wear/Condition	FIRE CLOUDS ON NECK; MISSING SHERD ON NECK AND BODY, PATCHED
Shape / Description	BOTTLE, LONG NECKED
Lip Treatment	FLAT
Orifice Diameter cm	4
Rim Height cm	16
Rim Thickness cm	0.5
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	
Rim/Neck Shape	INSLOPING, LONG NECKED
Body Maximum Diameter cm	17
Body Height cm	18.5
Body Thickness cm	
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	5 ENGRAVED LINES UPPER BODY, THIN LINES 6MM APART
Body Shape	LOW WAISTED
Base Shape	CIRCULAR FLAT
Base Diameter cm	9.5
Base Height cm	
Base Surface Treatment	SMOOTHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave A', 11/14/1942 (with 1-4, 1-19, 1-30, 1-46?), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-32, 1379 (Huddleston 204)
Vessel Form	bowl, carinated
AAS/HSU Digital Photo No.	K8264
Type	Means Engraved
Decoration	engraved
Rim :: Body	Enos 15? 16? :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG & SHELL (LEACHED)
Color, Core	10YR4/1
Color, Exterior	10YR3/1, 10YR4/2, 7.5YR4/3
Color, Interior	10YR4/2, 10YR2/1
Overall Height cm	7
Weight g	234
Volume liters	
Use/Wear/Condition	FIRECLOUDING;PARTIAL, MISSING LG PIECES OF LIP, RIM, BODY
Shape / Description	CARINATED BOWL
Lip Treatment	FLATTENED, SLIGHTLY EVERTED
Orifice Diameter cm	17.3
Rim Height cm	3
Rim Thickness cm	0.5
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	ENGRAVED, ALTERNATING PATTERN WITH TICKED LINES, NODES
Rim/Neck Shape	STRAIGHT, INSLANTED
Body Maximum Diameter cm	18
Body Height cm	4
Body Thickness cm	0.4
Body Surface Treatment	BURNISHED
Body Decorative Treatment	
Body Shape	CONICAL
Base Shape	CIRCULAR, SLIGHTLY CONCAVE
Base Diameter cm	5
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	2 SMALL NODES AT BASE OF RIM
Notes	Huddleston Grave 3, 4/29-5/5/1939 (with 1-13, 1-34, 1-41?, 1-50), late Social Hill to Deceiper phase; Phillips photo 3927

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-33, 2098 (Huddleston 244)
Vessel Form	bowl, carinated
AAS/HSU Digital Photo No.	K8269
Type	Means Engraved
Decoration	engraved
Rim :: Body	Enos 14 :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	SHELL (LEACHED) & GROG
Color, Core	7.5YR4/1
Color, Exterior	5YR7/6, 5YR4/1, 7.5YR6/4
Color, Interior	7.5YR7/3, 7.5YR4/1
Overall Height cm	7.2
Weight g	256
Volume liters	
Use/Wear/Condition	A LITTLE FIRECLOUDING; PART OF BASE & RIM MISSING
Shape / Description	CARINATED BOWL
Lip Treatment	ROUNDED, SLIGHTLY EVERTED
Orifice Diameter cm	17.4
Rim Height cm	2.4
Rim Thickness cm	0.5
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	ENGRAVED; 3 TICKED LINES, HORIZ, REPEATS 2X
Rim/Neck Shape	STRAIGHT, INSLANTED
Body Maximum Diameter cm	18.8
Body Height cm	4.8
Body Thickness cm	0.6
Body Surface Treatment	BURNISHED
Body Decorative Treatment	
Body Shape	CONICAL
Base Shape	CIRCULAR, FLAT
Base Diameter cm	4.5
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	2 NODES AT RIM/BODY JUNCTURE WITH 'SUNRISE' DEC ABOVE
Notes	Huddleston Grave 7, 8/5/1939 (with 1-16), late Social Hill to Deceiper phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-34, 1373 (Huddleston 202)
Vessel Form	bowl
AAS/HSU Digital Photo No.	1348
Type	Maddox Engraved
Decoration	engraved/notched lip/slipped?
Rim :: Body	Cornell :: Elmira? Erasmus?
Paste	HARD, COMPACT
Temper	NONE VISIBLE
Color, Core	
Color, Exterior	BLACK, BROWN, REDDISH BROWN
Color, Interior	YELLOWISH BROWN
Overall Height cm	9.0
Weight g	270
Volume liters	
Use/Wear/Condition	
Shape / Description	SQUAT, GLOBULAR BOWL WITH SUSPENSION HOLE TABS ON RIM, POORLY DEFINED FLAT BASE
Lip Treatment	INCURVED, PUNCTATED
Orifice Diameter cm	8.9
Rim Height cm	
Rim Thickness cm	
Rim Surface Treatment	
Rim Decorative Treatment	
Rim/Neck Shape	CONVEX, INSLANTED
Body Maximum Diameter cm	13.3
Body Height cm	8.6
Body Thickness cm	.4
Body Surface Treatment	SMOOTHED & SLIPPED & BURNISHED
Body Decorative Treatment	ENGRAVING
Body Shape	SUB-GLOBULAR
Base Shape	CIRCULAR, FLAT
Base Diameter cm	4.3
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	2 OPPOSING RIM TABS WITH SUSPENSION HOLES
Notes	Huddleston Grave 3, 4/29-5/5/1939 (with 1-13, 1-32, 1-41?, 1-50), late Social Hill to Deceiper phase; Phillips photo 3869

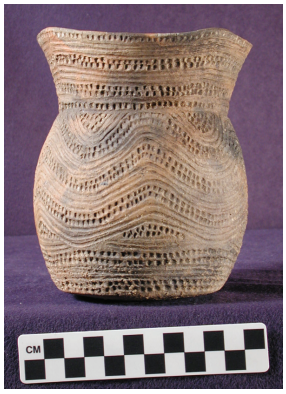
JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-35, 1388 (Huddleston 226?)
Vessel Form	bowl, simple
AAS/HSU Digital Photo No.	1113
Type	
Decoration	notched lip
Rim :: Body	Cornell :: plain
Paste	HARD, FINE, COMPACT
Temper	GROG
Color, Core	
Color, Exterior	10YR3/2, 10YR2/1, 10YR4/3
Color, Interior	
Overall Height cm	10.7
Weight g	474
Volume liters	
Use/Wear/Condition	SOME SCRATCHES ON INSIDE ON LOWER EDGES, RIM IS A LITTLE ERODED. HAS REMNANTS OF OLD RED TAG ON INSIDE VESSEL IN 3 PIECES AND HAD BEEN GLUED TOGETHER
Shape / Description	OPEN BOWL-SEMIROUNDED BASE- FLARED WALLS-SLIGHTLY OUTFLARED RIM
Lip Treatment	ROUNDED, SLIGHTLY EVERTED, NOTCHING ON LIP, 3-7MM APART
Orifice Diameter cm	16.7
Rim Height cm	
Rim Thickness cm	.5
Rim Surface Treatment	
Rim Decorative Treatment	
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	16.7
Body Height cm	10.7
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED & BURNISHED
Body Decorative Treatment	PLAIN
Body Shape	CONICAL
Base Shape	UNDISTINGUISHED, CONVEX
Base Diameter cm	
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	sim. To Hardman Engraved in shape, lip notching; Huddleston Grave 4, 5/27/1939 (with 1-38, 1-39, 1-42), late Mid-Ouachita to Social Hill phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-36, 1376 (Huddleston 199)
Vessel Form	bowl, carinated, tall rim
AAS/HSU Digital Photo No.	K8437
Type	Means Engraved ?
Decoration	engraved
Rim :: Body	Elgin 12 :: Enos new
Paste	HARD, SMOOTH, COMPACT
Temper	GROG & SHELL (LEACHED)
Color, Core	
Color, Exterior	5YR5/2, 5YR3/1, 5YR6/4
Color, Interior	5YR6/4, 5YR3/1
Overall Height cm	7.8
Weight g	142
Volume liters	0.4
Use/Wear/Condition	SOME INT/EXT PITTING, PROB POST-DEP; 1/4 OF RIM MISSING, RECONST W RED PLASTER
Shape / Description	CARINATED BOWL W TALL RIM
Lip Treatment	ROUNDED, THINNED
Orifice Diameter cm	12
Rim Height cm	3.8
Rim Thickness cm	0.3
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	ENGRAVED, 4 HORIZ LINES, TICKED & PLAIN
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	10.2
Body Height cm	4
Body Thickness cm	0.4
Body Surface Treatment	BURNISHED
Body Decorative Treatment	ENGRAVED, DIAGONAL TICKED LIINES ON UPPER BODY, RED PIGMENT IN LINES
Body Shape	COMPOUND, CONICAL/CYLINDRICAL
Base Shape	CIRCULAR, FLAT
Base Diameter cm	4.5
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 1 or 2, 4/29/1939 (with 1-12, 1-48, 1-49), late Social Hill to Deceiper phase, Phillips photo 3870

JEC Hodges Collection, 77-1
East Place, 3CL21



Item No./Hodges Catalog	1-37, 2756
Vessel Form	jar, short rim
AAS/HSU Digital Photo No.	1345
Type	Military Road Incised (early variant?)
Decoration	incised/punctated
Rim :: Body	Beloit 2 (type) :: Clinton 12 (type), Bard 2?
Paste	
Temper	GROG & CLAYGRIT
Color, Core	
Color, Exterior	REDDISH YELLOW, RED, LIGHT RED
Color, Interior	DARK GRAY, RED
Overall Height cm	14.4
Weight g	476
Volume liters	
Use/Wear/Condition	FIRE CLOUD
Shape / Description	JAR; GLOBULAR BODY; ROUNDED BASE; FLARED RIM; SLIGHTLY CASTELATED RIM
Lip Treatment	CASTELATED
Orifice Diameter cm	11.7
Rim Height cm	4.1
Rim Thickness cm	.6
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	PUNCTATED, INCISED
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	11.3
Body Height cm	9.7
Body Thickness cm	.5
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	PUNCTATED, INCISED
Body Shape	SUB-GLOBULAR
Base Shape	CIRCULAR, FLAT
Base Diameter cm	8.7
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave G, 1/16/1943 (with 1-6), East to Mid-Ouachita phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-38, 1387 (Huddleston 229?)
Vessel Form	bowl, carinated
AAS/HSU Digital Photo No.	K5280
Type	Glassell Engraved ?
Decoration	engraved/punctated
Rim :: Body	Enos 10? 11? 12? :: plain
Paste	SOFT, SMOOTH, COMPACT
Temper	SHELL (LEACHED) & GROG
Color, Core	7.5YR5/1
Color, Exterior	7.5YR2.5/1, 7.5YR6/1, 7.5YR5/1
Color, Interior	7.5YR5/1
Overall Height cm	6.6
Weight g	266
Volume liters	1
Use/Wear/Condition	SOME WEAR ON BASE; SECTION OF RIM/NECK MISSING
Shape / Description	CONICAL-CARINATED BOWL
Lip Treatment	ROUNDED, EVERTED
Orifice Diameter cm	17.4
Rim Height cm	3
Rim Thickness cm	0.6
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	PUNCTATES AND ENGRAVED CONC LINES
Rim/Neck Shape	STRAIGHT, INSLANTED
Body Maximum Diameter cm	17.6
Body Height cm	3.6
Body Thickness cm	0.4
Body Surface Treatment	BURNISHED
Body Decorative Treatment	
Body Shape	CONVEX
Base Shape	CIRCULAR, FLAT
Base Diameter cm	6
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 4, 5/27/1939 (with 1-35, 1-39, 1-42), late Mid-Ouachita to Social Hill phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-39, 1384 (Huddleston 227?)
Vessel Form	bowl, simple
AAS/HSU Digital Photo No.	K5329
Type	
Decoration	notched lip
Rim :: Body	Cornell 7 :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG & SHELL (LEACHED)
Color, Core	5YR2.5/1
Color, Exterior	5YR5/4, 5YR3/1
Color, Interior	5YR3/1
Overall Height cm	11
Weight g	334
Volume liters	
Use/Wear/Condition	NONE SEEN; ABOUT 2/3 OF VESSEL MISSING
Shape / Description	BOWL, SIMPLE
Lip Treatment	ROUNDED, PUNCTATED/NOTCHED ON TOP OF LIP
Orifice Diameter cm	20
Rim Height cm	11
Rim Thickness cm	0.52
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	20
Body Height cm	
Body Thickness cm	0.7
Body Surface Treatment	BURNISHED
Body Decorative Treatment	
Body Shape	CONICAL
Base Shape	UNDISTINGUISHED, FLAT
Base Diameter cm	6
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 4, 5/27/1939 (with 1-35, 1-38, 1-42), late Mid-Ouachita to Social Hill phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-40
Vessel Form	jar, short rim
AAS/HSU Digital Photo No.	N2494
Type	sim to Smithport Plain
Decoration	
Rim :: Body	plain :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG & GRIT (MICA, ABUNDANT)
Color, Core	5YR3/1
Color, Exterior	2.5YR5/6, 5YR5/4, 2.5YR2.5/1
Color, Interior	2.5YR2.5/1
Overall Height cm	13
Weight g	678
Volume liters	1.5
Use/Wear/Condition	ABRASION ON BASE, BLACKENED INT BUT NO APPARENT SOOTING; FIRE CLOUDS ON EXT
Shape / Description	JAR, SHORT RIM
Lip Treatment	FLAT, SLIGHTLY EVERTED
Orifice Diameter cm	12.1
Rim Height cm	2.5
Rim Thickness cm	0.5
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	RED COLORING LOOKS LIKE FIRING, NOT SLIP, BUT POSS RED OCHRE RUBBED
Rim/Neck Shape	CONCAVE, INSLANTED
Body Maximum Diameter cm	18.2
Body Height cm	10.5
Body Thickness cm	0.6
Body Surface Treatment	BURNISHED
Body Decorative Treatment	RED COLOR LOOKS LIKE FIRING OR OCHRE RUBBED
Body Shape	SUBGLOBULAR
Base Shape	UNDISTINGUISHED, CONVEX
Base Diameter cm	
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	PLAIN, TRACE RED COLOR
Appendages	
Notes	ASSOCIATED VESSEL – human bone found inside jar, no info on context

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-41, 1380 (Huddleston 201)
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	N2856
Type	Cowhide/Foster Trailed-Incised
Decoration	incised/punctated
Rim :: Body	Chatham 9 :: Baker 16? 21?
Paste	SOFT, SMOOTH, CRUMBLY
Temper	SHELL (LEACHED)
Color, Core	5YR6/4
Color, Exterior	7.5YR6/4, 7.5YR4/1, 5YR5/6
Color, Interior	5YR6/6, 5YR4/2, 5YR4/1
Overall Height cm	14.5
Weight g	399
Volume liters	
Use/Wear/Condition	NONE; SOOTING INT RIM, EXT BODY; MISSING PC OF RIM, FILLED WITH PLASTER
Shape / Description	JAR, TALL RIM
Lip Treatment	ROUNDED
Orifice Diameter cm	19
Rim Height cm	8
Rim Thickness cm	0.4
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	INCISED, PUNCTATED (LADDER PUNCT)
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	14.5
Body Height cm	8
Body Thickness cm	0.4
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	INCISED, NODES; CONCENTRIC CIRCLES WITH CENTRAL NODES, TRAILED LINES
Body Shape	SUBGLOBULAR
Base Shape	CIRCULAR, FLAT/SLIGHTLY CONCAVE
Base Diameter cm	5
Base Height cm	
Base Surface Treatment	SMOOTHED
Base Decorative Treatment	
Appendages	NODES AS PART OF BODY DESIGN
Notes	Huddleston Grave 3?, 5/1939 (201=1380?), late Social Hill to Deceiper phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-42, 1412 (Huddleston 224?)
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	N3280
Type	
Decoration	brushed/punctated
Rim :: Body	Dana 14 :: Danbury 2?
Paste	HARD, SMOOTH, COMPACT
Temper	SHELL (LEACHED)
Color, Core	7.5YR4/1
Color, Exterior	2.5YR5/6, 5YR3/1, 5YR6/6
Color, Interior	5YR3/1, 5YR7/6, 7.5YR5/3
Overall Height cm	22
Weight g	682
Volume liters	
Use/Wear/Condition	NONE NOTED; SOOTING RIM INT/EXT, FIRE CLOUDING; SHERD LOT RECONSTR., MISSING PC OF RIM & ABOUT 1/3 OF BODY
Shape / Description	JAR, TALL RIM
Lip Treatment	FLAT, SLIGHTLY EVERTED
Orifice Diameter cm	21.4
Rim Height cm	9.8
Rim Thickness cm	
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	BRUSHED & PUNCTATED
Rim/Neck Shape	CONCAVE, OUTSLANTED
Body Maximum Diameter cm	18.4
Body Height cm	12.2
Body Thickness cm	0.5
Body Surface Treatment	SMOOTHED
Body Decorative Treatment	BRUSHED
Body Shape	SUB-GLOBULAR
Base Shape	UNDISTINGUISHED, FLAT
Base Diameter cm	8.5
Base Height cm	
Base Surface Treatment	SMOOTHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 4, 5/27/1939 (with 1-35, 1-38, 1-39), late Mid-Ouachita to Social Hill phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-43, 2747
Vessel Form	beaker
AAS/HSU Digital Photo No.	N3034
Type	East Incised
Decoration	incised
Rim :: Body	Bates 17? :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG
Color, Core	7.5YR2.5/1, 2.5YR5/8
Color, Exterior	2.5YR5/6, 7.5YR7/4, 10YR3/1
Color, Interior	2.5YR5/6
Overall Height cm	13
Weight g	403
Volume liters	
Use/Wear/Condition	FIRE CLOUDING; MISSING MORE THAN 1/2 RIM AND SHERDS FROM RIM & BODY
Shape / Description	BEAKER
Lip Treatment	ROUNDED
Orifice Diameter cm	11.5
Rim Height cm	3
Rim Thickness cm	0.5
Rim Surface Treatment	BURNISHED INCISED & RED SLIP; 5 INCISED LINES BELOW LIP, 5-8MM APART, SUSPENSION HOLE
Rim Decorative Treatment	PARTLY SMOOTHED OVER, SOMEWHAT MEANDERING
Rim/Neck Shape	CONVEX, INSLANTED
Body Maximum Diameter cm	11.5
Body Height cm	10
Body Thickness cm	0.5
Body Surface Treatment	BURNISHED
Body Decorative Treatment	RED SLIP
Body Shape	HIGH WAISTED
Base Shape	CIRCULAR, FLAT?
Base Diameter cm	7.1
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	RED SLIP
Appendages	
Notes	Huddleston Grave F, 1/1/1943 (with 1-8, 1-24, 1-29, 1-44?), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-44, 2746
Vessel Form	bowl
AAS/HSU Digital Photo No.	N4840
Type	East Incised
Decoration	incised
Rim :: Body	Bates 3 or Barrington 1 :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG, MEDIUM, ABUNDANT
Color, Core	7.5YR4/1
Color, Exterior	7.5YR4/2, 7.5YR3/2
Color, Interior	7.5YR4/2, 7.5YR2.5/1, 7.5YR5/3
Overall Height cm	9.5
Weight g	156
Volume liters	
Use/Wear/Condition	SOME ROGHENING BASE INT/EXT, SOME SOOTING OR BLACK RESIDUE ON BASE INT/EXT, SHERD LOT WAS PARTIALLY RECONSTR., ABOUT 25% PRESENT
Shape / Description	BOWL, OUTSLANTED RIM
Lip Treatment	SMOOTHED, FLAT LIP, THINNED
Orifice Diameter cm	14 (est., 25%)
Rim Height cm	3.4
Rim Thickness cm	0.3
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	5 HORIZONTAL LINES, INCISED, SMOOTHED OVER, 6-8mm APART
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	
Body Height cm	6.1
Body Thickness cm	0.3
Body Surface Treatment	BURNISHED
Body Decorative Treatment	PLAIN
Body Shape	CONVEX
Base Shape	UNDISTINGUISHED
Base Diameter cm	
Base Height cm	
Base Surface Treatment	BURNISHED/ERODED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave F, 1/1/1943 (with 1-8, 1-24, 1-29, 1-43), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-46, 2691
Vessel Form	jar, tall rim
AAS/HSU Digital Photo No.	N4800
Type	
Decoration	punctated/brushed
Rim :: Body	Andes? :: Danbury 1
Paste	HARD, SMOOTH, COMPACT
Temper	GROG, MEDIUM, ABUNDANT
Color, Core	7.5YR5/2
Color, Exterior	7.5YR5/2, 7.5YR2.5/1, 7.5YR5/6
Color, Interior	7.5YR2.5/1, 7.5YR6/3
Overall Height cm	21.1
Weight g	1092
Volume liters	
Use/Wear/Condition	FIRECLOUDING, SOME SOOTING ON BODY EXT & INT, RECONSTR FROM SHERD LOT, PARTIAL VESSEL
Shape / Description	JAR, TALL RIM
Lip Treatment	SMOOTHED, FLAT/BEVELED EXT. LIP, SLIGHTLY EVERTED
Orifice Diameter cm	17.8
Rim Height cm	7.1
Rim Thickness cm	0.7
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	ROWS OF FINGERNAIL PUNCTATES W/ DIAG. INCISING IN BETWEEN
Rim/Neck Shape	STRAIGHT, OUTSLANTED
Body Maximum Diameter cm	17.3
Body Height cm	14
Body Thickness cm	0.8
Body Surface Treatment	SMOOTHED VERTICAL BRUSHING OR COMBING, NOT OVERLAPPING, REGULAR
Body Decorative Treatment	CLOSESPACED VERT LINES
Body Shape	SUBGLOBULAR
Base Shape	CIRCULAR, FLAT
Base Diameter cm	10
Base Height cm	
Base Surface Treatment	SMOOTHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave A', 11/14/1942 (with 1-4, 1-19, 1-30, 1-31), East phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-47, 2513
Vessel Form	bottle
AAS/HSU Digital Photo No.	K7166
Type	
Decoration	engraved
Rim :: Body	plain :: Elmira 60? Elmhurst 9?
Paste	SOFT, GRITTY, CRUMBLY
Temper	GROG
Color, Core	5YR6/6
Color, Exterior	5YR6/6, 5YR4/1, 5YR5/6
Color, Interior	5YR6/6, 5YR5/6
Overall Height cm	
Weight g	
Volume liters	
Use/Wear/Condition	SHERD LOT, NOT RECONSTRUCTED
Shape / Description	BOTTLE, SHORT WIDE NECK - SHERD LOT, NOT RECONSTRUCTED
Lip Treatment	ROUNDED
Orifice Diameter cm	5.4
Rim Height cm	5.7
Rim Thickness cm	0.3
Rim Surface Treatment	ERODED
Rim Decorative Treatment	
Rim/Neck Shape	INSLOPING
Body Maximum Diameter cm	
Body Height cm	
Body Thickness cm	0.4
Body Surface Treatment	
Body Decorative Treatment	ENGRAVED, RED PIGMENT IN LINES
Body Shape	
Base Shape	
Base Diameter cm	
Base Height cm	
Base Surface Treatment	ERODED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave X or Y, 12/6/1941 (with 1-23), Mid-Ouachita phase

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-48, 1374 (Huddleston 197)
Vessel Form	bowl, carinated
AAS/HSU Digital Photo No.	K7170
Type	Means Engraved
Decoration	engraved
Rim :: Body	Erie 1 :: Enos 9?
Paste	HARD, SMOOTH, COMPACT
Temper	SHELL (LEACHED) & GROG
Color, Core	
Color, Exterior	10YR3/1, 10YR6/2, 5YR7/6
Color, Interior	10YR8/3, 10YR3/1
Overall Height cm	5.5
Weight g	
Volume liters	
Use/Wear/Condition	SPALLING ON BODY; FIRECLOUDING; WAS SHERD LOT, MISSING ABOUT 1/2 RIM AND MORE THAN 1/2 BODY AND BASE
Shape / Description	CARINATED BOWL
Lip Treatment	ROUNDED
Orifice Diameter cm	12.6
Rim Height cm	2
Rim Thickness cm	0.3
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	ENGRAVED W/ RED PIGMENT, RECT. DESIGN OF SPURRED LINES
Rim/Neck Shape	STRAIGHT, VERTICAL
Body Maximum Diameter cm	
Body Height cm	3.5
Body Thickness cm	0.35
Body Surface Treatment	BURNISHED
Body Decorative Treatment	
Body Shape	CONVEX
Base Shape	CIRCULAR, FLAT
Base Diameter cm	
Base Height cm	
Base Surface Treatment	
Base Decorative Treatment	ENGRAVED CONCENTRIC CIRCLES
Appendages	
Notes	Huddleston Grave 1 or 2, 4/29/1939 (with 1-12, 1-36, 1-49), late Social Hill to Deceiper phase; Phillips photo 3886

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-49, 1375 (Huddleston 198)
Vessel Form	bowl, carinated
AAS/HSU Digital Photo No.	K5219
Type	Means Engraved
Decoration	engraved
Rim :: Body	Enos 4? 5? :: plain
Paste	HARD, SMOOTH, COMPACT
Temper	GROG & SHELL (LEACHED)
Color, Core	
Color, Exterior	7.5YR4/2
Color, Interior	7.5YR4/2
Overall Height cm	6
Weight g	281
Volume liters	0.6
Use/Wear/Condition	LARGE CHIP ON LIP
Shape / Description	CARINATED BOWL
Lip Treatment	ROUNDED
Orifice Diameter cm	16.6
Rim Height cm	2.4
Rim Thickness cm	0.582
Rim Surface Treatment	BURNISHED
Rim Decorative Treatment	ENGRAVED WITH PUNCTATES
Rim/Neck Shape	STRAIGHT, VERTICAL
Body Maximum Diameter cm	6.5
Body Height cm	3.6
Body Thickness cm	0.5
Body Surface Treatment	BURNISHED
Body Decorative Treatment	
Body Shape	CONVEX
Base Shape	CIRCULAR, CONCAVE
Base Diameter cm	5
Base Height cm	
Base Surface Treatment	BURNISHED
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 1 or 2, 4/29/1939 (with 1-12, 1-36, 1-48), late Social Hill to Deceiper phase; Phillips photo 3871

JEC Hodges Collection, 77-1
East Place, 3CL21

Item No./Hodges Catalog	1-50, 1372 (Huddleston 208)
Vessel Form	effigy bottle, pedestalled
AAS/HSU Digital Photo No.	427
Type	Keno Trailed
Decoration	incised/trailed/modeled/effigy
Rim :: Body	plain :: Baker 27?
Paste	SOFT, COMPACT
Temper	SHELL (LEACHED)
Color, Core	LIGHT GRAY (10YR8/1)
Color, Exterior	GRAY-SOME FIRECLOUDING (10YR4/2)
Color, Interior	GRAY (10YR4/1)
Overall Height cm	14.7
Weight g	412.2
Volume liters	
Use/Wear/Condition	SOME LIP DAMAGE, PROBABLY POST-DEPOSITIONAL
Shape / Description	BOTTLE, HUMAN FACE EFFIGY, PEDESTAL
Lip Treatment	FLARED
Orifice Diameter cm	6.2
Rim Height cm	4.2
Rim Thickness cm	.5
Rim Surface Treatment	SMOOTHED
Rim Decorative Treatment	
Rim/Neck Shape	SPOOL
Body Maximum Diameter cm	13.7
Body Height cm	9.7
Body Thickness cm	
Body Surface Treatment	SMOOTHED WIDE LINE INCISING/TRAILING AND SURFACE MODELING (NODES)
Body Decorative Treatment	2 HUMAN FACE EFFIGIES ON 2 PANELS WITH VERTICAL LINES IN BETWEEN
Body Shape	SUB-GLOBULAR-MAXIMUM WIDTH IS LOW
Base Shape	CIRCULAR, FLAT, PEDESTAL
Base Diameter cm	7.0
Base Height cm	.8
Base Surface Treatment	
Base Decorative Treatment	
Appendages	
Notes	Huddleston Grave 3, 4/29-5/5/1939 (with 1-13, 1-32, 1-34, 1-41?), late Social Hill to Deceiper phase; Huddleston sketch in notebook; Phillips photo 3857; previous illustration Suhm & Jelks 1962: Plate 44K

A Reconstruction of the Caddo Salt Making Process at Drake's Salt Works

Paul N. Eubanks

Abstract

The Caddo salt makers at the Drake's Salt Works Site Complex in northwestern Louisiana played a critical role in the production and trade of salt during the eighteenth century. Not only was salt used to season food, it would have also been important in the preparation of animal hides and the preservation of meat. Using archaeological data from recent excavations, as well as the historic record, this paper attempts to provide a reconstruction of the salt making process at Drake's Salt Works. This process involved filtering salt-impregnated soil using water from nearby streams and boiling the resulting liquid brine in a thin-walled, standardized bowl. The salt bowls appear to have been made on site using clay deposits found beneath the salt flats. Once the liquid brine had evaporated leaving behind the solid salt, the salt cakes were removed from the salt bowl and prepared for short-term storage or traded to the French, Spanish, or other American Indian groups without direct access to this commodity.

Introduction

From approximately A.D. 1650 until 1865, the Drake's Salt Works Site Complex in northwestern Louisiana was one of the south-central United States' most intensively-utilized salines. The salt produced at this site complex also played an important role in the eighteenth-century trading networks of the Caddo, French, Spanish, Koroa, Natchez, Quapaw, Tunica, and Wichita (Brain 1977, 1979, 1988, 1990; Brown 2004; Gregory 1973; Hofman 1984; Kidder 1998; McWilliams 1981; Swanton 1911, 1928, 1929, 1942, 1946; Webb and Gregory 1978; Wentowski 1970). Using recent archaeological data and historical documentation, this paper aims to provide a better understanding of the Caddo salt making process at Drake's Salt Works. In doing so, its ultimate goal is to offer a glimpse into the daily lives of the Caddo salt makers who worked at this saline.

Prior to the late seventeenth century, there was little motivation for the occupants of northwestern Louisiana to produce large quantities of salt (Eubanks 2014a). However, this was not the case following sustained European contact. While salt was frequently consumed by Europeans and American Indians simply for its taste, this mineral was often added to foods in order to fulfill a physiological requirement. If individuals did not meet this requirement, then their bodies would be unable to retain water and they would eventually die (Daupinée 1960; McCance 1936:823-830; Meneton et al. 2005; Morimoto 1993:389; Whitney et al. 1990). This would have been especially true among populations heavily reliant on plant-based foods low in sodium (e.g., maize) and in cases where salt served an important ritual function (Hunter 1940; Wentowski 1970). Although there is no evidence to suggest that salt was used prehistorically in the traditional Caddo homeland (Figure 1) or the Southeast more broadly to preserve meat, this was not the case following European contact. In addition, the use of salt in the preparation of animal hides also meant that the demand for this mineral would have increased dramatically during the early eighteenth century with the booming hide trade. With such a demand for salt, it may have been possible for the Caddo salt makers at Drake's Salt Works to profit both economically and politically from their participation in the production and exchange of this commodity.

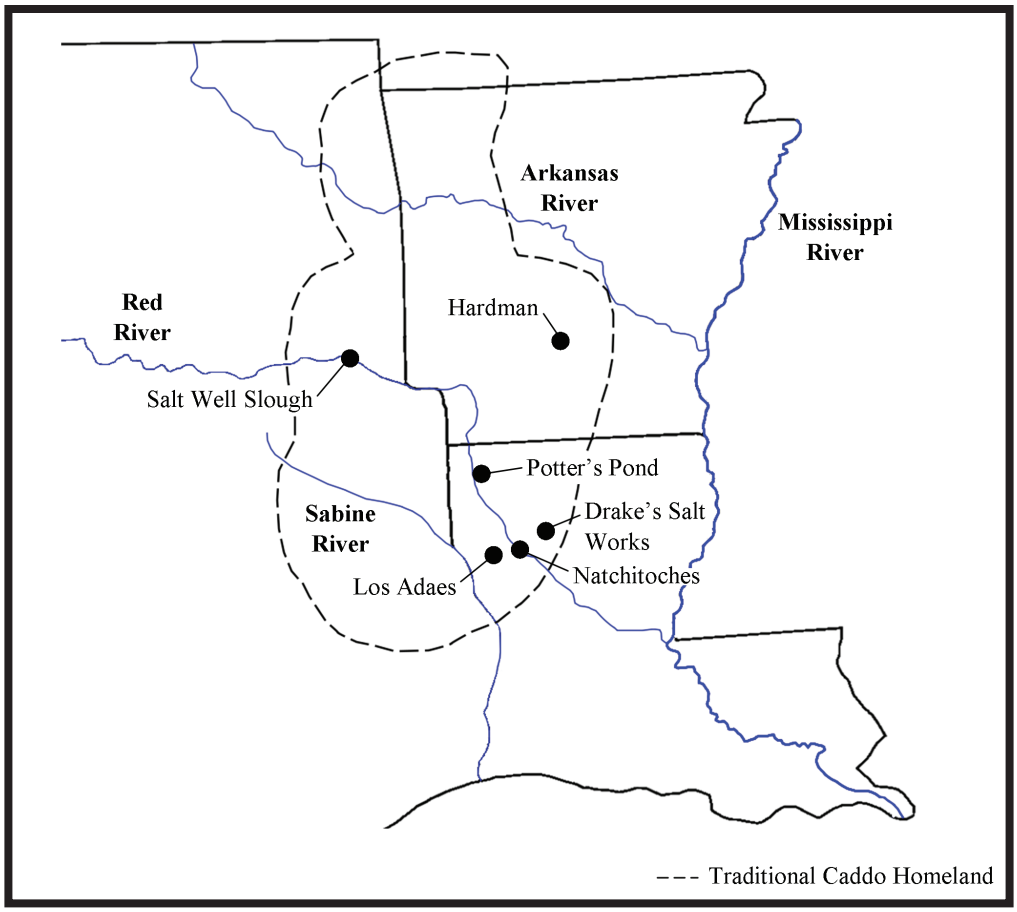


Figure 1. South-Central United States with the locations of sites mentioned in this article.

Drake's Salt Works sits atop a geological deposit known as a salt dome. The surface expression of the Drake's Salt Dome is approximately 1.5 km in diameter and contains several discrete "salt flats," or "licks" (Figure 2). The salt flats range in size from several dozen to several hundred meters in diameter and are composed primarily of salt-impregnated sand and clay. Two of these salt flats, the Upper (16WN30) and Little (16NA11) licks, are known to contain considerable evidence of eighteenth-century salt production (Eubanks 2014a).

In 2008, the United States Forest Service began a shovel testing program at the Upper Lick (16WN30) on a slight rise in the salt flat known as "Widdish Island" after the Caddo word for "salt" (Figure 3) (Eubanks and Smith 2012). Following this initial testing, the Upper Lick has hosted several Passport in Time projects[1]. In the fall of 2012, the Forest Service, in tandem with the Alabama Museum of Natural History's Gulf Coast Survey, surveyed six out of the seven salt licks at Drake's Salt Works. In addition to the Upper Lick, this survey revealed that the Little Lick (Figure 4) was also heavily involved in protohistoric/early historic-period salt production. At present, two 1 x 6 m trenches and forty-four 1 x 1 m test units have been excavated at the Upper Lick while at the Little Lick, three 1 x 6 m trenches and two 1 x 1 m test units have been excavated. Thus far, well over 15,000 salt bowl sherds have been recovered from these excavations.

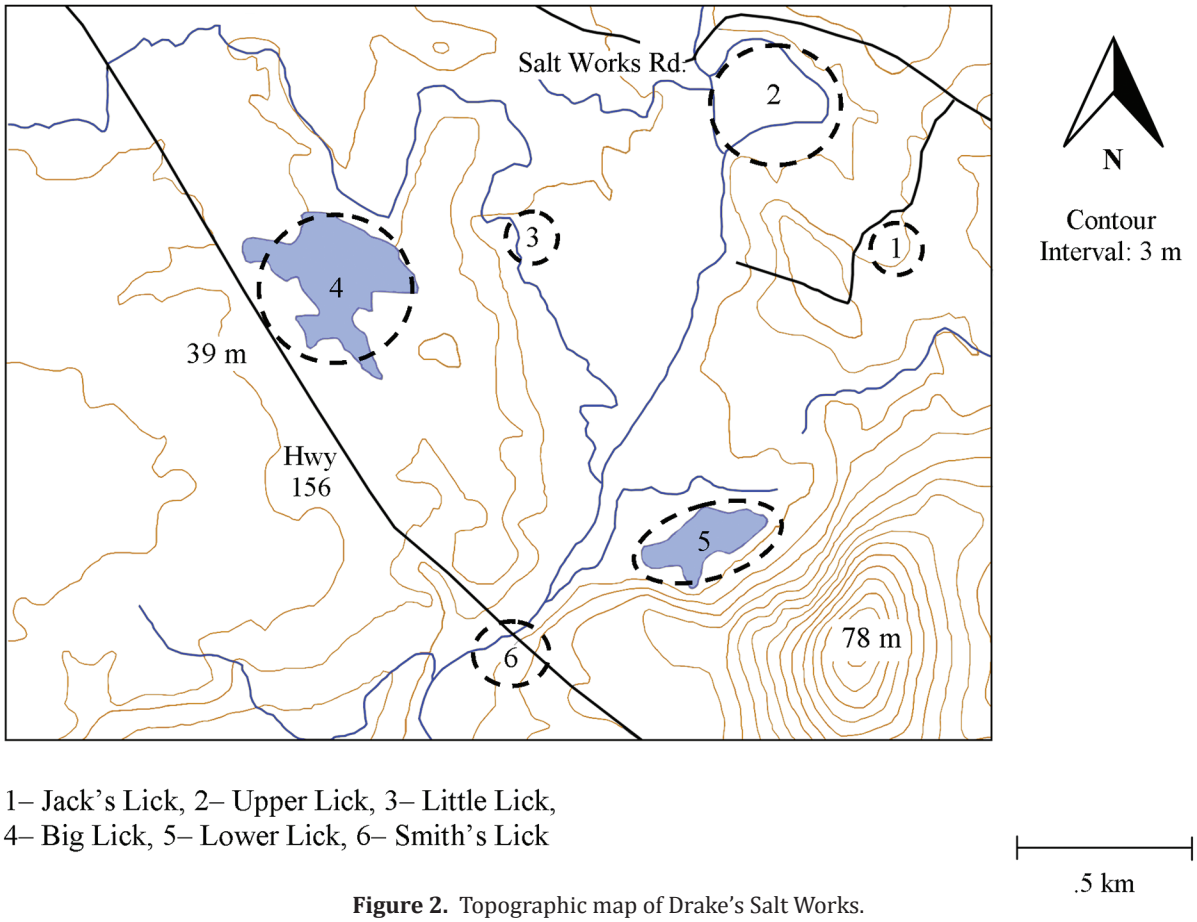


Figure 2. Topographic map of Drake's Salt Works.

Figure 3. Widdish Island on the Upper Lick Salt Flat at Drake's Salt Works.

Figure 4. The Little Lick Salt Flat at Drake's Salt Works.

Caddo Salt Making at Drake's Salt Works

Previous investigations of Caddo salt making at the Hardman saline (3CL418) in southern Arkansas and the Salt Well Slough site (41RR204) in eastern Texas, suggest that the Caddo first began producing salt in noticeable quantities around A.D. 1300/1400 (Early 1993; Kenmotsu 2001; 2005). Curiously, it appears that intensive salt production did not begin in northwestern Louisiana until sometime after A.D. 1500/1600 or slightly later (Eubanks 2014a; Girard 2006:54-69). Perhaps the delayed onset of salt making in this region implies that maize agriculture was not practiced as intensively as it was in other parts of the Caddo homeland since maize contains very little naturally occurring salt, and at least some additional dietary salt may have been physiologically necessary for maize-dependent populations (Brown 2004:41; Driver and Massey 1957; Dumas 2007). While there are many other salt flats in northwestern Louisiana that have not yet been surveyed archaeologically, Potter's Pond at Lake Bistineau and Drake's Salt Works are the only two salines known to have been utilized by the Caddo for salt production (see Figure 1). The material culture at these two salines is remarkably similar, and it would not be surprising if many of the salt production techniques were shared between the salt makers who worked at these sites. Elsewhere in the traditional Caddo homeland, a variety of vessel forms and salt production techniques were employed that differ from those used at Drake's Salt Works. At the Hardman saline, for instance, a combination of large, basin-shaped saltpans and jars were used to evaporate salt, while at the Salt Well Slough site, neck-banded and plain jars were the preferred cooking vessels (Early 1993; Kenmotsu 2005). Despite these various vessel technologies, it seems that the majority of the salt makers throughout the traditional Caddo homeland preferred evaporating their brine directly over a fire rather than placing heating stones into a briny liquid as was common at salines elsewhere

in the Southeast (e.g., Brown 1980; Bushnell 1907, 1914; Muller 1984). Thus, while many Caddo salt makers may have shared certain vessel and cooking preferences, it is important to remember that these techniques and technologies were not constant through time or space and that the reconstruction presented here is meant to apply only to Drake's Salt Works.

The Salt Makers at Drake's Salt Works

The two Caddo groups most closely associated with salt making in the area surrounding Drake's Salt Works were the Doustioni and the Natchitoches (Swanton 1911, 1942, 1946; Webb and Gregory 1978:28-29). The Doustioni, whose name is often translated as "Salt People," were known to have lived near Drake's Salt Works during the eighteenth century (Webb and Gregory 1978:28; Swanton 1942). Thus, it is possible that much of the salt produced at Drake's Salt Works was done so by this group. After the eighteenth century, however, there is no record of the Doustioni. While they may have disappeared, it is also conceivable that they intermingled or coalesced with the nearby Natchitoches. The Natchitoches were known to have lived in northwestern and west-central Louisiana, but by 1825 only a couple dozen remained in this area (Swanton 1942:21). Like the Doustioni, the Natchitoches were also known historically for their role in the salt trade (Swanton 1911:204, 1942, 1946:738), and thus, it is possible that this latter group was also making salt at Drake's Salt Works.

At the Little Lick, there is a temporary habitation zone approximately 100 m away from the salt flat on a 6 m-high hill. Although shell-tempered pottery sherds, burned earth, animal bones, and lithics were found, it is clear that this area has been heavily disturbed by American/Confederate salt production given the amount of brick found in association with these artifacts. Beneath the disturbed soil layers, however, there is little to no evidence of long-term American Indian habitation (Eubanks 2014b). Thus, these artifacts may represent the location of a temporary campsite where the Doustioni or Natchitoches lived while they were making salt (Eubanks 2013a). There are also two similar locations at the Upper Lick. One is on Widdish Island, and the other is on a natural terrace 80 m to the west. Both of these locales contained finely engraved pottery, animal bone, stone tools, and lithic flakes, but no evidence of permanent architecture. This suggests that like the Little Lick, some form of domestic activity probably occurred here on a temporary or seasonal basis (Eubanks 2014b).

Based on historic and ethnographic data, it seems that the production of salt at Drake's Salt Works would have been conducted primarily by Caddo women. It is also likely that the same individuals involved in making salt were also responsible for making the salt production equipment, which probably included woven baskets, ceramic bowls, and cloth wrapping. Since women are typically associated with the production of these materials in the ethnographic record (Swanton 1942:158, 1946:549), it is reasonable to assume that they were also responsible for making these items at Drake's Salt Works. Further insight into the issue of gender and salt making is found in a report by John Sibley, the American Indian Agent of the New Orleans Territory, who, in 1807, received news that two Nadaco Caddo women were murdered by Choctaw raiders while they were making salt.

> Three Caddos arriv'd special messengers from the Caddo chief to inform me that a party of Chactas consisting of eight persons from the great nation under a leader called *Stamelachee* had lately been at a camp of Nandacos [Nadaco] at a saline on the River Sabine where the Nandacos live, the men being out hunting and left their *women* [emphasis added] to make salt and had murdered two of the women and wounded some others, without any provocation and brought the scalps of the women through the Conchetta village on their way to the great Chacta Nation (Sibley 1922:22-23; see also Swanton 1942:82).

Although this incident occurred along the Sabine River in eastern Texas and not at Drake's Salt Works, the analogy involving female salt makers may be reasonably applied to the case at hand given the spatial, temporal, and cultural proximities between the Caddo of eastern Texas and the Caddo of northwestern Louisiana. It is also known among the Osage and Creeks that salt making and hide tanning were primarily female activities (Foreman 1932:476; Swanton 1928:386). Additionally, there is some archaeological evidence to support the argument that Caddo women were the ones primarily responsible for salt making. At many of the salines in northwestern Louisiana and throughout the Southeast, there is often a lack of hunting and knapping-related materials such as projectile points, lithic debitage, and animal bones in the middens of salt production debris. Rather, these artifacts are often not found at all or are found in nearby habitation zones (Eubanks 2014b). Since these materials are most often associated with traditionally male activities, this lends some additional support to the argument that men did not participate in salt-making activities. It is important to note, however, that while men were likely not heavily involved in the production of salt, this does not mean that they did not visit the salines or that they were not involved in its transportation or trade.

Filtering Techniques

At Drake's Salt Works today, and probably throughout its use as a Caddo salt production site, highly potent concentrations of brine rarely, if ever, pooled consistently on the ground surface. However, once successive episodes of weak brine surfaced and evaporated, visible deposits of salt could be seen left behind on the dry ground. Since the salt could not be gathered without also collecting a substantial quantity of sand and clay, it would have been necessary to filter out these soil impurities. The filtering of salty earth was a common practice in the Southeast (Brackenridge 1962:66; Brown 1980; Keslin 1964:20) and throughout the world (Adshead 1992; Connah 1996; Davison 1993; Gouletquer 1974; Lovejoy 1986; MacKinnon and Kepecs 1989; McKillop 2002; Morgan 1974:31-37; Parsons 2001; Sutton and Roberts 1968). This practice also did not escape the attention of the Gentleman of Elvas, a Portuguese officer on the De Soto expedition, who observed this technique in use by the salt makers living in the vicinity of present-day western Arkansas:

> The salt is made along by a river, which, when the water goes down, leaves it upon the sand. As they cannot gather the salt without a large mixture of sand, it is thrown together into certain baskets they have for the purpose, made large at the mouth and small at the bottom. These are set in the air on a ridge-pole; and the water being thrown on, [ceramic] vessels are placed under them wherein it may fall; then, being strained and placed on the fire, it is boiled away, leaving salt at the bottom (Elvas in Bourne 1904:136).

Filtering was also common in other regions of the world such as Africa, Asia, and Mesoamerica, and this process often had to be repeated several times before all of the impurities were removed (Andrews 1980; Connah 1996; Davison 1993; Fagan and Yellen 1968; Gouletquer 1974; Lovejoy 1986; MacKinnon and Kepecs 1989; Morgan 1974; Multhauf 1978; Nenquin 1961; Parsons 2001; Sutton and Roberts 1968). While it is unknown if the Caddo at Drake's Salt Works filtered their brine multiple times, Louis Juchereau de St. Denis, the first commandant of

Natchitoches, reported that, "The salt secured from these Indians [the Natchitoches] was whiter and purer than the salt that came from France" (Castañeda 1936:18; see also Swanton 1942:139). Given the high quality of their salt, it remains a distinct possibility that the Caddo at Drake's Salt Works filtered their brine multiple times. Barring periods of prolonged drought, the salt makers at the Upper and Little licks would not have needed to walk far for filtering water since several creeks run through or adjacent to these salt flats. A handful of bottle and jar fragments have also been recovered from Drake's Salt Works, and it is possible that one or both of these vessel forms were used to transport water from the creeks to the nearby filtering areas.

There is also some archaeological evidence to support the argument that the Caddo used woven baskets and water to filter the salt out of the soil. Underneath a thin layer of sand at the Upper and Little salt licks lies a sizeable deposit of gray clay, but this clay would have been ill-suited for pottery production given its high sand content. In an artificial mound of salt production debris at the Little Lick, however, relatively pure deposits of gray clay can be seen in the mound's soil profile. As pure clay deposits such as these have not been documented elsewhere near these salt licks, it is possible that the Caddo were using filtered clay from the salt flat to make their ceramic vessels. If they were filtering the salt out of the sand using baskets, then relatively pure deposits of clay would have been a byproduct of this process, as the heavier sand grains would have settled to the bottom of the basket leaving the smaller clay particles to accumulate separately on top.

Cooking and Vessel Technology

There are two techniques that the American Indians of North America used to evaporate crystalline salt from liquid brine: *sal solar* (sun salt) and *sal cocida* (cooked salt) (Andrews 1983:108-113). The first of these techniques involves concentrating brine in shallow pools or beds where it is evaporated using heat energy from the sun. The second method, *sal cocida*, refers to brine that is "cooked" directly over a fire or indirectly through the use of heated stones. *Sal solar* requires no fuel, but this method is often only practiced in coastal regions where there is an abundant supply of seawater, warm temperatures, a steady breeze, limited tree cover, and a predictable dry season. Salt produced via the *sal cocida* method is not bound by such limitations, and thus, *sal cocida* would have been the preferred evaporation method in non-coastal areas. In addition, *sal cocida* could produce crystalline salt in a matter of minutes or hours whereas *sal solar* may take days or even weeks (Akridge 2008). In many instances, these two methods could have been used in tandem where liquid brine was cooked until it formed a semi-solid salt slurry and then dried using solar energy. At Drake's Salt Works, it is clear that the Caddo salt makers preferred the *sal cocida* technique, as is evidenced by the tens of thousands of broken pottery sherds left behind at the Upper and Little salt licks. The overwhelming majority of these sherds belonged to thin-walled, hemispherical bowls. These bowls are tempered with shell and a mix of grog, sand, and organic material. Almost all are plain, though scrape marks, possibly resulting from salt extraction, can occasionally be seen on the interior of some of these sherds.

Throughout eastern North America, the most common vessel associated with salt making is the thick-walled, basin-shaped saltpan. At several Caddo salt production sites, especially those in southern Arkansas, saltpans were the primary pottery vessel involved in the salt making process (Early 1993). At Drake's Salt Works, and throughout northwestern Louisiana, this does not seem to have been the case, since few, if any saltpan sherds have been recovered from this area. While regional or cultural preferences played some role, the use of salt bowls over saltpans at Drake's Salt Works follows a general late prehistoric-early historic period trend seen throughout the Southeast where salt bowls or jars tend to replace saltpans (Figures 5 and 6) (Brown 1999; Eubanks and Dumas 2012; Dumas 2007:536; Kenmotsu 2005). Although it is not known for certain why the Caddo at Drake's Salt Works preferred using salt bowls, it is possible that this technology developed in response to the high demand for salt following European contact. Compared to their saltpan counterparts, salt bowls took less clay to make and would have required a shorter firing time thus allowing a large number of bowls to be produced relatively quickly. The thin walls of the salt bowls would have also permitted heat energy to be transferred more quickly from the fire to the brine compared to the thick walls of a saltpan (Akridge 2008). However, since the thin walls of the salt bowls are prone to spalling, they could seldom be used more than once before breaking. This would not have been a problem at Drake's Salt Works, since clay for additional vessels would have been readily available in mixed deposits directly beneath the salt flats.

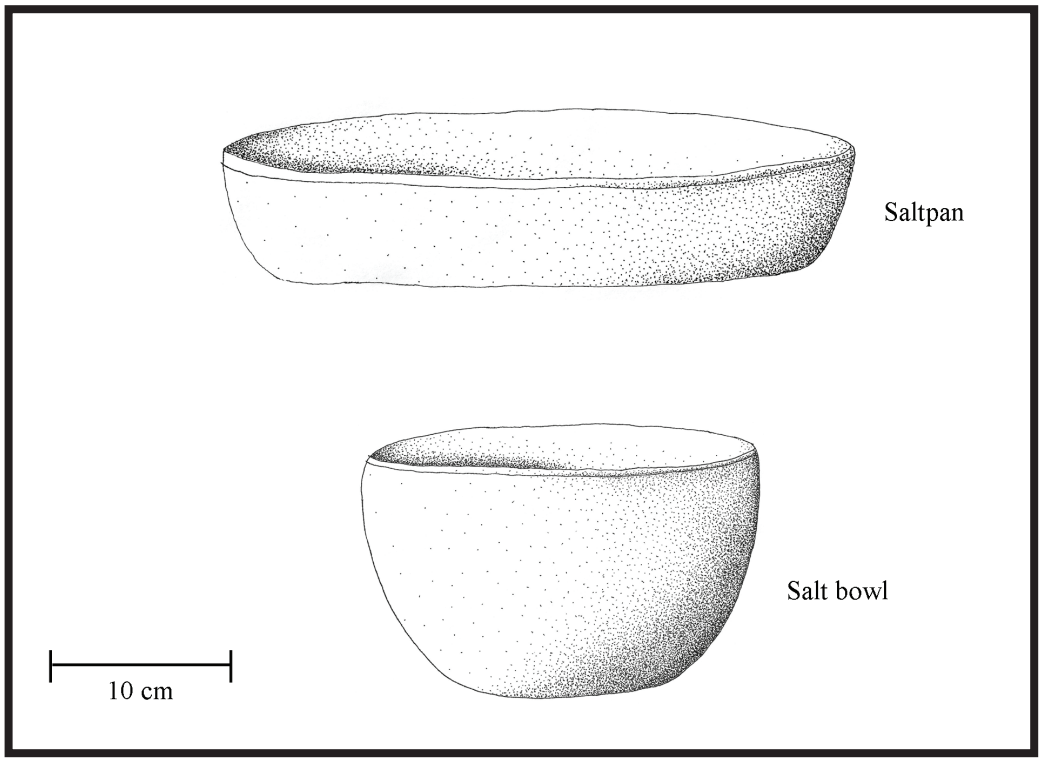


Figure 5. Sketch of a saltpan and a salt bowl.

Figure 6. Salt Bowl from the Little Lick at Drake's Salt Works.

There is a precedent elsewhere in the world for brine evaporation vessels being made and fired off-site in order to conserve wood fuel near the saline (e.g., Brown 2010, 2013), but this does not seem to have been the case at Drake's Salt Works. If fuel scarcity was a problem, then it is likely that the salt producers would have moved from lick to lick consuming the available fuel resources while leaving a series of horizontally stratified deposits. Although fuel would have certainly been a concern of the salt makers, it is unlikely that there was a serious fuel shortage at Drake's Salt Works, since most of the salt licks at this site complex do not contain evidence of Caddo salt production. The French historian Le Page Antoine Simon du Pratz (1758:307-308) also provides some insight into this issue:

> This [saline] water passes without doubt through some salt mines. It has the salt taste without having the bitterness of the water of the sea. The natives come from quite long distances to this place to hunt during the winter and to make salt here. Before the French sold them kettles *they made earthen pots on the spot* [emphasis added] for this operation. When they had enough of a load they return to their own country loaded with salt and dry meats (Swanton 1911:78).

Additional support for on-site pottery production can be seen in the salt production debris middens where mussel shells, which would have been used to temper the salt bowls, were found in association with deposits of gray potting clay.

Once enough potting clay had been collected, the salt makers may have used a combination of coiling and molding to make their salt bowls. Most of the salt bowls at Drake's Salt Works have flat bases, but it is also not uncommon for some bowls to have slightly rounded bases. The bases of the bowls appear to have been made by wrapping a clay coil around itself in a spiral pattern. Once this part of the vessel was made, standard-sized molds may have been used to help shape the rest of the vessel. The average rim diameter of these molds would have been about 20 cm with roughly 95% of the rim sherd diameters falling between 16 and 24 cm (Eubanks 2013b:21). The absence of any visible exterior vessel treatment, such as fabric or cane impressions, suggests that these vessels were molded using a material that did not leave a noticeable impression, such as wood, another pottery bowl, or hardened clay. At present, it seems more likely that wood or another salt bowl was used since no hardened clay pits or domes have been found. It is still possible that fabrics or baskets could have been used as molds, but if this was the case, then the vessel exteriors or interiors were subsequently altered in a way that smoothed over these impressions. In addition to their standardized rim diameters, the rim thickness of these vessels was fairly consistent ranging between 4 and 7 mm. Such low degrees of variability may be reflective of a standardized salt production process geared at producing large amounts of salt as quickly and efficiently as possible.

The preferred vessel technology for evaporating brine began to change sometime after sustained European contact in the early eighteenth century as the Caddo began to incorporate metal kettles obtained from the French. According to Le Page du Pratz, who is believed to have visited Drake's Salt Works, the French would sell brass kettles to the Caddo for the purposes of salt making (Le Page du Pratz 1758:307-308; see also Swanton 1911:78). While no evidence of these kettles have been found at these salt works to date, this is not surprising since most, if not all, of these containers would have been recycled or repurposed in some manner (e.g., Brain 1979:164; Quimby 1968:72; Woolworth 1975:91).

Very few examples of fire-altered stone have been recovered from Drake's Salt Works. This, along with the abundance of charred wood remains suggests that the brine was heated by placing the salt production vessels directly over a fire. Additional support for direct heating over indirect heating is also found in the above account from the Gentleman of Elvas who observed the Caddo evaporating liquid brine directly over a fire (Bourne 1904:136; Swanton 1946:301). The heating process appears to have been carried out in open-air hearths on or around elevated areas adjacent to the salt flat (Figure 7). In addition to allowing the salt makers to remain at the site during brief periods of rain, these elevated areas would have also been a good source of wood for shade and fuel since trees are rarely able to grow on the salt flat itself due to the high salt content of the soil. At the Upper Lick, the majority of the salt production debris is concentrated on Widdish Island, a 2 m-high rise in the salt flat (see Figure 3), while at the Little Lick, a 1 m-high deliberately constructed rise on the edge of the salt flat composed primarily of salt production debris was utilized (Figure 8).

Figure 7. A bisected open air hearth on the Little Lick Salt Flat.

Figure 8. Profile cut from the mound of salt production debris at the Little Lick Salt Flat.

Transport and Trade

After the salt was evaporated out of liquid brine, the producers would have needed to dry the salt cakes before they could be stored or transported. There are several ways that this could have been achieved. First, the salt may have been left in the salt bowl over a fire until it was completely dry. This method probably would have resulted in dried salt solidifying on the interior walls of the vessels, meaning that the vessels would have to be scraped out or broken open intentionally to remove the salt. The high vessel breakage rate and the occasional scrape marks found on the interiors of salt bowls lend some support to this hypothesis. In addition, given the high spalling rate associated with evaporating salt water, it may have been the case that each bowl could only be used once anyway (Kenmotsu 2005:32).

It is also possible that the *sal solar* technique was used for this final stage of production. *Sal solar* would have been more fuel efficient, but there is little archaeological or historical evidence suggesting that this technique was used. If it was used, then the salt makers may have simply left the salt bowls with their partially-evaporated salt slurries out in the sun. They could have also laid the semi-solid salt cakes out to dry on pieces of fabric. This latter method would presumably have been advantageous in that once the salt cakes were dry they could easily be wrapped in the same fabric and prepared for transport or storage.

In the late 1680s, Henri Joutel, a survivor of René-Robert Cavelier Sieur de La Salle's failed attempt to establish a colony at the mouth of the Mississippi River, reported that he encountered two Caddo traders on their way to the Quapaw to sell bows, arrows, and salt. He described the salt cakes as "little loaves…weighing about two to three pounds apiece" (Swanton 1942:138-139). These traders claimed to have gotten the salt from the Tunica, which raises the possibility that non-Caddo groups were involved in salt production in northwestern Louisiana or at Drake's Salt Works. However, it could also be the case that the Tunica obtained this salt from one Caddo group and then traded it to a different group of Caddo traders. Regardless of if the Tunica made the salt themselves or traded for it, if Joutel's observation characterized a typical unit of trade for salt, then the salt makers at Drake's Salt Works may have also been making similarly sized salt cakes. Given the limited range of variability exhibited by the salt bowls, it would have been relatively easy for the Drake's Salt Works salt makers to produce a standard, two-three pound salt cake.

In addition to Joutel's observation, Jean-Baptiste Le Moyne, Sieur de Bienville reported in March of 1700 that he happened upon a small group of Ouachita with "several canoes loaded with salt" to sell to the Taensa and that several days later he also encountered "six Nadchitos on their way to the Coroas to sell salt" (McWilliams 1981:146-149). In June of 1716, Bienville also reported seeing eight Natchitoches traders in a pirogue filled with salt. From these examples, it may be assumed that small groups of traders, ranging in size from two to less than a dozen people, were responsible for selling and trading salt. Many of the individuals selling salt were not involved directly in the salt making process, as is evidenced by Joutel's account of the Caddo traders who

were selling salt acquired from the Tunica. However, it is possible that some salt traders may have also been salt makers or related to the individuals involved in this process. Although difficult to demonstrate given the information at hand, if the Caddo women were in charge of making salt, then responsibility for transporting and trading the salt cakes may have fallen to their male relatives.

In the early eighteenth century, the French explorer Jean Baptiste Bénard de la Harpe observed that the Caddo were capable of producing and trading relatively large quantities of salt. In 1718, la Harpe was commissioned to establish a trading post among the Kadohadacho near present-day Texarkana, Texas. Later, in May of 1719, he sent two of his soldiers out to purchase salt from a saline located three days' journey away by stream. These soldiers returned to la Harpe's trading post with 200 lbs of salt (Margry 1875-1886:272; Swanton 1942:139-140). The Spanish missionary Fray Juan Agustín Morfi also provides some insight into how much salt a saline was capable of producing. In September of 1721 he reported:

> The Indians informed him [Marquis of San Miguel de Aguayo, the Spanish governor of Coahuila and Texas] of a saline located fifteen leagues from the fort [Los Adaes]. A lieutenant was sent with twenty men to reconnoiter it, who brought back twenty-five mules laden with salt ore, of such high grade that it yielded fifty per cent; that is, one arroba of salt ore yields half an arroba of excellent salt (Morfi 1935:217-219; see also Swanton 1942:64).

From this account, an estimate of the amount of salt that the Caddo traded to the Spanish can be made. Conservatively, if each mule only carried two loaves of salt and if each loaf weighed two to three pounds, as Joutel suggested, then at least 100-150 lbs of salt were traded to the Spanish at the Los Adaes presido.

The quantities of salt described in the above accounts suggest that the Caddo salt makers may have stored loaves of salt at or near a saline. In order to keep an eye on their salt stores, the salt makers would have had to remain at the saline until their reserves were emptied. Alternately, they could have carried the salt with them whenever they left the saline for extended periods of time, since it was apparently not uncommon for salines to be raided (Sibley 1922:22-23).

After the establishment of Natchitoches in 1714, the Caddo at Drake's Salt Works would have been a short journey from a major French trading post (see Figure 1). It is also no coincidence that Natchitoches, Louisiana's oldest permanent settlement, is located so close to Drake's Salt Works. This fact did not escape St. Denis, who noted it was the French desire for salt that helped to bring these two groups together (Castañeda 1936:18). Jacques de la Chaise, a French royal commissioner, also provides some insight into the general outlook on salt in Louisiana when he reported that, "Salt is extremely rare here. Private persons sell it for as much as sixty sous [approximately $1.25 in current U.S. dollars] a pound" (Rowland and Sanders 1929:314).

The arrival of a market in Natchitoches would have almost certainly resulted in greater profits for the Caddo salt makers, given the proximity of Drake's Salt Works to this trading post.

Traveling by canoe, it would have taken less than an afternoon for the Caddo salt traders to reach the confluence of Saline Bayou with the Red River, where they could then trade their salt to the French. Given that glass trade beads, kaolin pipe stems, gunflints, European pottery, and salt kettles have either been found at the salines or were recorded by European explorers, it is reasonable to infer that these items may have been traded to the salt makers in exchange for salt (Le Page du Pratz 1758:307-308; Eubanks 2013a; Gregory 1973:257; Swanton 1946:301-302).

Antebellum and Civil War Use of Drake's Salt Works

The Caddo continued to make salt at Drake's Salt Works until sometime between the late eighteenth century and the early nineteenth century (Phillips 1962; Sibley 1805:56; Veatch 1902:55-56). In April of 1805, the American Indian Agent John Sibley reported to General Dearborn, the Secretary of War, that "two old men" were making six bushels of salt each day from a dozen salt wells at Drake's Salt Works (Sibley 1805:49-65; Veatch 1902:55-56). By 1816, the saline had acquired the named "Postlewait's Salt Works" after its current owner (Phillips 1962:33). In the early 1840s, Reuben Drake, who by this time owned much of the site, excavated numerous wood-lined salt wells. One of these wells was drilled to a depth of 1011 ft. and was capable of producing 18 to 20 gallons of brine a minute (Hilgard 1883). The brine from wells such as this was often transported away from the salt flat or pumped into a trench where it was transported to a boiling furnace. Some furnaces contained rectangular or circular salt kettles, while others housed a cylindrical metal boiler that was split in half and mounded on each side with brick and/or ferruginous sandstone. The intensity of salt production increased dramatically at Drake's Salt Works during the Civil War, especially after the Union Blockade of New Orleans in 1862. Once the port of New Orleans was reopened, however, intensive salt production ceased as this commodity could no longer be produced at a cost that would permit it to be competitive on a regional or national market.

An Imagined Day in the Life of the Caddo Salt Makers at Drake's Salt Works

It was early spring, the height of the salt making season. Several days ago, the French commandant at the Natchitoches trading post had commissioned a group of six Doustioni women to make 100 lbs. of salt in exchange for money and a myriad of trade goods including beaded necklaces, smoking pipes, and a brass kettle. Following this arrangement, the Doustioni salt makers had been hard at work, and today, they needed only to make a dozen salt cakes before the arrival of the French.

Upon leaving their camp in the early hours of the morning, the women gathered their woven baskets and loaded them up with jars, bottles, pieces of fabric, and stacks of pottery bowls. They did not have to walk far as their camp was located little more than a stone's throw from the salt flat. Once they reached their workplace and emptied their baskets, the women went out to the center of the flat and began to scrape up small piles of salty soil. After twelve piles were made, they were scooped into the woven baskets and carried to the forest's edge just beside the salt flat. Three of the women tied these baskets to wooden poles and tree limbs and dug small holes in the

ground beneath the suspended baskets. The bases of the ceramic bowls were then placed into these depressions so that they would not tip over. Meanwhile, the other women collected water from the creek using jars and bottles. These women then poured this water into the woven baskets and began filtering the salt out of the soil. In order to ensure that their salt was free of impurities, they filtered the liquid brine through the baskets several times.

Next, most of the women carried the ceramic bowls away from the wet filtering area to a dry, open-air hearth on a mound near the edge of the salt flat. With wood that they had gathered the previous day, they started a fire in the hearth and began to heat the brine. Back at the filtering area, the remaining women emptied the soil from the baskets. The filtering process had not only removed salt from the soil, it had also separated and arranged soil particles by size and weight. The larger and heavier sand grains settled to the bottom of the baskets while the smaller clay granules were left on top. The left over sand was taken to an elevated, earthen platform on the edge of the salt flat to shore up an area that had eroded during last year's flood. The clay, meanwhile, was set aside to make more ceramic bowls. Although the bowls were not aesthetically pleasing, they were functional and easy to coil, especially when using an already-fired ceramic bowl for a mold. The resulting standardized bowls had the effect of producing a standardized salt cake, which helped the women judge the weight and value of their salt.

After the liquid brine evaporated over the fire, the salt cakes, weighing about two to three pounds each, were removed from their ceramic containers. Some of the salt had crusted onto the vessels walls and to get it out the vessels had to be scraped or broken open. The women did not mind breaking these vessels open to remove the salt, especially the ones that had started to spall or break apart during the evaporation process. Most of the salt cakes were completely dry, but a few were not. The latter were laid out on pieces of fabric in the salt flat so that they could finish drying. When the drying was finished, the women tied up each salt cake using a cord and piece of cloth.

As the workday neared its end, the French soldiers that had been dispatched from the nearby Natchitoches trading post reached the salt lick. Although the salt was a rare and important commodity, valued at sixty sous a pound, the Caddo salt traders agreed to accept slightly less, in exchange for some additional trade goods. After the terms of the exchange were agreed upon, the French soldiers loaded the salt cakes into their canoes and were home before nightfall.

Acknowledgements

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[1] In the fall of 2011 and 2012, the United States Forest Service sponsored two archaeological projects that allowed dozens of volunteers from across the country to conduct excavations at Drake's Salt Works. These projects, along with the excavations conducted by the University of Alabama in the fall of 2013 and the spring of 2014, are responsible for most of the data recovered from the Upper and Little salt licks.

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Report on the 56th Caddo Conference and 21st East Texas Archeological Conference

Timothy K. Perttula and Tom Guderjan

The joint 56th Caddo Conference and 21st East Texas Archeological Conference was held March 28-29, 2014, at the University Center on the campus of the University of Texas at Tyler. The conference was organized by Dr. Tom Guderjan of the University of Texas at Tyler and Dr. Timothy K. Perttula of Archeological & Environmental Consultants, LLC, with the assistance of Dr. Cory Sills (University of Texas at Tyler), Mark Walters, and Patti Haskins.

A wide variety of entities helped sponsor the 2014 Conference. These included Humanities Texas, Ben E. Keith Beverages, Archeological & Environmental Consultants, LLC, Maya Research program, Beta Analytic, Inc., Department of Social and Cultural Analysis, Stephen F. Austin State University, Social Sciences Research Center, Department of Social Sciences, University of Texas at Tyler, College of Arts and Sciences, University of Texas at Tyler, Gregg County Historical Foundation, East Texas Archeological Society, Friends of Northeast Texas Archaeology, and the Deep East Texas Archeological Society. Travel funds for the Caddo Culture Club were provided by the University of Texas at Tyler.

A total of 110 people attended the Conference. In addition to 19 individual presentations and eight posters, there was a film entitled "The Spiro Story" shown on March 28th. The individual presentations were diverse and wide-ranging, including presentations on excavations at the Spiro site; excavations at a Caddo community in the Ouachita Mountains in southwest Arkansas; a reconsideration of strontium isotopes in Caddo human remains from the Crenshaw site (3MI6); Caddo iconography; solar alignments of mounds at the George C. Davis site (41CE19); Caddo salt making; Titus phase community organization in the upper Big Cypress Creek basin in East Texas; trade between Caddo peoples and peoples living on the East Fork of the Trinity River; CRHR: Archaeology; Oral History and Caddo history; and Caddo language classes.

On the morning of March 29th, there was a 40 minute Current Research in Caddo Archeology session, while the afternoon had an interesting and thought-provoking round table discussion coordinated by Jeffrey S. Girard and Ross C. Fields on "How do we recognize and study past communities in the Caddo area?" Hopefully future Caddo Conferences will include more current research and round table discussions in the program. The Caddo Conference Organization business meeting was held on the afternoon of March 28th.

The Caddo Culture Club danced twice as part of the Caddo Conference. Both dances were held at the downtown Tyler Arts and Crafts Fair in Bergfeld Park (Figure 1).

Figure 1. Caddo Culture Club members at Bergfeld Park.

PROGRAM AND ABSTRACTS FOR THE 56TH CADDO CONFERENCE AND THE 21ST EAST TEXAS ARCHEOLOGICAL CONFERENCE

PROGRAM

Friday, March 28th

9-9:10 A.M. Introduction to the Caddo Conference and the East Texas Archeological Conference

9 A.M.-4 P.M. Posters

9:10-9:30 A.M. Using Google Earth as GIS: A Look at Caddo Sites in Southeastern Oklahoma, *by Robert L. Brooks (Oklahoma Archeological Survey, Norman, Oklahoma)*

9:30-9:50 A.M. 2013 Excavations at Spiro, *by Patrick C. Livingood (University of Oklahoma, Norman, Oklahoma), Scott W. Hammerstedt (Oklahoma Archeological Survey, Norman, Oklahoma), Jami J. Lockhart (Arkansas Archeological Survey, Fayetteville, Arkansas), Tim Mulvihill (Arkansas Archeological Survey, Fayetteville, Arkansas), Amanda L. Regnier (Oklahoma Archeological Survey, Norman, Oklahoma), George Sabo III (Arkansas Archeological Survey, Fayetteville, Arkansas), and John Samuelsen (Arkansas Archeological Survey, Fayetteville, Arkansas)*

9:50-10:30 A.M. "The Spiro Story" Film and Introduction by Elsbeth L. Dowd

10:30-10:50 A.M. Break

10:50-11:10 A.M. Caddo Connections to the Iconography of the Eastern Woodlands, *by Eloise Frances Gadus (Prewitt and Associates, Inc., Austin, Texas)*

11:10-11:30 A.M. What is a Picture Worth? Soule's Caddo Homestead and Visions of Ancient Caddo Life, *by Ann M. Early (Arkansas Archeological Survey, Fayetteville, Arkansas)*

11:30 A.M.-1:00 P.M. Lunch

1:00-1:20 P.M. Archaeology, Culture, and K-12 Education, *by Sheila Richmond (Creole Heritage Center, Natchitoches, Louisiana)*

1:20-1:40 P.M. Oral History is the traditional form of Caddo history: The poems I have created from Caddo oral history preserve traditions for future generations, *by Guyneth Bedoka Cardwell (Kadohadacho Historical Society)*

1:40-2:00 P.M. Information derived from Burials from the Rowland Clark Site (41RR77), Red River County, Texas, *by Jesse Todd (AJC Environmental LLC, Carrollton, Texas)*

2:00-2:40 P.M. Break

2:40-3:00 P.M. A Possible Mississippian Ceramic Whistle, *by Mark Howell (Winterville Mounds State Park and Museum, Greenville, Mississippi) and James A. Rees, Jr. (Vice President, Arkansas Archeological Society and Research Associate at The University of Arkansas Museum)*

3:00-3:20 P.M. Resurrecting Old Pattonia: Uncovering the Lifeways of a 19th Century Shipping Port Community, *by Zachary M. Overfield (Perennial Environmental, Austin, Texas)*

3:20-3:40 P.M. The George C. Davis Mound Site: A Celestially-Oriented Site Lacking Multi-Mound Solar Alignments, *by Mark J. Richard (Louisiana Archaeological Society, Lafayette, Louisiana)*

4 P.M. Caddo Conference Organization Board Meeting

Saturday, March 29th

9 A.M.-4 P.M. Posters

9 A.M. Current Research in Caddo Archeology Session

9:00-9:10 A.M. Jeffrey S. Girard (Northwestern State University of Louisiana, Natchitoches, Louisiana), Current Research at the Mounds Plantation Site

9:10-9:20 A. M. Ross C. Fields (Prewitt and Associates, Inc., Austin, Texas), Current Research at the Sabine Mine

9:20-9:30 A. M. Robert Z. Selden, Jr. (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas) and Michael Dee (School of Archaeology, University of Oxford, Oxford, England) On Caddo Corn: Using Chronometric Hygiene and Bayesian Statistics to Model the Entrance, Preservation, and Recovery of *Zea mays* within the Ancestral Caddo Territory

9:30-9:40 A.M. Tom Middlebrook, Current Research in Nacogdoches County, Texas

Presentations

9:40-10:10 A.M. Da?kaninnih hayuh: The OKC 2013-14 Caddo Language Class, *by Alaina Poole (Caddo Tribal Member), Tracy Newkumet Burrows (Caddo Tribal Member), Genny Deer (Caddo Tribal Member), Donna Williams (Caddo Tribal Member), Yonavea Hawkins (Caddo Tribal Member), Robin Williams (Caddo Tribal Member), Marion Ramirez (Caddo Tribal Member), Joshua Calhoun (Caddo Tribal Member), Jennifer Wilson (Caddo Tribal Member), Jeri Redcorn (Caddo Tribal Member), Tim Dowd (Southmoore High School), and Elsbeth Dowd (Sam Noble Museum, University of Oklahoma, Norman, Oklahoma)*

10:10 A.M.-10:30 A.M. A Reconstruction of the Caddo Salt Making Process at Drake's Salt Works, *by Paul N. Eubanks (Dept. of Anthropology, University of Alabama, Tuscaloosa, Alabama)*

10:30-10:50 A.M. Break

10:50-11:10 A.M. Hearing and Hunting: Congenital Defects in an early Late Archaic male, *by Catrina Whitley (Bioarchaeology Support, Midlothian, Texas)*

11:10-11:30 A.M. New Evidence for Ceramic Trade Between the Late Prehistoric Occupants of the East Fork and the Caddo Peoples, *by Wilson W. Crook, III (Houston Archeological Society, Kingwood, Texas)*

11:30 A.M.-1:00 P.M. Lunch

1:00-1:20 P.M. An Introduction to CRHR:ARCHAEOLOGY, *by Robert Z. Selden, Jr. (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas) and Dillon M. Wackerman (Center for Digital Scholarship, Stephen F. Austin State University, Nacogdoches, Texas)*

1:20-1:40 P.M. French Colonial Pottery recovered from Recent Excavations in Northwest Louisiana and Deep East Texas, *by Tom Middlebrook, George Avery, and Morris K. Jackson*

1:40-2:00 P.M. A Caddo Community in the Ouachita Mountains, *by Mary Beth Trubitt (Arkansas Archeological Survey, Arkadelphia, Arkansas), Meeks Etchieson (U.S.D.A. Forest Service, Hot Springs, Arkansas), Leslie L. Bush (Macrobotanical Analysis, Manchaca, Texas), and Vanessa N. Hanvey (Arkansas Archeological Survey, Arkadelphia, Arkansas)*

2:00-2:20 P.M. A Reanalysis of Strontium Isotopes from the Crenshaw Site: Implications on Caddo Interregional Warfare, *by John R. Samuelsen (Arkansas Archeological Survey, Fayetteville, Arkansas)*

2:20-2:40 P.M. Titus Phase Caddo Community Organization in the Upper Big Cypress Creek Basin of Texas: The Evidence from the Tankersley Creek Sites, *by Ross C. Fields (Prewitt and Associates, Inc., Austin, Texas)*

2:40-3:00 P.M. Break

3-4+ P.M. Round Table Discussion

- How do we recognize and study past communities in the Caddo area, discussion coordinated by Jeffrey S. Girard and Ross C. Fields. Panel: Ross C. Fields, Jeffrey S. Girard, Scott Hammerstedt, Amanda Regnier, John Samuelsen, and Mary Beth Trubitt

ROUND TABLE DISCUSSIONS

Discussion of Caddo Communities
Discussion Coordinators: Jeff Girard and Ross Fields
Roundtable Topic: How do we recognize and study past communities in the Caddo Area?

Background: Communities can be viewed as settlements or groups of settlements organized to coordinate social interaction, subsistence and technological production, exchange, facility construction, defense, ritual, and other activities. Communities can be based on factors such as allegiances to leaders, rituals, important events or commemorations of such (histories), religion and symbolic systems, kinship, and notions of common ancestry (ethnicity).Some recent studies consider notions of social identity as primary for defining communities. Important to the consideration of Caddo communities are notions of spatial contiguity, spatial boundaries, and the presence of central places, although communities also can involve networks of identity and communication that may lack spatial contiguity, connecting settlements in different geographical areas and creating divisions at local spatial levels. This roundtable will discuss (1) expectations regarding the nature and spatial distributions of material culture in the archaeological record in respect to notions of community; and (2) how researchers define and interpret communities in different parts of the Caddo Area.

Issues for Discussion (among others):

- What kinds of archaeological traits do we expect to cluster in geographically circumscribed areas (and why)? How do we recognize networks of communication that lack spatial contiguity?
- To what degree did landscape conditions (uplands, major floodplains) and subsistence practices influence the nature and spatial configurations of communities?
- Were there cosmic or other cultural structural principles that may have factored in the ways that communities were defined and organized?
- Did Caddo communities constitute relatively stable, functionally integrated entities likely to leave archaeological signatures reflected well by traditional archaeological systematics? Or were communities unstable, being constantly subject to the whims of human agency and unpredictable events, resulting in archaeological patterns that are not in accord with conventional frameworks used to organize data. What are the implications for archaeological taxonomies, and for use of historic or ethnographic models (e.g., Hasinai or Teran map)?
- How variable were communities across the Caddo Area and for different periods of time?
- To what degree were Caddo community organizations similar to those in other areas in the Southeast?

ABSTRACTS

Using Google Earth as GIS: A Look at Caddo Sites in Southeastern Oklahoma, ***by Robert L. Brooks (Oklahoma Archeological Survey, Norman, Oklahoma)***

Google Earth is widely used as a map reference tool in archaeology and other sciences as well as for recreational applications. However, its capabilities to be more than a mapping tool have not been widely applied. This presentation explores use of Google Earth as an inexpensive alternative to ARCGIS. A model dataset using Caddo sites in southeastern Oklahoma has been developed to demonstrate Google Earth's GIS capabilities. Methods for incorporating archaeological data in to Google Earth are presented as well as their management and research potential.

Oral History is the traditional form of Caddo history: The poems I have created from Caddo oral history preserve traditions for future generations, ***by Guyneth Bedoka Cardwell (Kadohadacho Historical Society)***

A history is essential to identity, which is essential for a future. The only people in the world who can adequately and appropriately represent the Caddo past are the Caddo people. As opposed to written history which is recorded, oral history is a history that is lived. An oral history will tell stories that the written record usually does not. It is dangerous and a sign of powerlessness to let an outsider tell you your history or culture. Oral history is as viable as any other history and it is more personal and meaningful to the Caddo. The poems I have created are from the voices of Caddo people. I am of the Fort Cobb Caddos who lived by the fort in the early days. We were called the "kee whut nah sundah people," those who lived by the fort or soldiers. My poems tell about the "kee whut nah sundah people" and their life journey. I have read my poems for the conference before and now I am going to introduce more characters that lived the Caddo life style in the 1800s and early 1900s, people that were of the "kee whut nah sundah people."

New Evidence for Ceramic Trade Between the Late Prehistoric Occupants of the East Fork and the Caddo Peoples, ***by Wilson W. Crook, III (Houston Archeological Society, Kingwood, Texas)***

Recently three near complete Caddo ceramic vessels have been identified from Late Prehistoric sites along the East Fork of the Trinity and its tributaries. These include a small Killough Pinched jar from the Upper Farmersville site (41COL34), a Foster Trailed-Incised jar from the Sister Grove Creek site (41COL36), and a Maydelle Incised vessel from the Lower Rockwall site (41RW1). The former two are the result of recent discoveries by the speaker; the latter was found as a collection of 34 sherds by a local avocational archeologist in the 1960s and only recently has been partially reconstructed. All three of these ceramics have well-established origins in either East Texas along the Red River or from the drainage systems of the Upper Neches, Sabine, and Sulphur rivers. The discovery of specialized woodworking tools in East Fork sites (the "East Fork Biface") supports the idea that bois d'arc is the probable trade material for the Caddo ceramics. This presentation summarizes the finds and characteristics of each vessel and puts on record further evidence of contact between the Caddo and Late Prehistoric populations living in the Upper Trinity River basin.

"The Spiro Story," ***introduced by Elsbeth L. Dowd (Sam Noble Museum, University of Oklahoma, Norman, Oklahoma)***

This film was produced in the 1950s by the University of Oklahoma and KOCO-TV. It includes original

scenes from the WPA-era excavations at Spiro Mounds and other sites, footage of artifact processing back in the lab, and historic reenactments. A period piece, it is a wonderful example of public outreach by the archaeological community in the mid-twentieth century.

What is a Picture Worth? Soule's Caddo Homestead and Visions of Ancient Caddo Life, ***by Ann M. Early (Arkansas Archeological Survey, Fayetteville, Arkansas)***

Will Soule's photographs of a Caddo family taken in western Oklahoma have been iconic images used in many research situations by historians and archeologists. This paper is part of a critical evaluation of the photograph, the photographer, and the uses and misuses that scholars have imposed on the images. Uncritical assumptions about the images may have obscured their content and message.

A Reconstruction of the Caddo Salt Making Process at Drake's Salt Works, ***by Paul N. Eubanks (Dept. of Anthropology, University of Alabama, Tuscaloosa, Alabama)***

The Caddo salt makers at the Drake's Salt Works Site complex played a critical role in the production of salt during the early contact period in northwestern Louisiana. Not only was this mineral used to season food, it would have also been important in the preparation of hides and the preservation of meat. Using archaeological data from recent excavations, as well as the historic record, this paper attempts to provide a reconstruction of the salt making process at Drake's Salt Works. This process began by filtering salt-impregnated soil using water from nearby streams and boiling the resulting liquid brine in a thin-walled, standardized bowl. The salt bowls appear to have been made on site using clay deposits found beneath the salt flats. Once the liquid brine had evaporated leaving behind the solid salt, the salt cakes were removed and prepared for short-term storage or traded to the French, Spanish, or other American Indian groups without direct access to this commodity.

Titus Phase Caddo Community Organization in the Upper Big Cypress Creek Basin of Texas: The Evidence from the Tankersley Creek Sites, ***by Ross C. Fields (Prewitt and Associates, Inc., Austin, Texas)***

This paper uses data generated by testing and data recovery excavations at sites along the U.S. Highway 271 Mount Pleasant Relief Route in Titus County, Texas, to look at the issue of Titus phase Caddo community organization on Tankersley Creek in the upper part of the Big Cypress Creek basin. Reconstructing some aspects of this community is straightforward, but others are not. There likely are multiple reasons for this, including comparative data that are spotty in terms of both quality and geographic coverage and the difficulty of identifying community-specific identifiers in the material culture that remains. Perhaps just as limiting, though, is the possibility that the models of Caddo settlement patterning and sociopolitical organization used to help interpret the evidence do not do justice to the complexity that characterizes the groups who occupied the region.

Caddo Connections to the Iconography of the Eastern Woodlands, ***by Eloise Frances Gadus (Prewitt and Associates, Inc., Austin, Texas)***

Recent investigations have shown that Caddo iconography can be linked to the Mississippian ideologies. But, there are also vestiges in Caddo ceramic motifs of an older ideology that became widespread during the Woodland period. This older ideology is represented by a little-recognized motif identified for the Ohio Hopewell. It is an iconic symbol for the Hopewell that can stand-alone or is associated with a composite

creature with characteristics of bears, birds, pumas, and serpents. The motif occurs in the iconographic repertoire of Native groups from the middle Mississippi valley to the Gulf coast, and to the Caddo homeland in East Texas.

A Possible Mississippian Ceramic Whistle, ***by Mark Howell (Winterville Mounds State Park and Museum, Greenville, Mississippi) and James A. Rees, Jr. (Vice President, Arkansas Archeological Society and Research Associate at The University of Arkansas Museum)***

In 1963 private collector and amateur archeologist T. H. Robertson wrote that he salvaged two small well-made and largely intact pottery vessels from a disturbed burial at Noble Lake, a protohistoric site south of Pine Bluff, Arkansas. One of these vessels was a small shell-tempered globe, 6.5 cm in diameter, with a Hudson Engraved design on its exterior and two small openings in its top. Robinson did not speculate about the function of this unusual vessel, but in a 1995 article by John House, it was tentatively identified as a "seed jar." The vessel eventually made its way into the collections of The Museum of the Red River in Idabel, Oklahoma, where it was identified as a ceramic whistle by ethnomusicologist Richard Payne. Our paper revisits Payne's identification by testing the vessel's capabilities as a sound-maker using various acoustical analysis procedures. We will also discuss what the presence of this rare artifact might reveal about the interactions of various peoples in the Trans-Mississippi South during the protohistoric period.

2013 Excavations at Spiro, ***by Patrick C. Livingood (University of Oklahoma, Norman, Oklahoma), Scott W. Hammerstedt (Oklahoma Archeological Survey, Norman, Oklahoma), Jami J. Lockhart (Arkansas Archeological Survey, Fayetteville, Arkansas), Tim Mulvihill (Arkansas Archeological Survey, Fayetteville, Arkansas), Amanda L. Regnier (Oklahoma Archeological Survey, Norman, Oklahoma), George Sabo III (Arkansas Archeological Survey, Fayetteville), and John Samuelsen (Arkansas Archeological Survey, Fayetteville, Arkansas)***

In 2013 researchers from the Arkansas Archeological Survey, Oklahoma Archeological Survey, and University of Oklahoma conducted the first professional excavations at the Spiro site in over three decades. This fieldwork was promoted by remote sensing evidence that showed that likely prehistoric structures were in danger of being lost due to erosion. This paper will present data from the first of several planned excavations at the site and discuss how these are changing our interpretation of the site.

French Colonial Pottery recovered from Recent Excavations in Northwest Louisiana and Deep East Texas, ***by Tom Middlebrook, George Avery, and Morris K. Jackson***

The piney woods area of El Camino Real de los Tejas, spanning from Natchitoches, Louisiana to Crockett, Texas is an area characterized by multi-cultural interaction under generally peaceful conditions during the middle to late 18th century; this would change after the Louisiana Purchase of 1803. The French in Louisiana had established economic and social relations with the Spanish and various American Indian groups in Texas during the 18th century and identifying French pottery in the piney woods area of El Camino Real de los Tejas allows an examination of the nature of the interaction between the various European and American Indian groups. French colonial pottery recovered from 18th century sites in Northwest Louisiana (Natchitoches Parish) and Deep East Texas (Nacogdoches County) excavated within the last 10 years will be discussed and interpreted.

Resurrecting Old Pattonia: Uncovering the Lifeways of a 19th Century Shipping Port Community, *by Zachary M. Overfield (Perennial Environmental, Austin, Texas)*

An East Texas steamboat landing community, known as Pattonia, operated from 1843 to the late 19th century. Here I attempt to identify what socioeconomic stratification and consumerism on the landscape meant for the daily lives of Pattonia's past occupants. In order to address this question, I interpret the architectural features that once stood at Pattonia and their spatial organization. Additionally, I conduct a ceramic analysis of two household assemblages with unknown occupants in order to determine their relative socioeconomic status and reconstruct the social landscape of Pattonia. These methods enable a greater understanding of the unique historical and social significance of Pattonia. The Pattonia landscape was a place of struggle and perseverance, and was ultimately abandoned as it failed to endure beyond its entrepreneurial foundations.

Da?kaninnih hayuh: The OKC 2013-14 Caddo Language Class, ***by Alaina Poole (Caddo Tribal Member), Tracy Newkumet Burrows (Caddo Tribal Member), Genny Deer (Caddo Tribal Member), Donna Williams (Caddo Tribal Member), Yonavea Hawkins (Caddo Tribal Member), Robin Williams (Caddo Tribal Member), Marion Ramirez (Caddo Tribal Member), Joshua Calhoun (Caddo Tribal Member), Jennifer Wilson (Caddo Tribal Member), Jeri Redcorn (Caddo Tribal Member), Tim Dowd (Southmoore High School), and Elsbeth Dowd (Sam Noble Museum, University of Oklahoma, Norman, Oklahoma)*** **FOR SATURDAY, 30 minutes**

Caddo language is alive in OKC! (Along with basketball - Da?kaninnih hayuh translates as Thunder Up.) The language class that began last year in Norman has been meeting once a week this year in Oklahoma City, where we hoped to attract new participants. We have delved into grammar, continued to sing, and have acquired access to diverse archival resources that are very useful to our efforts. We would like to take this time to share some of what we have learned.

The George C. Davis Mound Site: A Celestially-Oriented Site Lacking Multi-Mound Solar Alignments, *by Mark J. Richard (Louisiana Archaeological Society, Lafayette, Louisiana)*

The George C. Davis site (41CE19) provides an example of a prehistoric mound site with no mound shape nor multi-mound solar alignments, yet exhibiting a solar focal point to the east of the site. This focus is located at the intersection of solstice alignments running through mounds A and C and forms the basis of the site layout. A mathematical grid is demonstrated as a means of surveying the entire site from a higher elevation while creating a focal point in a low-lying area. Reasons for the focal location seem religiously motivated.

Archaeology, Culture, and K-12 Education, *by Sheila Richmond (Creole Heritage Center, Natchitoches, Louisiana)*

This presentation will feature the development of an experience for eighth grade students that involved archaeology and Caddo culture. The partnership of cultural and educational entities proved to be a key issue in the ability to present the adventure. The developers tied the activities to the curriculum and provided a hands-on, discovery learning experience for the students. This model can be adapted for other historic and/or cultural sites.

A Reanalysis of Strontium Isotopes from the Crenshaw Site: Implications on Caddo Interregional Warfare, ***by John R. Samuelsen (Arkansas Archeological Survey, Fayetteville, Arkansas)***

The salvage excavations of over 300 skulls and mandibles at the Crenshaw site (3MI6) have created many questions regarding the practices which led to their deposition. Strontium isotopes taken from 80 individuals at the site were processed as part of a NAGPRA grant in 2009 and led to a presentation at the 2010 Caddo Conference that claimed they supported evidence of interregional warfare between the Caddo and peoples in the Southern Plains. A more recent study by Schambach et al. in 2011 suggested that the strontium isotopes were too damaged to be useful in making interpretations. However, a reanalysis and comparison with recent literature show that the strontium isotopes are valid and consistent with the criteria for biologically available strontium for the area around Crenshaw, challenging the interpretations that the people deposited are victims of interregional warfare.

An Introduction to CRHR:ARCHAEOLOGY, ***by Robert Z. Selden, Jr. (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas) and Dillon M. Wackerman (Center for Digital Scholarship, Stephen F. Austin State University, Nacogdoches, Texas)***

In an effort to synthesize the large amount of digital information being produced within Caddo archaeology, we (the Center for Regional Heritage Research [CRHR] and the Center for Digital Scholarship) have created a new digital research resource: CRHR:ARCHAEOLOGY. The infrastructure of CRHR:ARCHAEOLOGY was constructed using the ContentDM platform—designed for digital collections management—and incorporates a blog, Facebook, Twitter, and the CRHR website to enlist the largest audience possible. While this resource was constructed to support the current and future endeavors of Research Associates, Research Affiliates, and Research Fellows at the CRHR, the datasets and reports are viewable and downloadable by a global audience. Additionally, we are in the process of attaining stable URL's for each entry in CRHR:ARCHAEOLOGY—likely a direct object identifier (DOI)—that will make each digital entry (3D .pdfs, images, reports, etc.) citable in reports, articles, and books. Due to the nature of archaeological research at the CRHR, which remains largely focused upon macro-level trends across the larger ancestral Caddo territory, CRHR:ARCHAEOLOGY should quickly come to represent one of the more formidable sources of digital information and data available to Caddo researchers.

Information derived from Burials from the Rowland Clark Site (41RR77), Red River County, Texas, ***by Jesse Todd (AJC Environmental LLC, Carrollton, Texas)***

The Rowland Clark site (41RR77) is located on the Red River in Red River County, Texas. During the excavation, 39 Caddo burials were unearthed that date to the McCurtain phase (ca. A.D. 1300-1650+). In this presentation, similarities and differences between burials from different periods in the phase will be presented, including the amount and types of ceramic vessels placed in the burials; arrow point type associations with ceramic vessels; and burial directions. I will also consider whether any of the burials at the site represent high status individuals.

A Caddo Community in the Ouachita Mountains, ***by Mary Beth Trubitt (Arkansas Archeological Survey, Arkadelphia, Arkansas), Meeks Etchieson (U.S.D.A. Forest Service, Hot Springs, Arkansas), Leslie L. Bush (Macrobotanical Analysis, Manchaca, Texas), and Vanessa N. Hanvey (Arkansas Archeological Survey, Arkadelphia, Arkansas)***

New archeological excavations at a site along the upper Ouachita River in Montgomery County, Arkansas, have produced a wealth of new information about Caddo Indian history in the Ouachita Mountains. Trubitt and Etchieson led excavations at 3MN298 in 2013 as a cooperative research project by the Arkansas Archeological Survey, the U.S.D.A. Forest Service, and the Arkansas Archeological Society. Artifacts and features indicate Native Americans lived at this location between at least 6000 B.C. to A.D. 1650 (the Middle Archaic through Mississippian periods). Here, we highlight our results and interpretations about the Caddo community between the mid-15th and mid-17th centuries, based on structure excavation, new AMS dates, and analysis of charred plant remains. We plan to return to the Ouachita National Forest to complete our research at the site in June of 2014.

Hearing and Hunting: Congenital Defects in an early Late Archaic male, *by Catrina Whitley (Bioarchaeology Support, Midlothian, Texas)*

Auditory atresia is a rare condition in which the external auditory meatus fails to develop. This presentation discusses a case of congenital auditory atresia in a male from Lake Ray Hubbard, Dallas, Texas, that was exposed by the 2011 drought. Dating to the Early Late Archaic 1300-1000 B.C., it is the earliest archaeologically documented and radiocarbon-dated case of the condition. No other cases have been reported in hunter-gatherer societies. The condition affects directional hearing and sound localization due to the lack of an ear canal and the use of these abilities warn us of danger, help us sort out sounds, and provide information on where a sound originated. Difficulty in locating sounds could result in an inability to hunt or perform other tasks requiring such capabilities. His lack of nutritional deficiencies and survival into his late 30s to early 40s suggests those residing in North Texas during the Early Late Archaic had flexible roles for men and cared for individuals with disabilities.

POSTER PRESENTATIONS

Factors Affecting the Magnetic Susceptibility of Sandy Mantle Soils in the East Texas Archaeological Region, ***by Steve Ahr (URS Corporation, San Antonio, Texas)***

Magnetic susceptibility is commonly measured in soils to identify buried archaeological zones and to assess the stratigraphic and cultural integrity of site deposits. Magnetic anomalies within a soil profile are often attributed to increased cultural activity or occupation surfaces. However, specific soil-forming processes that influence magnetic enhancement, such as fine clay neo-formation and translocation (lessivage), are rarely considered with regard to archaeological interpretation. This study integrates soil magnetic susceptibility, field morphology, soil characterization data, and micro-morphology to investigate the effects of pedogenic processes on magnetic enhancement in sandy mantle soils, and provides a baseline for interpreting magnetic signatures at archaeological sites in east Texas.

Direct Evidence (finally!) for Ancient Aquatic Tuber Use in Northeast Texas (*Nuphar lutea*, Nymphaeaceae), ***by Leslie L. Bush (Principal, Macrobotanical Analysis, Manchaca, Texas, and Research Affiliate, Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas)***

Excavations at the Murvaul Creek site (41PN175) near Carthage, Texas, in 2013 yielded carbonized remains of an aquatic tuber in the family Nymphaeaceae. The tubers are most likely pondlily (*Nuphar lutea*, also called bull lily, cow lily, or spatterdock), but they may be white waterlily (*Nymphaea odorata*). Historic consumption of waterlily and especially pondlily tubers is documented for Native people of the Northeast, California and Oregon, Montana, Wisconsin, the Great Plains, and the southern Great Lakes region. For the Caddo area, historical accounts mention consumption of "roots" and "ground nuts," but these seem to refer to terrestrial tubers. Terrestrial tubers have been identified from several East Texas sites (e.g., 41UR30), and the seeds and stems of plants with aquatic tubers have been recovered from several sites (e.g., Cedar Grove and Sentell in Arkansas and Pine Tree Mound, Stallings Ranch, and 41CP408 in Texas). The carbonized tubers from the Murvaul Creek site represent the first direct evidence of tuber consumption in addition to previously documented seed consumption and the use of Nymphaeaceae stems for medicinal purposes.

Pondlily and waterlily tubers require long cooking (36-72 hours) at low heat to become edible for humans. The burned tubers at the Murvaul Creek site thus point toward an East Texas tradition of earth oven cooking, parallel to the camas bulb cooking of the Plains and the agave/sotol traditions of the Southwest.

The Intensification of Corn (*kisi'*)-based Agriculture in the Ancestral Caddo Region: The Radiocarbon Evidence, ***by Robert Z. Selden, Jr. (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas) and Timothy K. Perttula (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas and Archeological & Environmental Consultants, LLC, Austin, Texas)***

Within the entirety of the ancestral Caddo region—including parts of Arkansas, Louisiana, Oklahoma, and Texas—there are 135 radiocarbon dates from corn samples. For older assays found to lack δ13C data, we use value estimates for fractionation correction suggested by Stuiver and Reimer (-10‰ for charred maize, a C4 plant). Each date was recalibrated in IntCal13 before date combination (R_Combine) in version 4.2.3 of OxCal. Using the summed probability distribution (SPD) of all assays, and the contributing SPDs from each

site as evidence, we find that the Formative (ca. A.D. 800-1000) and Early (ca. A.D. 1000-1200) Caddo periods were marked by the low level use of corn, while the Middle Caddo period (ca. A.D. 1200-1450) likely indicates the probable fluorescence (temporally) of corn-based agriculture as a technological advancement by the Caddo people. This is a trend that is further corroborated by recent research regarding Caddo stable isotope datasets.

Synthesis: What We Have Learned from the East Texas Radiocarbon Database, ***by Robert Z. Selden, Jr. (Center for Regional Heritage Research. Stephen F. Austin State University, Nacogdoches, Texas) and Timothy K. Perttula (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas, and Archeological & Environmental Consultants, LLC, Austin, Texas)***

This poster provides a short overview of what we have learned from the East Texas Radiocarbon Database since it became available on the Council of Texas Archeologists' website in 2011. These successes are numerous and include the advancement of novel methodological approaches; an improvement in our comprehension of the temporal nuances within the East Texas Archaic; the division of the East Texas Woodland period into Early, Middle and Late; the refinement of the Caddo temporal chronology – particularly from a geographic perspective -- and it has provided one line of evidence to use to argue for the fluorescence of corn-based agriculture during the Middle Caddo period. In short, the synthesis of radiocarbon dates from the East Texas region should be viewed as a considerable success. While but a single line of evidence, it will continue provide an important analytical foundation as more synthetic datasets are assembled and become available for use in the future.

Linking Instrumental Neutron Activation Analysis (INAA) and Geology in the Ancestral Caddo Region, ***by Robert Z. Selden, Jr. (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas), Timothy K. Perttula (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas and Archeological & Environmental Consultants, LLC, Austin, Texas), Suzanne L. Eckert (Department of Anthropology, Texas A&M University, College Station, Texas) and David L. Carlson (Department of Anthropology, Texas A&M University, College Station, Texas)***

This poster illustrates the success of a novel method of INAA that has been employed to reveal geochemical signatures in Caddo ceramic vessel sherds that correlate with local surficial geology. The geochemical data from the sherd assemblages were used within an exploration of potential ceramic provenance, which was successful at demarcating sherds from ceramic vessels made from clays in either the Claiborne or Wilcox Groups. Further geochemical segregation was also apparent between the Reklaw Formation in the Claiborne Group, and the Weches Formation in the Wilcox Group. These results point to a high degree of geochemical variability within the East Texas region, which stands in stark contrast with the numerous previous INAA studies that seemed to indicate that the clays in the East Texas region were quite homogenous. The analytical gains achieved through using this method seem to highlight an area of Caddo research where significant progress can be made with regard to the interpretation of INAA results in the future.

Instrumental Neutron Activation Analysis (INAA) of Shell-Tempered Ceramics in the Ancestral Caddo Region: Rethinking Methods, by ***Robert Z. Selden, Jr. (Center for Regional Heritage Research. Stephen F. Austin State University, Nacogdoches, Texas), Timothy K. Perttula (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas, and Archeological & Environmental Consultants, LLC, Austin, Texas), and David L. Carlson (Department of Anthropology, Texas A&M University, College Station, Texas)***

The geochemical analysis of shell-tempered ceramics in the ancestral Caddo region has been a matter of confusion since the mid-1990s. While Caddo archaeologists have long perceived most or all of the shell-tempered ceramics in East Texas to have originated from two different areas within the Red River basin, the geochemical data and interpretations remain inconsistent with that idea. This poster takes another look at this dataset, and considers an approach that was initially put forth by MURR, and then seemingly abandoned. Using only the geochemical data from shell-tempered sherds, we take a closer look at the contributions of calcium (Ca), strontium (Sr), sodium (Na), and manganese (Mn), and illustrate the spatial and temporal consistencies that can be used to establish and expand arguments for the trade and/or exchange of shell-tempered ceramics from multiple locations in the Red River basin.

At the Confluence of GIS and Geochemistry: Identifying Geochemical Correlates of Ripley Engraved Caddo Ceramics, ***by Robert Z. Selden, Jr. (Center for Regional Heritage Research. Stephen F. Austin State University, Nacogdoches, Texas), and Timothy K. Perttula (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas, and Archeological & Environmental Consultants, LLC, Austin, Texas)***

In this poster, we discuss a new approach to the identification and definition of spatial trends in archeologically-recovered ceramics associated with geochemical results produced using instrumental neutron activation analysis (INAA). Using all of the Ripley Engraved INAA samples, we posited that clays in the Claiborne and Wilcox Groups can be successfully demarcated by differences in concentrations of sodium (Na), cerium (Ce), and zinc (Zn) in the sherd pastes. Using a subset of those data from the Big Cypress Creek basin, we find that ceramics manufactured in three different Caddo political communities can be successfully demarcated based upon differential concentrations of arsenic (As), iron (Fe), and vanadium (V) found in the ceramic paste of Ripley Engraved sherds. With the larger dataset, we then identify six spatial trends associated with the geochemistry of Ripley Engraved Caddo ceramics.

Toward a Morphometric Phylogeny of Caddo Ceramics: A Test of 3D Geometric Morphometrics, ***by Robert Z. Selden, Jr. (Center for Regional Heritage Research, Stephen F. Austin State University), Timothy K. Perttula (Center for Regional Heritage Research, Stephen F. Austin State University, Nacogdoches, Texas, and Archeological & Environmental Consultants, LLC, Austin, Texas), and Michael J. O'Brien (Department of Anthropology, University of Missouri, Columbia, Missouri)***

In this poster, we use 3D geometric morphometrics as an exploratory tool for examining diversity in vessel form (shape) among 27 whole or reconstructed Caddo vessels from the Vanderpool site in Smith County, Texas. Forty-one landmarks from each vessel were exported to version 2.5 of Morphologika for generalized Procrustes analysis and principal components analysis and were then exported to R for cluster analysis (depending on sample size). Despite the small sample size, results indicate that 3D geometric morphometric analysis is an avenue of ceramic research where substantive analytical gains can be realized.

2014 Caddo Culture Club Activities Report

Michael Meeks II
Caddo Culture Club Vice-Chairman

Founded in 1988, the Caddo Culture Club is a non-profit organization devoted to the preservation of Caddo tribal songs and dances. The Caddo Culture Club was the first known group established to help preserve the songs and dances of the Caddo Indians. The Culture Club finds it very humbling being able to perform the very songs and dances that their ancestors once performed. Over the course of 2014, the Caddo Culture Club traveled to different parts of Oklahoma, Texas, Arkansas, and Louisiana to perform for the general public. The following are different events and functions that the Caddo Culture Club participated in.

Annual Caddo Conference

In 2014, the Caddo Conference was held in Tyler, TX, on the University of Tyler campus. To conclude the conference, the Caddo Culture Club performed traditional Caddo dances in Bergfeld Park in Downtown Tyler. In addition to performing at the conference, the Caddo Culture Club was asked to perform earlier in the day at the Azalea Arts and Crafts Fair.

"Cultural Exchange" Graduation Dance

The Caddo Culture Club was invited to perform at a "Cultural Exchange" Graduation Dance for the Kickapoo Tribe Education Department. The event was held to honor all of the 2013-2014 student graduates within the Kickapoo Tribe.

22nd Annual Caddo Culture Club Dance

In June, the Caddo Culture Club held its 22nd Annual Dance at the Caddo Nation Dance Grounds. Invited and Honored Guests were the Kickapoo Tribe JOM, Madeline Hamilton, and Caddo Culture Club Princess Maxine Watan. The first night of the dance consisted of Caddo Social Dancing and the second night consisted of a Morning Flag Raising, an evening meal, and both traditional and social Caddo dancing.

23rd Annual Clara Brown Dance

In September, the Caddo Culture Club served as singers for the 23rd Annual Clara Brown Dance held at the Caddo Nation Dance Grounds. The event began with the Caddo Turkey Dance, followed by an evening meal and Caddo Social Dancing.

24th Annual Adai-Caddo Powwow

In October, the Caddo Culture Club served as host drum for the Adai-Caddo Powwow in Robeline, LA. The day consisted of intertribal singing and dancing by both the Caddo Culture Club and a "Northern" Drum Group.

Caddo Dance at Ft. Saint Jean Baptiste

In November, the Caddo Culture Club was invited to perform at the St. Jean Baptiste Historical Site in Natchitoches, LA. The Club performed traditional songs and dances for the general public.

Fort Saint Jean Baptist

Fort Saint Jean Baptist

Fundraisers/Activities

In addition to these events, the Caddo Culture Club organizes different types of fundraisers and activities within the community. Some of these events are holiday parties for Halloween, Thanksgiving, and Christmas. Some of our fundraisers include benefit dances and food sales. During the Holiday season we also hold a toy and blanket drive which benefits the residents of our local nursing home as well as the children of the OU Children's Hospital.

The Caddo Culture Club would like to thank the Caddo Conference Organization and its Board of Directors for their long-continued support and inclusion of our annual report in the Caddo Conference Journal.

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