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Studies of Ceramic Vessel Sherds, Clay Figurines, and Daub from the Henderson Site (41CY6) in North Central Texas

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Studies of Ceramic Vessel Sherds, Clay Figurines, and Daub from the Henderson Site (41CY6) in North Central Texas

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Cover Art: Clay Figurine fragments from 41CY6

Report of Investigations No. 149

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Part I, Analysis of the Late Prehistoric Ceramic Sherds and Figurine Fragments from the Henderson Site (41CY6), Clay County, in North Central Texas

Timothy K. Perttula and Drew Sitters

Introduction

This report concerns the analysis of an assemblage of ceramic vessel sherds and two clay figurine fragments from the Henderson site (41CY60) on the Red River in the Rolling Plains of North Central Texas (Figure 1). This Late Prehistoric site was excavated in 1975 by students at Midwestern State University in Wichita Falls, Texas, under the direction of Dr. Philip S. Colee, but no report on the work was ever produced. The artifact collections eventually ended up at the Texas Archeological Research Laboratory at The University of Texas (TARL), where they were studied and documented in the Summer and Fall of 2019 by Dan Prikryl and I, affiliated researchers at TARL.

Figure 1. Clay County in the Rolling Plains of North Central Texas.

Not including sherdlets (n=545), the Henderson site ceramic vessel sherd assemblage includes 418 sherds from three different wares—shell-tempered, a heterogeneous ware with grit, bone, and/or grog tempers, and possible paint cup sherds (see Brooks and Drass 2005)—as well as two possible clay figurine fragments (see Appendix 1). Approximately 19 percent of the ceramic vessel sherds have been examined in detail (Appendix 2), gathering information on firing conditions, surface treatment, and sherd wall thickness from vessel sherds, along with temper inclusions, sherd type, and sherd decoration, if any.
Analytical Methods

A number of attributes have been employed in this study of the aboriginal ceramic vessel sherds (greater than 1.5 cm in length and width) from the Henderson site; sherdlets (less than 1.5 cm in length and width) in the assemblage have been counted (n=545) but not further analyzed for this study. The attributes discussed below are commonly employed in the analysis of aboriginal ceramics of prehistoric and historic age in Texas, as well as assemblages in North Central Texas (see Ellis and Perttula 2010: Arnn et al. 2010):

Temper inclusions or Non-plastics: Deliberate and indeterminate materials in the paste (Rice 1987:411), including a variety of tempers (i.e., grog or crushed sherds, bone, hematite, shell, grit, quartz sands, etc.) and “particulate matter of some size.” The burned mussel shell, grit, grog, and bone non-plastics in the wares at the Henderson site appear to have been deliberately added to the paste as tempers. The mussel shell and bone used for temper by potters has likely been burned and calcined, then crushed, before it was added to the paste. Sherd cross-sections were inspected macroscopically and with a 10X hand lens to determine the character of the paste and its inclusions.

Clays used for vessel manufacture were probably gathered from nearby alluvial settings along the Red River, but almost certainly they were gathered within a short (1-7 km away, at most) distance from a settlement or a temporary camp (e.g., Arnold 2000:343; Arthur 2006:52), so that an inordinate amount of time and energy was not expended by potters in hauling clay back to the site. Arthur (2006:52) points out that potters would be likely to select lower quality clays for vessel manufacture than high quality clays if the latter were farther away.

Vessel Form: The principal vessel form category is the restricted container, namely jars. As restricted containers, jars allow access by hand. The paint cup sherds are from small cups or bowls.

Additional form attributes that are recorded on rim sherds include the rim profile (outflaring or everted, direct, vertical or standing, and inverted), lip profile (rolled to the exterior, rounded, flat, or thinned), and base shape (flat or rounded) and form (i.e., stilt base).

Core Colors: Observations on ceramic sherd cross-section colors permit consideration of oxidation patterns (Teltser 1993:Figure 2a-h; Perttula 2005:Figure 5-30i-l), and thus the conditions under which a vessel was fired and then cooled after firing (Figure 2). Comments may also be included on the presence and location of sooting or smudging from cooking use (Skibo 1992), and the preservation and location of charred organic remains or residues, although this was very rare in the Henderson site ceramic assemblage.
Vessels tend to be fired in a variety of different ways, presumably reflecting personal preferences in firing, the desired vessel color, the kind of clays and their pastes that were used, and the functional and technological requirements of the kinds of vessel forms that were being manufactured at a specific site. Vessels were likely fired in an open fire, with the vessels either set atop the fire or nestled in the coals and ash.

Wall Thickness: Thickness is recorded in millimeters for each sherd, using a vernier caliper. These variations in vessel wall thickness are likely related to functional and technological decisions made by potters in how these different wares were intended to be used in local encampments or households, as well as the fact that vessels were likely built from the thick base upwards to the rim, with progressively thinner walls proceeding from the body to the rim (Krause 2016:57). The less substantial vessel walls in some of the vessel sherds would be well suited to the cooking and heating of foods and liquids and, because heat would have been conducted efficiently while heating rapidly, would have contributed to their ability to withstand heat-related stresses. Much thicker vessel sherds (greater than 8 mm in thickness) would have created stronger and more stable vessels, and would have been well suited for use as storage containers (Rice
Other wares may have also been intended for use in the serving of foods and liquids, and thinner and less porous vessel walls would have helped to maintain the temperature of served food and liquids; thinner and lighter vessels would have also contributed to the ease with which serving vessels could be handled, used, and transported.

**Interior and Exterior Surface Treatment**: The primary methods of finishing the surface of ceramic vessels at the Henderson site is smoothing (e.g., Rice 1987:138). Smoothing creates “a finer and more regular surface…[and] has a matte rather than a lustrous finish” (Rice 1987:138).

**Decoration**: Decorative techniques present in the ceramic vessel sherds from the Henderson site include brushing, appliqued, and stamped/impressed elements. These decorative techniques were executed by adding a node of clay to the vessel surface; by using frayed sticks or grass stems (brushing) dragged across the body surface; and by pressing/paddling “a striated wooden or bone paddle” into the moist or semi-moist clay of the ceramic vessel (Krause 2016:43).

**Type**: The one named ceramic type, Nocona Plain, identified in this study follows the work of Krieger (1946) and Suhm and Jelks (1962).

The ceramic cross-sections of three sherds (see Figures 3a-b and 5, below) were done to illustrate the temper and paste of the principal ceramic wares at the site. They were produced by Drew Sitters by sanding one edge of the sherd using 60, 150, 400, and 1000 grit 3M sandpaper. The preference was for the sanding of longer edges, while avoiding decorative elements. After achieving a flat and smooth surface, the prepared face was cleaned using a microfiber cloth and compressed air. An Epson Perfection V600 Photo scanner was employed to capture the cross-sections at a resolution of 1200 dpi. Saved as a TIFF file, the image was then post-processed in Adobe Photoshop by manipulating the brightness and contrast.

**Ceramic Wares at the Site**

There are three distinctive ceramic wares at the Henderson site: shell-tempered (n=327, 78.2 percent) Nocona Plain, vessel sherds (including one spindle whorl) with combinations of grit, bone, and/or grog temper (n=86, 20.6 percent), and possible paint cup sherds (n=5, 1.2 percent). There are also two clay figurine sherds in the 41CY6 assemblage, and 545 sherdlets.

**Shell-tempered vessel sherds**

The shell-tempered sherds from the Henderson site are from Nocona Plain vessels. As defined first by Krieger (1946:109-111, Figure 5, and Plates 4-5), and codified by Suhm and Jelks (1962:115 and Plate 58), it is a shell-tempered ware of jars and bowls with everted rims, mainly plain-surfaced, but there are sherds with appliqued, punctated, or incised decorative elements. In this ware, coarse, crushed, and burned
mussel shell temper is a principal constituent in the ceramic paste (Figure 3a-b). It is the principal ceramic ware of the Late Prehistoric Henrietta focus or phase recovered on sites on the upper Red (in both Texas and Oklahoma), Brazos, and Trinity rivers (Prikryl and Perttula 1995:192-193).

Figure 3. Nocona Plain sherd cross-sections from the Henderson site: a, Lot 15, plain body sherd;

The Henderson site ceramic assemblage includes 10 rim sherds (Figure 4a-c), nine that are plain, 292 body sherds, and 25 base sherds. Only one of the rim sherds is from a shell-tempered vessel with decorative elements, a rim (Lot 27a.2) from Lot 27a with an area of parallel brushed-incised marks and lines (Figure 4c).

The shell-tempered rim sherds have both everted (n=5, see Figure 4a-b) and direct rims (n=4); on one rim, the profile could not be determined, but it had a rounded lip. The everted rims have rounded lips, as do three of the direct rims; the other direct rim (with a brushed-incised decorative element) has a rounded and exterior folded lip (see Figure 4c). Two of the everted rims have collars, a common Nocona Plain rim treatment (see Suhm and Jelks 1962:Plate 58d).
The majority of the shell-tempered sherds that have been analyzed in detail are from vessels fired and cooled in a low oxygen or reducing environment (Table 1; see Figure 2b). Another 35.8 percent of the sherds are from vessels fired in a reducing environment, but cooled in the open air (see Figure 2f-g). The remaining 8.9 percent of the shell-tempered sherds are from vessels that were incompletely oxidized during firing (see Figure 2e).
Table 1. Firing conditions of the shell-tempered sherds from the Henderson site (41CY6).

<table>
<thead>
<tr>
<th>Firing condition</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>31</td>
<td>55.4</td>
</tr>
<tr>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
<td>8.9</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>5.4</td>
</tr>
<tr>
<td>G</td>
<td>17</td>
<td>30.4</td>
</tr>
<tr>
<td>H</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>I</td>
<td>-</td>
<td>-</td>
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<tr>
<td>J</td>
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</tr>
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<td>K</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>L</td>
<td>-</td>
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</tr>
</tbody>
</table>

Totals 56 100.0

The shell-tempered sherds are from vessels that are almost uniformly smoothed on one or both vessel surfaces (Table 2). Most commonly the sherds have been well-smoothed on both surfaces (42.9 percent of the shell-tempered sherds analyzed in detail), but smoothing on only either exterior or interior surfaces is also relatively common.

Table 2. Surface treatment of the shell-tempered sherds at the Henderson site (41CY6).

<table>
<thead>
<tr>
<th>Surface Treatment</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior smoothed</td>
<td>7</td>
<td>12.5</td>
</tr>
<tr>
<td>Exterior smoothed</td>
<td>18</td>
<td>32.1</td>
</tr>
<tr>
<td>Interior/exterior smoothed</td>
<td>24</td>
<td>42.9</td>
</tr>
</tbody>
</table>

Totals 49 87.5
The shell-tempered Nocona Plain sherds from the Henderson site are from vessels with moderately thick rim and body walls and thick bases (Table 3). The very thick bases are flat disks.

Table 3. Mean thickness of the shell-tempered sherds at the Henderson site (41CY6).

<table>
<thead>
<tr>
<th>Sherd type</th>
<th>Mean thickness (mm)</th>
<th>Range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rim</td>
<td>7.6 ± 0.87</td>
<td>6.3-10.0</td>
</tr>
<tr>
<td>Body</td>
<td>7.15 ± 0.99</td>
<td>5.2-9.4</td>
</tr>
<tr>
<td>Base</td>
<td>12.15 ± 1.72</td>
<td>9.4-17.8</td>
</tr>
</tbody>
</table>

Grit-bone-and grog-tempered vessel sherds

Sherds from the site with a coarse temper comprised of mixtures of grit, burned bone, and grog (Figure 5) include four rims (Figure 6), 66 body sherds, and 16 flat or stilted base sherds (Figure 7a-b); one plain rim sherd has no temper. There is no currently defined ceramic type that this ware can be assigned to in the North Central Texas region.

Figure 5. Cross-section of grit-grog-bone-tempered parallel brushed body sherd, Lot 23.1.
Ten body sherds in this ware (11.6 percent) have decorative elements, including a body sherd with a single appliqued node (Figure 8), eight with brushing marks (Figure 9a-c), and one with poorly preserved stamped impressions. This latter decorated sherd may be on the rim or rim-body juncture (Drass 1998).
The sherd with the appliqued node is likely near or just below the rim (see Figure 8), as is seen on shell-tempered Nocona Plain vessels (Suhm and Jelks 1962:115 and Figure 58e). The stamped sherd (Lot 6c) has linear impressions. The brushed body sherds have parallel (see Figure 9a, c) and opposed marks (see Figure 9b), and one sherd (Lot 39) has parallel brushed marks in a narrow zone.

About 55 percent of the grit-bone-grog sherds analyzed in detail from the Henderson site are from vessels fired in a reducing or low oxygen environment, but then cooled in the open air (Table 4; see Figure 2f-h). Another 18 percent are from vessels that were fired and cooled in a reducing environment (see Figure 2b), while one sherd is from a vessel that was fired and cooled in an oxidizing environment (see Figure 2a). Approximately 14 percent of these sherds are from vessels incompletely oxidized during firing (see Figure 2c, e), and 9 percent of the vessel sherds have been sooted or smudged (see Figure 2l).
Table 4. Firing conditions of the grit-bone-and grog-tempered vessel sherds from the Henderson site (41CY6).

<table>
<thead>
<tr>
<th>Firing condition</th>
<th>Rim</th>
<th>Body</th>
<th>Base</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>-</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>G</td>
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<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>H</td>
<td>1</td>
<td>-</td>
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<tr>
<td>J</td>
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<td>K</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>L</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Totals</td>
<td>1</td>
<td>18</td>
<td>3</td>
<td>22</td>
</tr>
</tbody>
</table>

Only 27 percent of the grit-bone-grog-tempered sherds from the Henderson site are smoothed on either the exterior or interior vessel surface (Table 5). The proportion of smoothed surfaced vessel sherds is about 60 percent less than is the case with the shell-tempered sherds from the site (see Table 2).

Table 5. Surface treatment on the grit-bone-grog-tempered sherds from the Henderson site (41CY6).

<table>
<thead>
<tr>
<th>Surface treatment</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior smoothed</td>
<td>5</td>
<td>22.7</td>
</tr>
<tr>
<td>Interior smoothed</td>
<td>1</td>
<td>4.5</td>
</tr>
</tbody>
</table>

The grit-bone-grog-tempered sherds from the site have thick vessel walls and thick, flat, base sherds (Table 6). The mean thickness of these rim, body, and base sherds overlap with the thickness of the shell-tempered rim, body, and base sherds from the
Henderson site, however, but rim and body sherds tend to be slightly thinner in the shell-tempered ware (see Table 3).

Table 6. Sherd mean thickness of the grit-bone-grog-tempered sherds from the Henderson site (41CY6)

<table>
<thead>
<tr>
<th>Sherd type</th>
<th>Mean thickness (in mm)</th>
<th>Range (in mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rim</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>8.05 ± 1.13</td>
<td>5.6-12.5</td>
</tr>
<tr>
<td>Base</td>
<td>11.7 ± 1.23</td>
<td>9.3-14.5</td>
</tr>
</tbody>
</table>

Possible paint cup sherds

There are five possible paint cup sherds in the Henderson site ceramic sherd assemblage (see Appendix 1 and 2). These sherds, either with no apparent temper or tempered with grit and bone, are from thick hand-molded cylindrical vessels that were apparently made to hold pigment and paint. Brooks and Drass (2005:149) note that “with the low temperature firing, walls of the paint cups are probably more permeable and pigment placed in the cups could potentially soak into the pot’s interior surface.” Most paint cup sherds studied by Brooks and Drass (2005:150-151) have a corncob-impressed surface, but smooth surfaced paint cups and cups with cord-impressed exterior surfaces are also known. Interior surfaces of the paint cups have a red pigment or wash.

None of the possible paint cup sherds at the Henderson site have corncob-impressed exterior surface or a red pigment or wash on their interior surfaces, although one (Lot 40b) has a poorly preserved impressed surface, and another has incised and impressed lines on its interior surface (Figure 10, left). The cup sherds have been fired in a reducing or low oxygen environment and cooled in the open air; surface colors are a brownish-red (Figure 10, right). The paint cup sherds are thick-walled, with a mean thickness of 13.08 ± 1.23 mm, and a thickness range of 11.2-14.5 mm.

Figure 10. Possible paint cup sherd from the Henderson site (41CY6) (Lot 41b.1): left, interior surface; right, exterior surface.
Paint cup sherds have been reported in three other Plains Village sites in North Central Texas—including the Harrell site (Perttula 2016)—as well as a number of Plains Village sites in southern and western Oklahoma (Figure 11). One of the North Central Texas sites with paint cup sherds is the Glass site on the Red River in Montague County (Lorrain 1967:199; see Prikryl and Perttula 1995), although Krieger (1946:111) noted that he had seen a few other such sherds in the collections made by a Mr. Powell Goodwin in the same general area (Archer and Young counties) as the Harrell site, but he noted they were rare. Krieger (1946:132) also saw “two thick, yellowish bowl-rim sherds, finger molded rather than coiled and quite like those from the Harrell site” in collections from sites in the Little Wichita River basin in Clay County, Texas. These sites are thought to date between ca. A.D. 1250-1500 (Bell 1984; Drass 1998).

Figure 11. Distribution of paint cup sherds and lids on Plains Village sites in northern Texas and southern and western Oklahoma (after Brooks and Drass 2005:Figure 1).

Clay Figurines

The figurine sherds from the Henderson site are from Lot 2 and Lot 20b; they appear to be body fragments of human-like shapes. The first is a non-tempered body fragment in Lot 2a with incised-punctated elements (Figure 12a) on both sides of the clay piece. The exterior surface of the Lot 2 figurine sherd has incised triangles with single punctations but the interior surface has incised triangles and an associated linear punctated row, while the Lot 20b figurine sherd, also without temper, has a straight
incised line dividing rows of punctations (Figure 12b). The two figurines are at least 21.0-32.0 mm in length, 13.0-13.9 mm in width, and 8.6-9.1 mm thick.

Figure 12. Clay figurine fragments from the Henderson site (41CY6): a, Lot 2; b, Lot 20b.

A figurine fragment at the Harrell site is rectangular and flat-based. It is not tempered or smoothed, but has a distinct flattened surface at the top of the fragment, and two depressions on the interior surface (Perttula 2016:Figure 21a-a’). It is 29.1 mm in length, 22.9 mm in width, and 13.2 mm thick.

Bell (1984:320 and Figure 14.3d-h) notes that clay figurines are present in Washita phase contexts in southern and western Oklahoma. They are not tempered and are poorly fired, as are the Henderson site figurine fragments, and are typically simply done male and female torsos with “incisions or punctates to mark body decoration.”

**Spindle Whorl**

One clay spindle whorl from a grit-bone-tempered vessel body sherd is in the Henderson site ceramic assemblage. Spindle whorls are disk-shaped sherds (usually base sherds or thick body sherds) that have a central perforation or drilled hole in them; this
spindle whorl sherd is 7.3 mm thick. The central perforation on this sherd is 6.5 mm in diameter, and the disk itself is 36.9 mm in diameter (Figure 13).

![Spindle whorl sherd](image)

**Figure 13. Spindle whorl sherd from the Henderson site (41CY6), Lot 38.**

The spindle whorl would have been affixed on a spindle to help maintain its rotary motion during spinning activities. The presence of the spindle whorl at the Henderson site suggests that fibers were being processed there to produce textiles. Materials that could have been used include animal hair and various vegetable fibers, among them hemp, slippery elm, mulberry, milkweed, and nettle, as well as the bark of trees.

**Spatial Distribution of Ceramic Vessel Sherds at the Henderson Site (41CY6)**

The ceramic vessel sherds from the Henderson site occur in two concentrations in the block excavations (Figure 14). Sherd Concentration 1 covers at least ca. 45 square meters in the northern and eastern parts of the block and closely overlaps spatially with Daub Concentrations B and C, suggesting these sherds are from vessels discarded inside of a daub-and grass-thatched covered structure, as well as perhaps in outside activity areas in the eastern part of the block (see also Perttula and Bush 2020:Figures 2a and 3a).

The second sherd concentration in the Henderson site block excavation covers at least 15 square meters at the southern end of the block (see Figure 14), about 3 m south of the southern part of Sherd Concentration 1. These sherds are likely also from vessels discarded inside a structure given the concentration of daub in that area of the block (see Perttula and Bush 2020:Figures 2a and 3a). Whether this represents a wall from a second structure or the opposing northern wall (Daub Concentrations B and C) of one structure has not been established.
Figure 14. Sherd Concentrations 1 and 2 in the Henderson site block excavations. Figure prepared by Brian Wootan. Orange shading is the highest sherd density, and the blue shading represent areas of moderate density.

Summary and Conclusions

One of the characteristic material culture remains recovered from Late Prehistoric sites in the Southern Plains are sherds from a number of plain (or minimally decorated) shell-tempered vessels. Shell-tempered vessel sherds are relatively abundant in archeological deposits of Late Prehistoric age, commonly being associated with Harrell and Washita arrow points (see Krieger 1946:Figure 7a-h; Duncan et al. 2007:55-56; Turner et al. 2011:196, 215). Such archeological associations in the Southern Plains are
thought to date from ca. A.D. 1200-1500, but this is far from certain. Uncalibrated radiocarbon dates from sites in southern and western Oklahoma with Harrell arrow points range from A.D. 1050-1750, but are concentrated between A.D. 1080 and A.D. 1400; IntCal13 calibrated age ranges for these dates fall between A.D. 1170 and A.D. 1425. The principal ceramic vessel sherd component with shell-tempered ceramics at the Henderson site (41CY6) is thought to be contemporaneous with these Southern Plains archeological assemblages.

Plain shell-tempered ceramic wares are a notable feature in ceramic assemblages in the Red, Brazos, and Trinity River basins in North Central Texas and in the Red River basin in south central Oklahoma that are part of the Henrietta phase, and in aboriginal settlements in southern and western Oklahoma in Late Prehistoric or Plains Village contexts dating after ca. A.D. 1200-1300 (Drass 1997, 1998; Ellis et al. 2015). Shell-tempered ceramics continued to be made and used in parts of North Central Texas into the 18th century, particularly on Wichita sites along the Red River in the Spanish Fort area. There were very considerable increases in the proportions of shell-tempered vessels in post-A.D. 1200/1250 sites in Plains Village sites in southern and western Oklahoma (Drass 1997:87) and in Late Prehistoric sites in the upper Trinity River basin (Ellis et al. 2015:172) and the upper Red River basin (Martin 1994).

The plain and smoothed shell-tempered ceramic vessel sherds from the Henderson site are from a ca. post-A.D. 1200/1250 component of the Henrietta phase. The sherds are from moderately thick Nocona Plain jars with thick and flat bases, some of which are stilted, and direct or everted rims. The shell-tempered ceramic assemblage from the site has only one decorated sherd, a lower rim fragment with a narrow zone of parallel brushed-incised marks and lines (see Figure 4c).

The ceramic vessel sherds from the Henderson site that are tempered with grit-bone-grog inclusions may be representative of a pre-A.D. 1200 Late Prehistoric component at the site, and may be associated with several types of stemmed arrow points found there; or it may simply indicate that the site has an early Henrietta phase occupation (i.e., early A.D. 1200s) with a mixture of the two wares. The grit-bone-grog-tempered ceramic assemblage at the Henderson site may be contemporaneous with the Paoli phase defined in the Washita River basin in south central Oklahoma (Drass 1997, 1998, 1999), dating from ca. A.D. 900-1200. Paoli phase assemblages typically have stemmed corner and side-notched triangular arrow point forms and grit-tempered pottery, including cordmarked and smoothed over cordmarked pottery from jars with conical, round, and flat bases and direct to slightly everted rims. Through time shell-tempered pottery makes its appearance, so that after ca. A.D. 1200/1250—during the Washita phase in the region—smoothed shell-tempered pottery dominates post-A.D. 1200/1250 to A.D. 1450 ceramic assemblages (Drass 1997, 1998). Accompanying the ceramic assemblage are side-notched and unnotched triangular arrow points.
Regional Comparisons

A substantial sample (n=578) of shell-tempered sherds have been recovered from a ca. A.D. 1300-1500 component at the Harrell site (41YN1), the type site for the Henrietta phase and the Nocona Plain type first defined by Krieger (1946). The site is situated on the eastern flank of the Rolling Plains in the Western Cross Timbers ecoregion of southern Young County, in the North Central Texas archeological region. The site is approximately 50 km west of the Cross Timbers and an equal distance east of the Broken Red Plains on the floodplain and alluvial terraces at the confluence of the Salt and Clear Forks of the Brazos River. The site lies ca. 100 km south-southwest of 41CY6.

The reanalysis of the ceramic wares at the Harrell site by Perttula (2016) indicates that there are shell-tempered, shell-hematite-tempered, thick (14-19 mm) non-tempered or bone-tempered paint cups, and other non-tempered or bone-tempered sherds not from paint cups. Most of these sherds are from plain vessels, but 7.5 percent of the shell or shell-hematite-tempered sherds have decorations, as do eight paint cup sherds; only 0.3 percent of the shell-tempered sherds at the Henderson site have decorative elements. The shell-tempered and shell-hematite-tempered vessel sherds have appliqued, brushed, brushed-incised, incised, punctated, incised-punctated, and red washed decorative elements; the latter are from thin-walled bowls, and not from paint cups. The paint cup sherds also have a red wash on their interior surface, and haphazard incised and incised-punctated elements on the exterior surface; none are corncob-impressed, the main decorative style of paint cups in Plains Village sites elsewhere in the Southern Plains (see Brooks and Drass 2005). The paint cup sherds from the Harrell site are the southernmost occurrence of this distinctive vessel in North Central Texas and southern and western Oklahoma (see Figure 11), and their presence at the site, and at the Henderson site, suggests a close association between the Harrell site and the Henderson site aboriginal occupants and Plains Village settlements on the Red River in North Central Texas and Washita phase settlements in southern and western Oklahoma (see Brooks and Drass 2005).

The shell-tempered wares at the Harrell site are from jars, bowls, and a very few bottles. The jars have moderately thick walls, with everted rims, and rounded and flat bases. Bowls have direct rims. Orifice diameters on these vessels range from at least 7 cm to 25 cm. About 28 percent of the exterior surface of these vessel sherds had been smoothed; 13 percent of the shell-hematite-tempered sherds have smoothing on their exterior surface. The shell-tempered wares were fired almost exclusively in a low oxygen or reducing environment, while the shell-hematite-tempered sherds were most commonly from vessels that were incompletely oxidized during firing. Paint cup sherds were fired primarily in an oxidizing or high oxygen environment.

The three separate ceramic wares at the Harrell site—shell-tempered, shell-hematite-tempered, and non-tempered and bone-tempered paint cups—had their own characteristic ways in which vessels were shaped, tempered, smoothed, decorated, and fired, not just Nocona Plain vessel sherds. Of the three wares, 91 percent are tempered with shell and are from everted rim and globular jars, bowls, and bottles, a few sherds of
which were decorated with wet paste elements on their rim and/or bodies, or had an interior red wash. The shell-hematite-tempered sherds comprise 5 percent of the assemblage, and most of these may be from a single vessel based on their spatial distribution. The paint cup sherds account for 2.6 percent of the ceramic vessel assemblage, and may be from three different paint cups. The paint cup sherds at the Harrell site and other North Central Texas sites are the best available clue to the cultural and social relationships of these aboriginal occupants and contemporaneous Plains Village settlements on the Red River in North Central Texas dubbed the Henrietta phase and southern and western Oklahoma and settlements in the Washita and Canadian rivers in southern and western Oklahoma dubbed the Washita phase (see Drass 2008:Figure 1).

The O. W. Hill site (41YN2), also in the upper Brazos River basin, had shell tempered sherds (n=5), along with thinner sherds (3.6-4.8 mm) of an unknown temper. One rim had an everted profile, and other sherds were decorated with punctations or shallow parallel incised lines (Ellis et al. 2015:178). Incised and punctated sherds comprise about 18 percent of the decorated sherds from the Harrell site (see Perttula 2016:Table 2), but such sherds are absent from the Henderson site. The commonalities between the Harrell and O. W. Hill sites suggests both were contemporaneously occupied during the Late Prehistoric period and the Henrietta phase, sometime after ca. A.D. 1200-1300. Plain shell-tempered sherds identified as Nocona Plain have also been recovered, but in very low numbers, during the archeological survey of South Bend Reservoir on the Brazos and Brazos Clear Fork rivers (Ellis et al. 2015:Table 5).

Ceramic bearing sites in the Little Wichita River in the upper Red River basin also have plain shell-tempered pottery from globular jars with rounded or flat bases, handless and lugs, as well as paint cup sherds (Krieger 1946:132). Some vessel sherds were decorated with cord marks as well as appliqued nodes below the rim (Krieger 1946:131) or had an exterior appliqued strip; no cord-marked sherds were present in the decorated sherd assemblage from the Henderson site. There are also shell-tempered sherds with cord-marked decorations from sites on the Red and Pease rivers; cord-marked pottery is a distinctive but rare feature of some ceramic vessels on post-A.D. 1250 Plains Village sites in southern and western Oklahoma (Bell 1984:320; Drass 1997, 1998).

Plains Village and Henrietta phase sites in Cooke, Grayson, and Montague counties in the upper Red River basin have plain, smoothed, shell-tempered pottery, primarily flowerpot-shaped jars and bowls with flat bases (Lorrain 1967, 1969; Prikryl and Perttula 1995:191; Martin 2005). Decorative elements are limited to appliqued collars, fingernail punctations, and appliqued nodes on the rim (Ellis et al. 2015:163). The Glass site in Montague County also had several paint cup sherds from non-tempered, thick, and hand-molded vessels (Lorrain 1967:44).

At the Dillard site (41CO174) on Fish Creek, the ceramic sherds are from smooth-surfaced Nocona Plain vessels (jars and bowls) tempered with shell (45 percent), limestone (19 percent), and shell-limestone (30 percent) (Martin 1994:162, 164-166); the sherds are from moderately thick vessels, with a mean thickness of 7 mm. About 1.4 percent of the sherds from the site are from thicker (8-11 mm) grit-bone-tempered vessels
with cord marked surfaces (Martin 1994:Figure 32b). Two calibrated radiocarbon dates on features from the Dillard site have two sigma ranges of A.D. 1150-1450 and A.D. 1290-1420 (Martin 1994:Table 12).

The Burton #1 site (34CT39) on the Red River in Cotton County, Oklahoma, just north of Clay County, Texas, has ceramic sherds from archeological deposits with 2 sigma calibrated radiocarbon dates of A.D. 1165-1310, A.D. 1355-1385, and A.D. 1280-1440 (Stokes 2003:32). The ceramics in these deposits are tempered with bone and quartz sand, and have a sandy, gritty, paste. Two of the sherds have rows of tool punctations (Stokes 2003:Figure 9a-b).

Bryan County, Oklahoma, Late Prehistoric sites have thick-walled shell-tempered ceramics, jars and bowls, and the vessels have flat bases, as do the Henderson site ceramics (Bell and Baerreis 1951). There are also grog or bone-tempered sherds in the assemblage, sometimes decorated with incised lines or vertical appliqued tabs (Bell and Baerreis 1951:Plate 8). In further investigations in Bryan County, in the Kemp Bottoms along the Red River opposite Grayson County, Texas, Albert (1984:54, 84-85 and Figure 30e) recovered grog-, grit-, limestone-, and shell-tempered pottery in association with a Bonham arrow point at the Steakley #1 site (34BR161). The body sherds are thick (10-11.7 mm), and one grog-tempered sherd has rows of tool punctations.

Ceramic vessel sherds from the 13th century A.D. Haley’s Point site (34Ma15) on the Red River at the upper end of Lake Texoma are almost exclusively shell-tempered, but a considerable proportion also have crushed limestone and/or burned bone added to the paste (Brack 2000:129). The use of limestone and burned bone as tempers added to the paste along with burned mussel shell led Rohn (1998:129) to refer to this pottery as Woodward Plain, var. Haley’s Point rather than Nocona Plain; Woodward Plain is typically found well to the north in the Arkansas River basin in Oklahoma. Other differences Rohn (1998) argued for between this pottery and some of the Nocona Plain ceramics from sites in North Central Texas include vessel forms (deep bowls and barrel-shaped jars rather than globular jars), rim profiles (direct rims rather than everted), and base form (a flat disk rather than a combination of rounded and flat disk bases). The shell-tempered ceramics from the Haley’s Point site are minimally decorated with appliqued bands or collars on the rim and smoothed into the lip (Rohn 1998:Figure 45, 47-48; Brack 2000:Figure 17). A few appliqued collars were identified in the Henderson site ceramic assemblage, and they are also present on Nocona Plain ceramics from other North Central Texas sites (see Krieger 1946:132).

Brack (2000:215) has suggested that “Nocona Plain and Woodward Plain probably represent closely related geographic varieties within a single type, rather than two exclusive types.” Based on this conclusion, and the possibility of temporal changes between Plains Village and Late Prehistoric sites in the region, Ellis et al. (2015:162) have proposed temporal changes in vessel form and rim treatment as well as the use of rare decorative treatments (i.e., appliqued nodes, appliqued ridges, lip tabs, and trailed, brushed, incised, punctated, and impressed lines and rows) between ca. A.D. 1200-1300
to post-A.D. 1300 “jars in Henrietta and Washita phase Plains Village sites that have globular bodies, everted rims, and both round and flat bases.”

Archaeological investigations at Henrietta phase sites along the Red River in Jefferson and Love counties, Oklahoma, documented major Late Prehistoric settlements with shell-tempered plain ceramics (Drass and Martin 2010:Figures 13 and 24). Site 34LV181 also had parts of an East Texas Caddo Crockett Curvilinear Incised vessel recovered by the landowner (Drass and Martin 2010:Figure 14). Conventional radiocarbon dates from the sites range from 980 ± 40 B.P. (34LV184), 850 ± 40 B.P. (34LV43), 830 ± 40 B.P. (34LV181), and two identical dates of 480 ± 40 B.P. from 34JF109. One sigma calibrated dates provided by Drass and Martin (2010:8, 15) range from A.D. 1016-1151 and A.D. 1181-1256 from two sites and two other dates with calibrated intercepts of A.D. 1210 and A.D. 1430 (Drass and Martin 2010:26, 31).

Acknowledgments

I appreciate the opportunity provided by Dan Prikryl to analyze the ceramic sherd assemblage from the Henderson site (41CY6) at the Texas Archeological Research Laboratory at The University of Texas at Austin (TARL), and for TARL making office space available in which to conduct these analyses. Richard Drass provided useful comparative information on Southern Plains ceramic assemblages. Lance Trask prepared Figures 1, 2, and 9 of the report, and Brian Wootan took the artifact photographs and Figure 14.

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## Appendix 1,

**Inventory of Ceramic Sherds and Possible Clay Figurine Fragments by Lot Number for the Henderson Site (41CY6) Investigations**

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Sherd Descriptions</th>
</tr>
</thead>
</table>
| 1       | 1 plain grog-grit-tempered body sherd (1.1)  
1 plain grog-grit-tempered base sherd  
1 plain grog-bone-grit-tempered body sherd, possible paint cup (1.3)  
6 plain shell-tempered body sherds (1.2)  
1 plain shell-tempered rim sherd |
| 2a      | 1 clay figurine fragment, no temper (2a.1)  
2 plain shell-tempered body sherds  
1 plain shell-tempered base sherd |
| 2b      | 2 plain shell-tempered body sherds |
| 3       | 1 plain shell-tempered body sherd  
1 plain shell-tempered rim sherd (3.1) |
| 4a      | 2 plain shell-tempered body sherds |
| 4b      | 1 plain shell-tempered body sherd (4b.1) |
| 5a      | 1 plain shell-tempered body sherd (5a.1) |
| 5b      | 1 plain grog-grit-tempered body sherd |
| 6a      | 1 plain bone-tempered body sherd (6a.1)  
3 plain shell-tempered body sherds (6a.2)  
1 plain shell-tempered base sherd |
| 6b      | 1 plain grog-grit-tempered body sherd (6b.1)  
1 plain grog-grit-tempered base sherd  
7 plain shell-tempered body sherds (6b.2, 6b.3) |
| 6c      | 1 grog-grit-tempered body sherd with parallel stamped impressions  
1 plain shell-tempered body sherd |
| 7       | 1 plain shell-tempered body sherd |
7  1 plain shell-tempered base sherd

9a  1 bone-grit-tempered body sherd with parallel brushed marks (9a.2)
    1 plain bone-grog-tempered base sherd
    10 plain shell-tempered body sherds (9a.1)
    1 plain shell-tempered base sherd

9b  3 plain shell-tempered body sherds (9b.1, 9b.2)

9c  1 plain shell-tempered body sherd

10a 1 plain shell-tempered body sherd
     1 plain shell-tempered base sherd (10a.1)

10b 1 grog-bone tempered body sherd with opposed brushed marks (10b.1)
     4 plain shell-tempered body sherds (10b.2)

11a 1 plain grog-grit-tempered rim sherd
     1 plain grog-grit-bone-tempered body sherd
     1 grog-grit-tempered body sherd with parallel brushed marks
     1 plain shell-tempered rim sherd (11a.1)
     20 plain shell-tempered body sherds (11a.2, 11a.3, 11a.4)
     1 plain shell-tempered base sherd

11b 1 plain shell-tempered body sherd

11c 2 plain shell-tempered body sherds

11d 1 plain grit-grog-bone-tempered base sherd
     1 plain shell-tempered body sherd

12  1 plain grog-grit-tempered body sherd

13  1 plain grit-grog-bone-tempered rim sherd
     1 plain grit-grog-bone-tempered body sherd
     1 plain grog-grit-tempered body sherd
     1 plain bone-grit-tempered base sherd (13.2)
     1 plain grog-grit-tempered base sherd
     30 plain shell-tempered body sherds (13.1, 13.3, 13.4)
     2 plain shell-tempered base sherds

14  1 plain grog-grit-tempered body sherd
     1 plain grit-tempered base sherd
     1 plain grog-grit-tempered base sherd
     12 plain shell-tempered body sherds
     1 plain shell-tempered base sherd
15a 2 plain shell-tempered body sherds
15b 1 plain grit-bone-tempered body sherd
1 plain shell-tempered body sherd
16a 1 plain bone-tempered body sherd
1 plain grit-tempered body sherd (16a.1)
1 plain shell-tempered rim sherd (16a.2)
11 plain shell-tempered body sherd
2 plain shell-tempered base sherds
16b 1 plain non-tempered rim sherd
1 plain bone-tempered body sherd
1 plain grit-tempered rim sherd (16b.1)
1 plain grog-tempered body sherd
5 plain grit-tempered body sherds (16b.3, 16b.4)
23 plain shell-tempered body sherds
2 plain shell-tempered base sherds (16b.2)
16c 1 plain grit-tempered body sherd
2 plain shell-tempered body sherds (16c.1)
18a 1 plain grit-tempered body sherd
4 plain shell-tempered body sherds (18a.1)
18b 1 plain shell-tempered rim sherd
1 plain shell-tempered body sherd
19 1 plain bone-tempered body sherd
9 plain shell-tempered body sherds (19.1)
1 plain shell-tempered base sherd
20a 1 plain grit-tempered body sherd
1 plain shell-tempered rim sherd
7 plain shell-tempered body sherds (20a.2, 20a.3)
4 plain shell-tempered base sherds (20a.1)
20b 1 figurine fragment
20c 3 plain shell-tempered body sherds
21 1 plain bone-tempered body sherd
2 plain grit-tempered body sherds
1 plain grit-grog-tempered base sherd
9 plain shell-tempered body sherds (21.1)
23 1 plain bone-tempered body sherd
    1 plain bone-grit-tempered body sherd
    1 plain grit-tempered body sherd
    1 plain grit-tempered base sherd
    1 grit-grog-bone-tempered body sherd with parallel brushed marks (23.1)
    2 plain grit-bone-tempered body sherds (23.2)
    21 plain shell-tempered body sherds (23.3, 23.4)
    1 plain shell-tempered base sherd

24a 2 plain grit-bone-tempered body sherds
     2 plain shell-tempered rim sherds (24a.1)
     10 plain shell-tempered body sherds (24a.2)
     2 plain shell-tempered base sherds

24b 1 plain bone-grit-tempered rim sherd
     1 plain grit-tempered body sherd (24b.1)
     1 plain shell-tempered body sherd
     1 plain shell-tempered base sherd

25 5 plain shell-tempered body sherds (25.1)
    1 plain shell-tempered base sherd

26 1 plain bone-grit-tempered body sherd
    5 plain shell-tempered body sherds
    1 plain shell-tempered base sherd

27a 1 plain grit-tempered body sherd
     1 plain grit-tempered base sherd
     1 shell-tempered rim sherd with parallel brushed-incised marks (27a.2)
     3 plain shell-tempered body sherds (27a.1)

27b 3 plain shell-tempered body sherds (27b.1, 27b.2)

29 6 plain shell-tempered body sherds

30a 6 plain shell-tempered body sherds (30a.1, 30a.2)

30b 1 plain bone-grit-tempered body sherd
     2 plain shell-tempered body sherds (30b.2)

30c 1 plain shell-tempered body sherd

30d 1 plain grit-bone-tempered body sherd
     2 plain shell-tempered body sherds
     1 plain shell-tempered base sherd
31a  2 plain shell-tempered body sherds (31a.1)
31b  1 grit-tempered body sherd with parallel brushed marks
    1 plain shell-tempered body sherd
33   1 plain shell-tempered body sherd
    1 plain shell-tempered base sherd
34   1 plain grit-tempered base sherd
36a  1 plain grit-tempered body sherd
    2 plain grit-tempered base sherds (36a.1)
36b  1 plain grit-grog-tempered base sherd
    6 plain shell-tempered body sherds (36b.1, 36b.2)
37a  3 plain grit-tempered body sherds
    3 plain shell-tempered body sherds (37a.1)
37b  1 plain shell-tempered body sherd
38   1 grit-bone-tempered body sherd, spindle whorl
38a  1 grit-tempered body sherd with parallel brushed marks
    2 plain shell-tempered body sherds (38a.1)
38b  1 grit-tempered body sherd with appliqued node (38b.1)
    2 plain grit-tempered body sherds
    7 plain shell-tempered body sherds (38b.2)
38c  4 plain shell-tempered body sherds (38c.1)
39   1 plain bone-grit-tempered base sherd
    1 grit-tempered body sherd with parallel brushed zone
    1 plain grit-tempered base sherd
    2 plain shell-tempered body sherds
39   1 plain shell-tempered rim sherd (39.1)
40a  1 plain shell-tempered body sherd (40a.1)
40b  1 grit-tempered body sherd with parallel brushed marks (40b.3)
    1 plain grit-bone-tempered body sherd (40b.2)
    2 plain grit-tempered body sherds
    1 plain grit-tempered base sherd
1 plain grit-tempered body sherd, possible paint cup
2 plain shell-tempered body sherds (40b.1)

41a 1 plain shell-tempered body sherd

41b 3 plain grit-tempered body sherds
3 plain grit-bone body sherds, possible paint cup (41b.1)
3 plain shell-tempered body sherds (41b.2)

44a 1 plain grit-tempered body sherd
1 plain shell-tempered body sherd (44a.1)

44b 3 plain shell-tempered body sherds (44b.1)

44c 1 plain shell-tempered body sherd
Appendix 2,

**Detailed Analysis of a Sample of the Ceramic Sherds by Lot Number-Specimen Number from the Henderson Site (41CY6)**

<table>
<thead>
<tr>
<th>Lot No./Specimen No.</th>
<th>Sherd type</th>
<th>Temper</th>
<th>FC</th>
<th>ST</th>
<th>Th (mm)</th>
<th>Decoration/Rim-Lip Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>body</td>
<td>grog-grit</td>
<td>C</td>
<td>-</td>
<td>8.1</td>
<td>Plain</td>
</tr>
<tr>
<td>1.2</td>
<td>body</td>
<td>shell</td>
<td>B</td>
<td>I/E SM</td>
<td>8.0</td>
<td>Plain</td>
</tr>
<tr>
<td>1.3</td>
<td>body</td>
<td>grog-bone-grit</td>
<td>F</td>
<td>-</td>
<td>11.2</td>
<td>Plain</td>
</tr>
<tr>
<td>3.1</td>
<td>rim</td>
<td>shell</td>
<td>G</td>
<td>E SM</td>
<td>6.3</td>
<td>Plain; everted rim and rounded lip</td>
</tr>
<tr>
<td>4b.1</td>
<td>body</td>
<td>shell</td>
<td>B</td>
<td>I/E SM</td>
<td>7.6</td>
<td>Plain</td>
</tr>
<tr>
<td>5a.1</td>
<td>body</td>
<td>shell</td>
<td>B</td>
<td>-</td>
<td>7.6</td>
<td>Plain</td>
</tr>
<tr>
<td>5b.1</td>
<td>body</td>
<td>grog-grit</td>
<td>E</td>
<td>-</td>
<td>9.1</td>
<td>Plain</td>
</tr>
<tr>
<td>6a.1</td>
<td>body</td>
<td>bone</td>
<td>L</td>
<td>E SM</td>
<td>6.5</td>
<td>Plain</td>
</tr>
<tr>
<td>6a.2</td>
<td>body</td>
<td>shell</td>
<td>B</td>
<td>I/E SM</td>
<td>9.2</td>
<td>Plain</td>
</tr>
<tr>
<td>6b.1</td>
<td>body</td>
<td>grog-grit</td>
<td>F</td>
<td>E SM</td>
<td>7.3</td>
<td>Plain</td>
</tr>
<tr>
<td>6b.2</td>
<td>body</td>
<td>shell</td>
<td>G</td>
<td>E SM</td>
<td>6.2</td>
<td>Plain</td>
</tr>
<tr>
<td>6b.3</td>
<td>body</td>
<td>shell</td>
<td>G</td>
<td>E SM</td>
<td>6.0</td>
<td>Plain</td>
</tr>
<tr>
<td>9a.1</td>
<td>body</td>
<td>shell</td>
<td>B</td>
<td>I/E SM</td>
<td>8.2</td>
<td>Plain</td>
</tr>
<tr>
<td>9a.2</td>
<td>body</td>
<td>bone-grit</td>
<td>B</td>
<td>-</td>
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<td>I SM</td>
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<td>shell</td>
<td>B</td>
<td>I SM</td>
<td>7.6</td>
<td>Plain; everted rim and rounded lip</td>
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<td>E SM</td>
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FC=firing conditions, see Figure 2  
ST=surface treatment; I SM=interior smoothed; E SM=exterior smoothed  
Th=thickness
Part II, Daub and Burned Clay from the Henderson Site (41CY6), Clay County, Texas

Timothy K. Perttula and Leslie L. Bush

Daub from wattle and daub-covered structures are common in North American aboriginal sites, including sites in the Southern Plains during Plains Village times (after ca. A.D. 1200-1300). Richard Drass (October 2019 personal communication) has noted that “daub is common at most Washita River phase sites. House walls (square to rectangular houses) were often plastered with clay and many have grass and stick impressions…Daub appears primarily along outer walls but there may have been clay on smoke holes and around interior hearths.” The study of daub from archaeological sites of both prehistoric and historic age, as well as the experimental construction and burning of earthen structures of wattle and daub coverings (Peinetti et al. 2017), includes the analysis of structure construction, destruction, and architectural form (see Drury 1982; Terrel and Marland 1983; Shaffer 1993; Stevanovic 1997; Sherard 2009; Lintz 2015; Harris 2016; Wilkens 2017; Wolf 2018) from the shape and character of the daub and its impressions; structure reconstructions from spatial distributions of daub (see Logan and Hill 2000); and paleoenvironmental reconstruction from impressions on daub and inclusions in the daub (see Peacock 1993; Seltzer and Peacock 2011).

The concern of the present analysis of daub and burned clay is to gain insights on the construction and thatching of structures at the Henderson site. In the absence of post holes, hearths, and other direct evidence for the construction and use of structures such as storage pits in the 1975 excavations, the extensive and well-preserved daub pieces found at the site, and their distribution, are the best prima facie evidence that the excavations at the Henderson site were amidst the remains of one or possibly multiple burned Henrietta phase house. Additionally, Leslie L. Bush has examined samples of the larger and better preserved pieces of daub to identify plant materials used in wall thatching and for the wattle.

Substantial amounts of daub and burned clay pieces were recovered in the excavations at the Henderson site (41CY6) (Table 1). By weight, approximately 3.9 kg (ca. 8.6 pounds) of daub are in the assemblage, as well as 0.75 kg (ca. 1.7 pounds) of burned clay pieces. The mean weight of the daub is 1.13 g per piece compared to 1.2 g per piece of burned clay. Both the daub and burned clay have been pulverized and fragmented mainly into small pieces by 20\textsuperscript{th} century plowing of the site’s archeological deposits.

Table 1. Daub and Burned Clay pieces from the Henderson site (41CY6).

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<th>Burned Clay No.</th>
<th>Weight (g)</th>
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Table 1. Daub and Burned Clay pieces from the Henderson site (41CY6), cont.

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<th>Weight (g)</th>
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Totals 4400 3897.3 g 913 751.9 g

Daub represents burned pieces of clay with stick, cane, and grass impressions left from its placement against a woven lattice of wattle or wooden strips used vertically in wall construction framed by upright poles. In some cases, the impressions are from reinforcements to the daub by grass or other fibrous materials that was intended to hold the clay mix together when it was applied to the wattle; the daub was likely mixed by hand. Burned clay, on the other hand are pieces of clay, usually rounded in the case of...
this assemblage, that have no preserved impressions. Such pieces likely represent fragments of the clay mix or building material exposed to fire that had been used in house construction in areas that had no wattle or grass thatch covering; another possibility is simply that they are eroded pieces of daub.

The larger pieces of daub are at least 25-50 mm in thickness, columnar in shape (Figure 1) (breaking in columnar or rectangular sections), with grass and cane

![Figure 1](image)

**Figure 1.** Selected examples of daub from the Henderson site (41CY6): a-b, e, parallel grass impressions, two-sided (Lot 38 and Lot 40); c, parallel grass impressions on one side, and shallow concavities on the other (Lot 38); d; cane impressions on one side (lot 20); f, cane or stick impressions (Lot 20).
impressions on one or both sides of the piece; a number of pieces are clearly smoothed on their outer surface. These impressions run vertically or parallel on the daub, with the impressions of wider cut or split cane or sticks with the bark removed that run parallel to or cross-cut the grass impressions (Figure 1). These patterns suggest that much if not all
of the daub is from the walls of structures, and the clay lining was applied vertically, not necessarily from smoke holes or clay screens. The pieces of daub with grass impressions on both inner and outer surfaces of the clay lining suggests the grass thatching was applied in layers on at least some part of the structure walls. How high the daub-covered lining extended up the grass-thatched walls or even onto the roof of the structures at the Henderson site is not known.

The daub was fired primarily in a reducing or low oxygen environment, leaving it a gray to black color; other pieces are highly oxidized, suggesting proximity to fire, leaving them a reddish-pink to white color. A number of the pieces of daub are vasicular and vitrifed, with tiny holes “where grass fibers disintegrated or burned away” (Harris 2016:3). Almost all of the burned clay, however, has been oxidized an orange to red color during firing, suggesting it was not smothered when the structure or structures at the Henderson site burned.

By frequency, the daub in the block excavations at the Henderson site occurs in two primary concentrations (A and B) about 7 m apart in the northern and southern parts of the block excavations, as well as a third concentration at the northern and eastern end of the block (Figure 2a). Concentrations A and B each have more than 1400 pieces of daub, and cover areas of between at least ca. 16-30 square meters; Concentration C covers at least 10 square meters, but only has 157 pieces of daub. In Concentration A, more than 1210 pieces of daub were recovered in just one excavation unit (W1), while the daub in Concentration B (n=2162, almost half of all the recovered daub) is widely distributed in a 15-square meter area at the southern end of the block (Figure 2a).

The burned clay pieces by number are also found in the same three concentrations as the daub (see Figure 2b). The highest concentration of burned clay is in Concentration A (n=690), however, comprising more than 77 percent of all the burned clay pieces recovered in the excavations (see Table 1). This burned clay concentration covers at least ca. 16 square meters, and much of it (n=518) is in a 10-square meter area. Perhaps this density of burned clay represents remnants of clay-lined hearths or screens, or the lining of a smoke hole.

The other two concentrations of burned clay cover between at least 14-30 square meters of the block excavations (see Figure 2b). The densities of burned clay pieces in these two areas is much lower than in Concentration A, accounting for only 7-12 percent of the recovered burned clay, suggesting the burned clay is incidental to either the construction or burning of structures at the Henderson site.

By weight, the daub in the excavations occur in two concentrations in the northern and southern parts of the block (Figure 3a), covering areas of at least 11-15 square meters. These areas spatially overlap with daub Concentrations A and B based on daub frequency (see Figure 2a). In the case of daub weight, daub Concentration C (see Figure 2a) appears to be spatially associated with Concentration A (Figure 3a), although the weight of the daub in this 15-square meter area is much less than in the western and northern parts of the block.
Figure 2. Distribution by number of daub and burned clay pieces at the Henderson site: a, daub; orange shading represents the highest density, and the blue shading a moderate density.
Figure 2b, burned clay. Orange shading represents the highest density, and the blue shading a moderate density.
Figure 3. Distribution by weight of daub and burned clay pieces at the Henderson site: a, daub; orange shading represents the highest density, and the blue shading a moderate density.
The burned clay by weight in the Henderson site excavations occurs on one main concentration covering ca. 26 square meters in the northern part of the block (Figure 3b). The same distribution is apparent in the burned clay by frequency (see Figure 2b). A second but less significant concentration of burned clay pieces is in a 15-square meter area at the southern end of the block excavations. This second area of burned clay pieces is 4 m south of the main burned clay concentration.

Leslie L. Bush (Macrobotanical Analysis, Manchaca, Texas) examined in detail 12 daub specimens (see Figure 1a-k) with plant impressions from the Henderson site, a Henrietta phase settlement near the intersection of the Wichita and Red River valleys. As
mentioned above, the daub is believed to have come from the remains of two walls representing one or more structures.

Samples were examined under a stereoscopic light microscope at 7-34 X magnification. Photographs were made with a Canon PowerShot SX620 using the macro feature. A U.S. quarter was used for scale. Impressions are of plants with parallel veins (monocots) (Figure 4). Diameters ranged from about 1-3 millimeters. Some impressions formed arcs indicating round shapes, and these are interpreted as stems. Other impressions were flat, often with a wider central section. These are interpreted as leaves with prominent central mid-veins (Figure 5). Some possible nodes were observed, but none were entirely clear. Overall, the suggestion is that the impressions are that of a grass, but members of node-less monocot families with long, thin, leaves such as sedges (Cyperaceae) and rushes (Juncaceae) cannot be ruled out. The diameters of stems and leaves are too narrow to be cattails (Typhaceae).

Figure 4. Daub Specimen H showing impressions of plant material with parallel veins.
Figure 5. Daub Specimen F showing cross-sections of possible molds of leaves with prominent mid-veins.

Archeologists often associate river cane (*Arundinaria* spp.) with house construction in the Eastern Woodlands, but the Henderson site impressions are unlikely to be river cane for several reasons. River cane is a perennial, rhizomatous, grass that grows to diameters of 30 mm or more (Shaw 2012). Although narrow river cane stems could have been harvested young from an even-aged stand (likely produced by human-set fire and intended for basketry), the narrow leaf impressions are inconsistent with river cane. In addition, river cane has not been recorded west of Grayson County, Texas, in modern times (Kartesz 2015; USDA 2019).

The mostly-parallel orientation of the plant impressions is easily seen in Figures 4 and 6, and in Figure 1 of this report. Interesting, many of the daub specimens have parallel, tubular, lacunae running through the center of the pieces (Figures 7 and 8). Although these are mostly negative molds, positive casts of former plant material may be present in one specimen (Figure 9). Because these internal features are consistent in size and orientation with the external plant impressions, the cavities are interpreted here as molds of additional plant stems. This suggests either wet clay was thoroughly pressed into existing architectural elements made of parallel plant stems or that clay was incorporated into long bundles of plant stems prior to placement in the structure, perhaps in a form resembling straw-tempered clay ropes.
Figure 6. Daub Specimen B showing impressions of plant stems and leaves oriented parallel to each other.

Figure 7. Daub Specimen B showing cross sections of possible molds of monocot stems oriented parallel to the external stems.
Figure 8. Daub Specimen E showing cross sections of possible molds of monocot stems.

Figure 9. Daub Specimen D showing possible cast of plant material.
Summary

The analysis of the daub and burned clay pieces from the excavations at the Henderson site (41CY6) indicate that at least one Plains Village Henrietta phase house structure was burned there; the walls of one or more structures are marked by concentrations of fired daub. These structures were of wattle and daub construction, with rigid or bent support poles covered with plant wattle, sticks, and cut branches that were tied or woven in place with the poles. A likely grass thatching was then added to the walls and roof of the building, followed by a thick clay lining of daub presumably collected nearby that covered the framework as well as interstitial areas of the structure. When the structure or structures caught fire, the impressions of the cane, other structural materials, and the likely grass thatching remained in the fired daub walls, which collapsed and were preserved in the archeological record at the Henderson site.

The detailed examination of a sample of the daub pieces by Leslie L. Bush suggests that the impressions preserved on the daub are from monocots, likely grasses, but sedges and rushes may also have been used in the thatching. Other impressions may be from leaves. Internal features on some of the daub pieces, where there are parallel, tubular, lacunae, suggests that either wet clay was thoroughly pressed into existing architectural elements made of parallel plant stems or that the clay was incorporated into long bundles of plant stems prior to placement in the structure, perhaps in a form resembling straw-tempered clay ropes. These internal features were preserved when the structure (or structures) caught on fire.

Available profiles along the northern part of the block excavations documented several likely post holes along with ash, charcoal, and what was called “burned earth.” These findings, taken together with the two concentrations of daub and burned clay (by both quantity and weight) in the block excavations at the Henderson site, are associated with wattle and daub structure walls that were likely grass-thatched. These walls are at least 4 m apart, but in the absence of other post holes, hearths, or structure internal features, it is not clear that they are north and south walls of one structure (possibly rectangular) or walls of two adjacent structures.

Acknowledgments

Brian Wootan prepared Figure 1-3, and Leslie Bush prepared Figures 4-9. We appreciate the opportunity provided by Dan Prikryl to examine the daub pieces from the Henderson site.

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