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The Archaeology of the 16th And 17th Century Caddo in the Post Oak Savannah of Northeast Texas: The Tuinier Farm (41HP237), R. A. Watkins (41HP238), and Anglin (41HP240) Sites in the Stoots Creek Basin, Hopkins County, Texas

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Timothy K. Perttula, with contributions by Elsbeth Dowd, Lee Green, George Morgan, Bo Nelson, LeeAnna Schniebs, Beau Schriever, Jesse Todd, and Mark Walters

INTRODUCTION

The Tuinier Farm (41HP237), R. A. Watkins (41HP238), and Anglin (41HP240) sites are 16th to 17th century Caddo sites in the modern-day Post Oak Savannah of Northeast Texas (Diggs et al. 2006:Figure 2). All three of the sites are located on Stouts Creek, in the eastern part of Hopkins County, Texas, a northward-flowing tributary to White Oak Creek in the Sulphur River basin; the modern channel of White Oak Creek lies ca. 15 km north of these sites. The Culpepper site (41HP1), a previously investigated mid-to late 17th century Caddo habitation and cemetery site (Scurlock 1962), is about 2 km downstream. Small areas of tall-grass prairie lie to the north between the Stouts Creek sites and White Oak Creek, but the eastern extent of the larger White Oak and Sulphur prairies (see Jordan 1981) is approximately 15 km to the west and northwest.

At the time of the Caddo occupation of the Stouts Creek sites, the climate was wetter and warmer than today, with significant mesic periods between A.D. 1477-1524, A.D. 1539-1572, and A.D. 1603-1670 (Perttula 2005, ed.:22 and Table 2-3). After A.D. 1670, the years from A.D. 1671-1676 were relatively cool and dry. The more mesic periods had more equitable rainfall (adequate growing season rainfall) and this, combined with the warmer temperatures (see Perttula 2005, ed..: Figure 2-3a), led to an increased net productivity and carrying capacity of plants and animals in the Post Oak Savannah and Pineywoods that were settled by Titus phase populations.

The Tuinier Farm site is the closest of the three sites to the headwaters of Stouts Creek. It is situated on a relatively flat and sandy upland ridge (460 feet amsl) about 1 km south of the Anglin site and just east of Stouts Creek. Anglin is on a sandy knoll (460 feet amsl) on an upland slope, also east of Stouts Creek. The third site, R. A. Watkins, is 1.2 km northwest of the Anglin site, also on an upland slope, but 200 m east of an intermittent tributary to Stouts Creek (Figure 1) and 1 km from Stouts Creek.

HISTORY OF EXCAVATIONS AND CHARACTER OF THE SITES

The Tuinier Farm, R. A. Watkins, and Anglin sites were located and recorded by Lee Green between 2004-2007 during survey investigations of the Stouts Creek valley around the small community of Pine Forest (see Figure 1). All three are Late Caddo period, Titus phase, habitation sites with midden deposits, either now in pasture, or in a recently cultivated field in the case of the Tuinier Farm site.

Shafer and Green (2008) report on the excavation of a Woodland period biface cache from a borrow pit area at the southern end of the Tuinier Farm site. Three Late Caddo burials were also encountered in the borrow pit area. At the Tuinier site in 2007, in addition to obtaining general surface collections in recently plowed fields (Figure 2a-b) from two visible midden-stained areas (Middens 1 and 2 or South and North middens, respectively) about ca. 30 m apart as well as areas with surface concentrations of artifacts some distance north of the borrow pit area, we excavated a number of shovel tests and several 1 x 1 m units near shovel tests with quantities of archaeological materials. This includes ST 1-6 and Units 1-4; Unit 4 was a

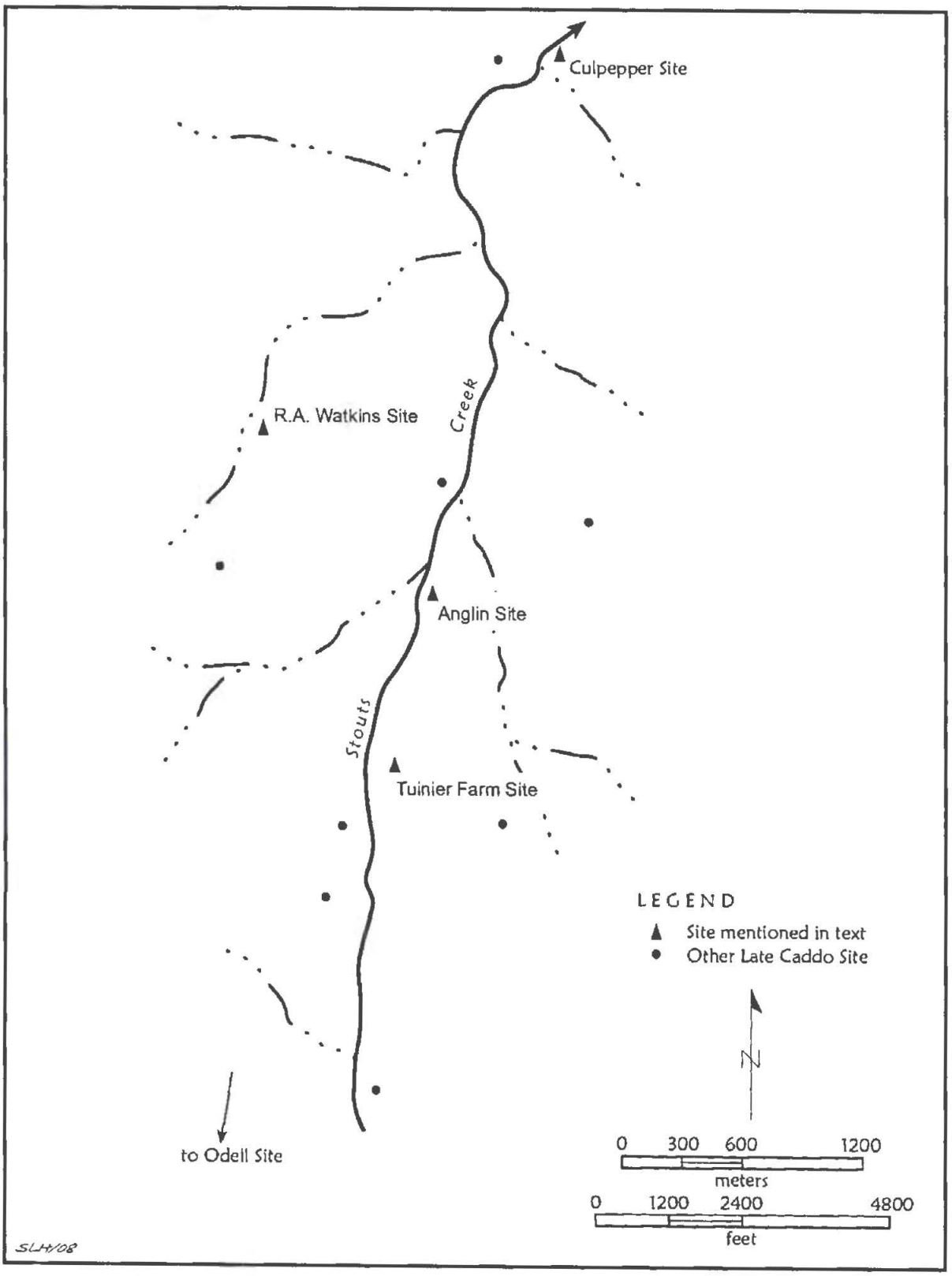


Figure 1. General location of the Tuinier Farm, Watkins, and Anglin sites in the Stouts Creek basin.

a

b

Figure 2. Photographs of Tuinier Farm in 2007: a, looking east with southern midden area in the center of photograph; b, looking south.

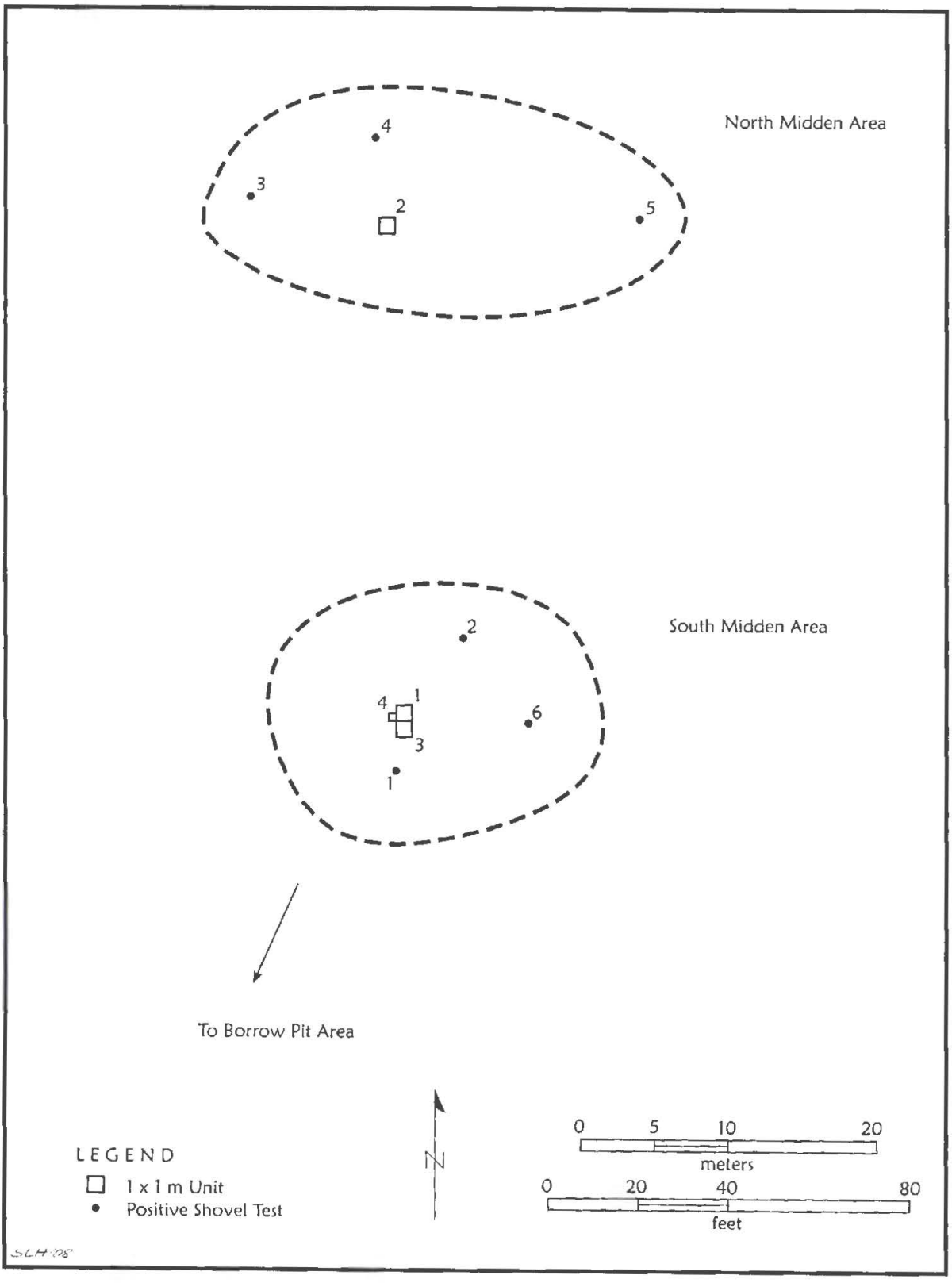


Figure 3. 2007 excavation areas at the Tuinier Farm site.

40 x 40 cm unit excavated to obtain flotation and fine-screen samples from the South midden. Units 1, 3, and 4, and ST 1, 2, and 6 were excavated in the area of the South midden or Midden 1. In the North midden (Midden 2), we excavated ST 3-5 and Unit 2 (Figure 3).

Midden deposits (very dark grayish-brown sandy loam) between 20-34 cm in thickness were identified in ST 1 (South midden or Midden 1), ST 2 (South midden or Midden 1), ST 4 (North midden or Midden 2), and ST 6 (South midden or Midden 1) at the Tuinier Farm site. In the South midden, the midden archeological deposits ranged from the surface to 23-25 cm bs in Unit 1 and 3 excavations. The North midden deposits extended to a maximum of 30 cm bs in Unit 2. A yellowish-brown sandy loam E-horizon underlay both the South and North middens at the Tuinier Farm site.

The R. A. Watkins site is a Late Caddo midden site; the midden mound is about 15 m in diameter. We conducted no excavations here but studied a small surface collection of artifacts (n=201) with ceramic sherds, burned clay, daub, clay objects, and a few pieces of lithic debris.

Prior to our work at the Anglin site in February 2007, an area ca. 11 x 11 m in size had been excavated over the past several years by Lee Green and associates in and around a well-preserved midden deposit about 10 m in diameter on a sandy knoll (Figure 4). These excavations were done in various sized units, sometimes with excavations by levels, but for our purposes here, the collections from those excavations are treated as a single provenience unit since they come from a small and discrete midden deposit. The 2007 archaeological work focused on identifying remaining unexcavated and undisturbed midden deposits at the site and on a smaller knoll about 25 m to the north. For this, we excavated two shovel tests (ST B and C) on the small northern knoll and ST 1-2 and Units 1-3 (1 x 1 m in size) along the northern, southern, and western margins of the midden deposits (Figure 4). Unit 1 was excavated to 20 cm bs in 10 cm levels, but was terminated when no midden deposits were encountered. The situation was the same in Unit 2, except it was excavated to 25 cm bs in three arbitrary levels. Unit 3 did encounter undisturbed midden deposits in the southern half of the unit from 0-35 cm bs. These midden deposits are a very dark brown (10YR 2/2) sandy loam, and they rest on a yellowish-brown (10YR 4/6) sandy loam E-horizon.

RADIOCARBON DATES

Two radiocarbon dates have been obtained from the Tuinier Farm site. The samples submitted for radiocarbon analysis are charred Hickory (*Carya* sp.) nutshells from Unit 4 flotation samples (10-20 cm and 20-30 cm bs) in the South midden.

The calibrated intercepts suggest that the Caddo occupation at the Tuinier Farm (or at least that part of the South midden occupation in the vicinity of the Unit 4 archaeological deposits) may have begun as early as the mid-15th century A.D. and lasted until the mid-17th century A.D. At 2 sigma (95% probability), the two calibrated radiocarbon dates overlap between AD 1520-1630 (Table 1), and this is considered the most likely chronological range of the domestic Caddo occupation at Tuinier Farm; the burials at this site may be younger than that based on the presence of a mid-17th century style Taylor Engraved inverted rim carinated bowl (see below). The R. A. Watkins and Anglin sites appear to be contemporaneous with the Tuinier Farm Caddo occupation, based upon an examination of the range and styles of the decorated ceramic sherds found at each site (see below).

Four sherds from the Tuinier Farm site are to be submitted for thermoluminescence (TL) dating, but the results are not expected to be in hand until mid-2009 (Dr. James Feathers, September 2008 personal communication). The TL dating of Caddo sherds is in its infancy, but good results (i.e., the TL dates are comparable to the calibrated ages received through radiocarbon dating of charred plant remains from the same archaeological deposits) have recently been obtained from the Lang Pasture site (41AN38) in the upper Neches River basin in East Texas (Feathers 2008; Perttula 2008).

MATERIAL CULTURE REMAINS

The prehistoric and historic[1] material culture remains analyzed at the three sites (not including bone and shell artifacts discussed below), 6766 artifacts in total, is a product of the prior work (excavations and surface collections) by Lee Green and associates combined with the limited shovel testing and hand-controlled excavations at the Tuinier Farm and Anglin sites. Material remains are the three sites are abundant, particularly ceramic vessel sherds (Table 2), as these account for at least 80% of all the analyzed artifacts from the Stouts

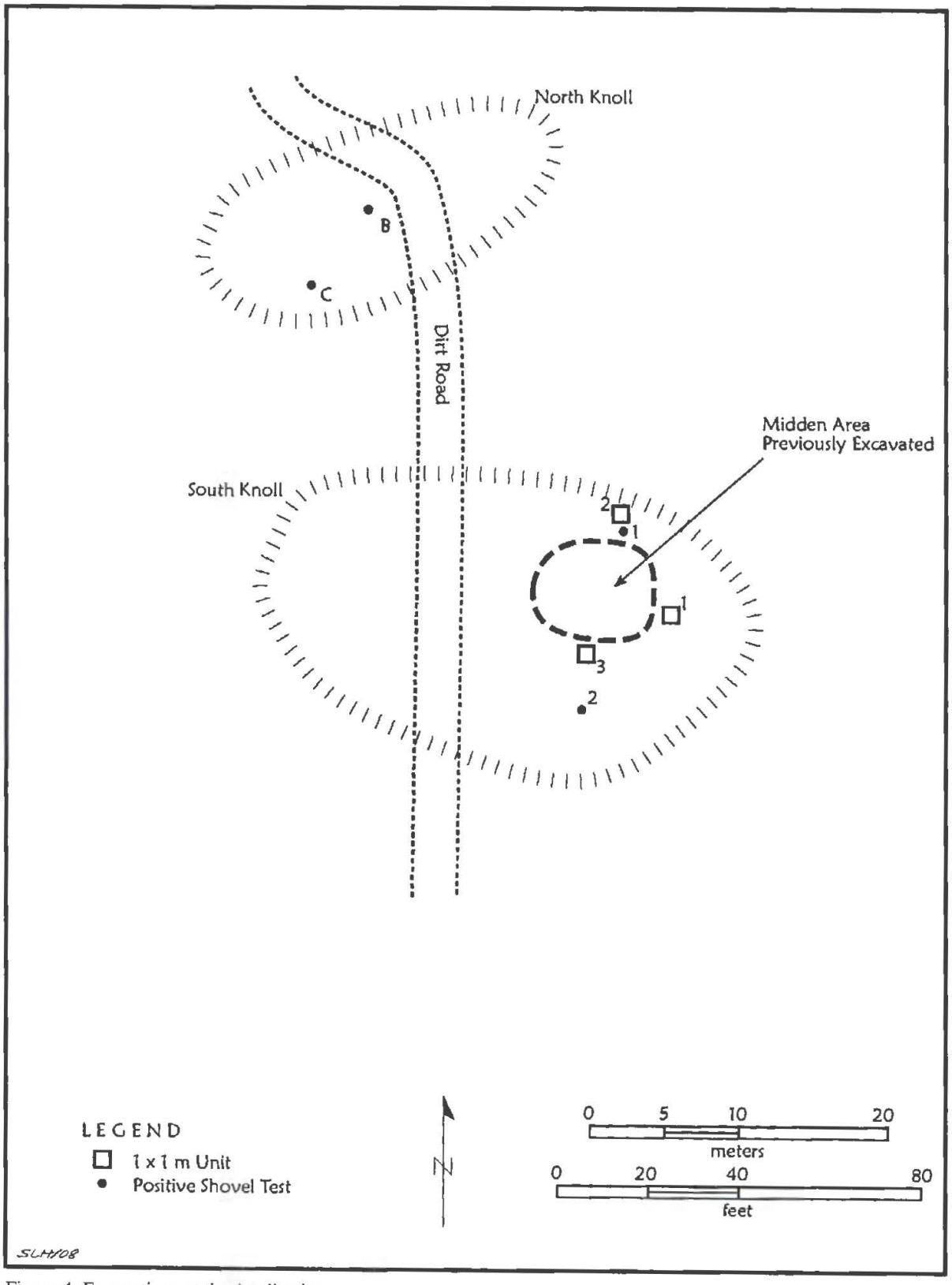


Figure 4. Excavations at the Anglin site.

Table 1. Radiocarbon dates from the Tuinier Farm site.

Beta No.	Provenience	Conventional radiocarbon age (B.P.)	Calibrated intercept*	Calibrated 1 sigma age range	Calibrated 2 sigma age range
B-239189	Unit 4, 10-20 cm bs	260 ± 40	AD 1650	AD 1640-1660	AD 1520-1590 AD 1620-1670 AD 1770-1800 AD 1940-1950
B-239188	Unit 4, 20-30 cm bs	400 ± 40	AD 1460	AD 1440-1490	AD 1430-1530 AD 1560-1630

*calibrated following Reimer et al. (2004) and IntCal04.

Table 2. Material culture remains from the Stouts Creek sites.

Category	Tuinier Farm	R. A. Watkins	Anglin
Lithic debris	51	6	120*
Tools	7	–	–
Daub	1	6	214
Burned clay	48	6	638
Clay object	9	1	72
Ear spools	–	–	8
Plain sherds	460**	141**	3259
Decorated sherds	283	42	1347
Pipe sherds	6	–	4
Historics	25***	–	2+
Totals	900	202	5664++

* a large sample of lithic debris was found at Anglin in the earlier excavations, but they have not been counted or analyzed since they come from unprovenienced contexts within the midden there; **includes a perforated sherd (spindle whorl); ***cut nails; +=glazed brick fragments; ++=does not include the lithic debris from the earlier investigations

Creek sites (83% at the Tuinier Farm site, 91% at the R. A. Watkins site, and 81% at the Anglin site). Burned clay and daub is well represented at the Anglin site, as are clay objects and ear spools. Elbow pipe sherds are present at both the Tuinier Farm and Anglin sites (Table 2).

Based on the limited amounts of lithic debris found in the 2007 investigations, the knapping of stone tools was not an important activity at the Tuinier Farm site during Late Caddo times, as is often the case at other Titus phase sites (Perttula 1998:80), but may have been a more common task

during the Late Caddo occupation at the Anglin site. This is not properly reflected in the small sample of lithic artifacts studied for this analysis since at least 2000 pieces of lithic debris have been previously collected from the Anglin site during earlier unprovenienced excavations in the midden deposits here. The relative abundance of chipped stone arrow points, and the residue of chipped stone tool manufacture, suggests that the Caddo peoples living here were taking and processing large amounts of hunted resources, perhaps even engaging in long-distance hunting in the nearby tall grass prairies to the west as well as focusing on game animals that favored the forested woodlands. The Anglin hunters may have taken advantage of the accessibility (compared to the Pineywoods Caddo) of good hunting areas in the upper Sulphur River basin and the possibility that—due at least in part to changing and drier climatic conditions—small herds of very large game animals would have been available for procurement (see discussion in Perttula and Sherman 2008:303-304).

Ceramic Vessels

A total of 15 vessels and partial vessels have been recovered by Lee Green and associates from three Caddo burials discovered in the disturbed borrow pit area at the Tuinier Farm site; no information is available on which vessels were found together in the three burials. These vessels include:

two Taylor Engraved carinated bowls (5.2 and 8 cm in orifice diameter) with direct rims;
a late (mid-17th century) style inverted rim Taylor Engraved carinated bowl (cf. Perttula 2007) with red pigment rubbed in the engraved lines (21 cm in orifice diameter) (Figure 5a);
two Simms Engraved carinated bowls (11.2 cm and 12.3 cm in orifice diameter) (Figure 5b-c);
one Simms Engraved deep bowl with a coarse sandy paste;
two Ripley Engraved carinated bowls with an interlocking horizontal scroll motif (16 cm and 21.8 cm in orifice diameter) (Figure 5d-e);
two Ripley Engraved carinated bowls with continuous scroll motifs (19 cm in orifice diameter on one vessel; the other vessel is fragmentary: it also has an inverted rim (Figure 5f-g);
a shell-tempered Hudson Engraved spool-necked bottle (17 cm in height) (Figure 5h);
an everted rim McKinney Plain jar (16 cm in orifice diameter) with four rim nodes and appliqued ridges (Figure 5i);
a LaRue Neck Banded jar with appliqued chevrons on the vessel body;
a second LaRue Neck Banded jar (20.2 cm in orifice diameter) with hatched incised triangles on the vessel body (Figure 5j); and
a fragmentary shell-tempered Nash Neck Banded jar with appliqued chevrons on the vessel body (Figure 5k).

A large section of an everted rim LaRue Neck Banded jar had also been found in Midden 1 or the South midden at the Tuinier Farm site. This grog-tempered jar has 10 rows of neck banding with appliqued chevrons and slash punctates on the vessel body.

Odell Site (41HP239)

The Odell site is a contemporaneous Late Caddo site on Stouts Creek, located a few miles upstream from the Tuinier Farm site. Several whole vessels were documented from the site (presumably the grave goods from a single burial) during the course of our investigation of the Stouts Creek Caddo sites. These include a fragmentary LaRue Neck Banded everted rim jar with four small strap handles (Figure 6a), a Ripley Engraved carinated bowl (23 cm in orifice diameter) with a scroll and diamond motif repeated four times on the rim panel (Figure 6b), and a large grog and shell-tempered Taylor Engraved olla with a slight spool neck (Figure 6c).

Ceramic Sherds

There are about 5530 ceramic vessel sherds in total from the Tuinier Farm (n=743), R. A. Watkins (n=183), and Anglin (n=4606) sites (see Table 2). Between the three sites, the plain sherds (rims, body, and base) comprise approximately 70% of the ceramic sherds (n=3860). There are 1679 decorated rim and body sherds in the collections, 81% from the Anglin site. The plain to decorated sherd ratios (P/DR) at the three sites range from 1.62 (Tuinier Farm) to 3.36 (R. A. Watkins), with a P/DR of 2.42 at the Anglin site. As these ratios suggest, plain ware vessels and/or vessels with

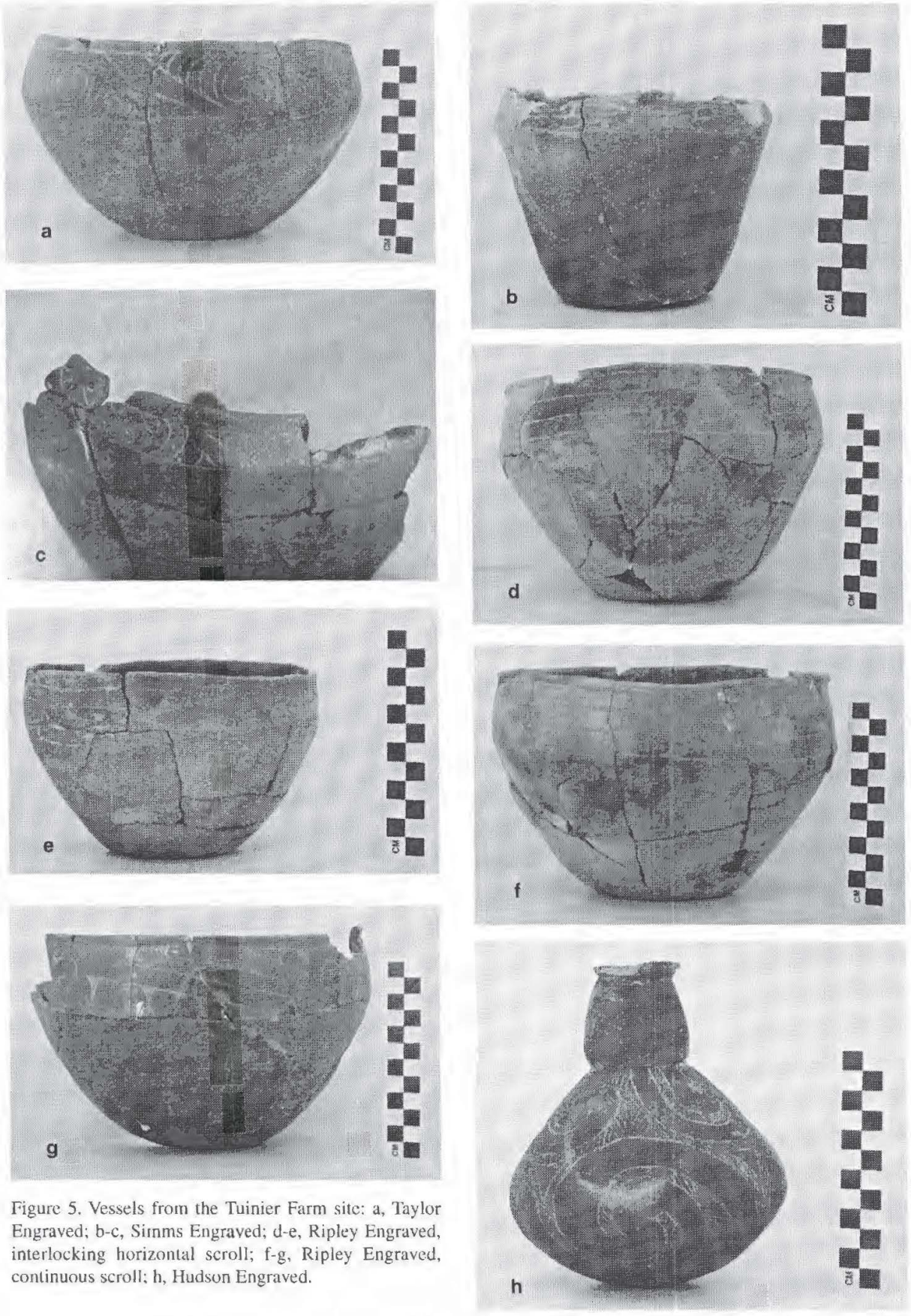
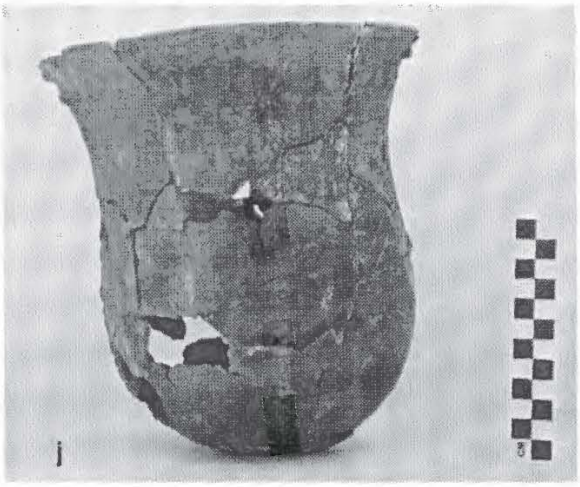


Figure 5. Vessels from the Tuinier Farm site: a, Taylor Engraved; b-c, Simms Engraved; d-e, Ripley Engraved, interlocking horizontal scroll; f-g, Ripley Engraved, continuous scroll; h, Hudson Engraved.



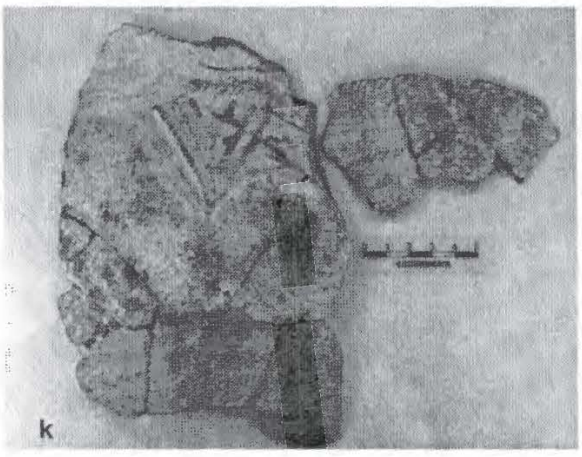
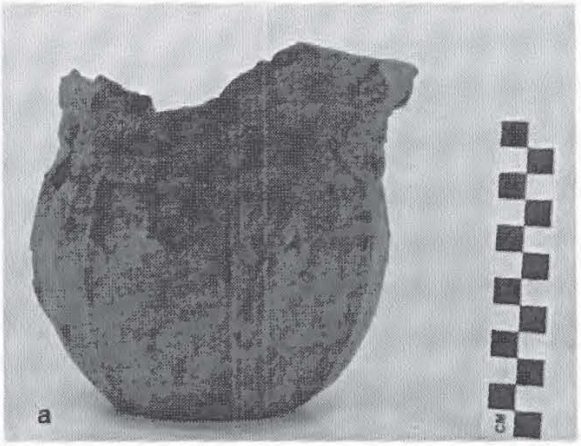
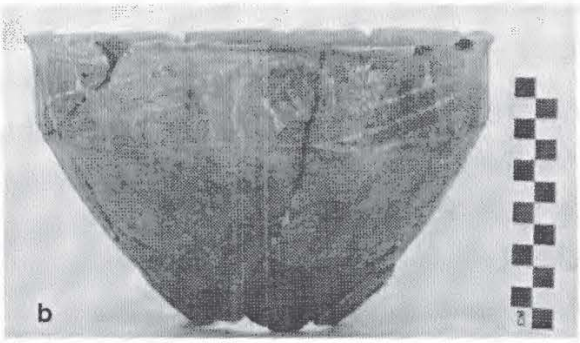


Figure 5, cont'd: Vessels from the Tuinier Farm site: i, McKinney Plain; j, LaRue Neck Banded; k, Nash Neck Banded vessel section.





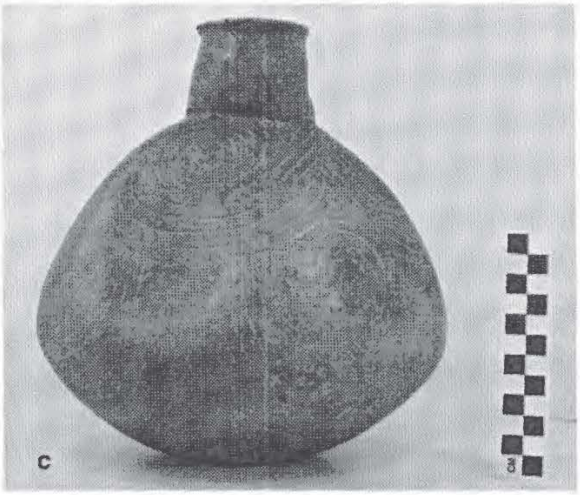


Figure 6. Vessels from the Odell site: a, LaRue Neck Banded jar; b, Ripley Engraved carinated bowl; c, Taylor Engraved olla.

Table 3. Rims from the Stouts Creek sites.

Sites	Plain ware	Utility wares	Fine wares	N
Tuinier Farm	35.4*	17.1	47.6	82
R. A. Watkins	37.5	18.8	43.8	16
Anglin	25.9	24.5	49.6	363

*percentage

Table 4. Decorated sherds from the Stouts Creek sites.

Decorative class	Tuinier Farm	R. A. Watkins	Anglin
Fine wares			
Engraved	58.3*	47.6	44.5
Red-slipped	2.5	7.1	14.7
Trailed	0.4	–	0.1
Lip notched	0.4	–	0.1
Utility wares			
Appliqued	12.4	9.5	16.2
Appliqued-punctated	–	2.4	0.5
Appliqued-incised	–	–	0.1
Neck banded	7.4	21.4	9.9
Neck banded-appliqued	–	–	0.5
Neck banded-punctated–appliqued	–	–	0.1
Corncob impressed	5.7	–	2.9
Corncob impressed-appliqued	–	–	0.1
Brushed	7.1	2.4	2.4
Brushed-appliqued	–	–	0.2
Brushed-punctated	–	–	0.2
Brushed-incised	0.7	2.4	0.6
Brushed-incised–lip notched	–	2.4	–
Punctated	2.5	4.8	4.6
Incised	2.8	–	2.0
Incised-punctated	–	–	0.1
% Fine wares	61.5	54.8	59.5
% Utility wares	38.5	45.2	40.5
Totals	283	42	1347

*percentage

substantial undecorated sections (i.e., undecorated bodies on rim decorated vessels) are relatively abundant at the Stouts Creek sites. Plain ware rims comprise between 25.9-37.5% of all the rims from the three sites (Table 3). The proportions of utility ware and fine ware rims are quite consistent among the three sites, suggesting that the ceramic sherd assemblages from them provide a reasonably robust sample of the character of the domestic Late Caddo ceramics in this locality.

The decorated ceramic sherds from the Stouts Creek sites are dominated by engraved and red-slipped fine wares and neck banded and appliqued utility wares (Table 4). The number of rims of each decorated ware suggest that fine wares are at least twice as common as utility wares in these domestic assemblages. Among all the sherds, many of the fine wares, especially at the Anglin site, apparently have a hematite-rich red slip on both interior and exterior vessel surfaces (Table 4). However, the absence of red-slipped rim sherds in the Stouts Creek sites indicates that, unlike a number of Titus phase assemblages in the Big Cypress Creek basin (Perttula 2005; Nelson and Perttula 2003), there are no plain red-slipped vessels in the former sites, only engraved vessels (usually carinated bowls, but also bottles) that occasionally have red-slipped surfaces. Other fine wares include a few trailed sherds and burnished and/or red-slipped vessel rim sherds with diagonal lip notching.

The decorated utility ware sherds from the Stouts Creek sites can be readily divided into five broad classes: appliqued, neck banded, corncob impressed, brushed, and incised/punctated (see Table 4). The appliqued sherds are primarily from McKinney Plain and Harleton Appliqued jars while the neck banded sherds are from LaRue Neck Banded vessels. These two classes of utility ware pottery together comprise between 51-74% of all the utility wares at the three Stouts Creek sites.

Brushed, corncob impressed (Anglin Impressed, a newly defined Caddo pottery type), and incised/punctated pottery are decidedly secondary decorated utility wares, nowhere accounting for more than 20% of the utility wares at any one site. Brushed pottery comprises between 8.5% (Anglin) and 20% (Tuinier Farm) of the utility wares. Sherds with either punctated, incised, or incised-punctated decorations account for only 11-17% of the utility wares at the Stouts Creek sites.

The corncob impressed sherds are present only at the Tuinier Farm and Anglin sites (7.5-15% of the utility wares). Corncob impressed pottery had been previously identified only from the Spoonbill site (41WD109) in the Lake Fork Creek basin (Bruseth and Perttula 1981:Table 5-8 and 82), where it was dubbed "Corn Cobb Incised." The temporal and cultural connotations of this class of pottery at the Spoonbill site were not explored in Bruseth and Perttula (1981), but its recovery at the Stouts Creek sites in 16th and 17th century contexts, and at Spoonbill where material of similar age is known, is consistent with the fact that there is a late Titus phase occupation at Spoonbill (Walters 2007).

Tuinier Farm

Engraved and red slipped fine ware vessel sherds account for 60.8% of all the decorated sherds at the Tuinier Farm site (see Table 4). Other fine wares include a lip notched rim and a single body sherd with a curvilinear trailed line (Keno Trailed?, see Figure 10a, below).

About 91% of the engraved fine ware sherds where typological identifications are possible are confidently classified as being from Ripley Engraved vessels (Table 5), mostly carinated bowls, based on the kinds of engraved motifs found on the rim panel of vessels (see Thurmond 1990:Figure 6). There is also a smattering of Taylor Engraved and probable Hodges and Womack Engraved types in the Tuinier Farm fine ware sherds. There is one shell-tempered Avery Engraved vessel sherd from a trade vessel that likely was manufactured on a McCurtain phase Caddo site along the Red River, well to the north of the Stouts Creek area. Taken together, the co-association of these engraved fine ware types suggests that the Caddo occupation at the Tuinier Farm site postdates ca. A.D. 1550, and certainly lasted into the 17th century A.D. The occupation could have lasted as late as the mid- to late 17th century given the known chronological age range of Titus phase sites (see Perttula 2005:364-370). The same range of fine ware types has been recovered in the vessels placed as funerary objects in the Culpepper site cemetery (Scurlock 1962:Table 1).

Seven different Ripley Engraved carinated bowl rim motifs are represented in the Tuinier Farm rim and body sherds, with equal numbers of the pendant triangle (n=5), scroll (n=5), and interlocking horizontal scroll (n=6) motifs (Figures 7a-d, 8a, c-e, 9a-c, and 10b-c). Less common rim panel motifs include

Table 5. Engraved sherds from the Tuinier Farm site that can be identified to a particular fine ware type.

Type	No. Rim	Body	Decorative element/motif
Ripley Engraved, total	24	46	
	4	1	pendant triangle motif
	4	1	scroll motif
	1	1	scroll and semi–circle motif
	1	5	interlocking horizontal scroll motif
	1	–	continuous scroll motif
	–	1	nested triangle motif
	13	33	scroll element
	–	1	negative oval
	–	2	circle
	–	1	circle and cross (or swastika–in–circle, see Reilly 2004: Figure 7c), from scroll and circle motif
Taylor Engraved	1	2	graceful opposed curvilinear lines
cf. Hodges Engraved	–	1	curvilinear and hatched zones with tick marks
cf. Womack Engraved	2	–	hatched pendant triangles
Avery Engraved	–	1	narrow hatched zone
Totals	27	50	

the scroll and semi-circle, the continuous scroll, the nested triangle, and the scroll and circle motif.

The pendant triangle motif (see Figures 7c and 8e) is particularly chronologically sensitive, as it is a distinctive stylistic element signifying post-A.D. 1600 Titus phase occupations (see Perttula et al. 1998) in the Big Cypress Creek basin; Maud and Talco points, especially the latter, typically occur on sites with Ripley Engraved vessels having the pendant triangle motif. The scroll motif—and the many scroll element sherds (scroll lines and hourglass-shaped scroll filler elements seen on several distinct and different rim motifs, see Thurmond 1990:Figure 6a-c, e-g)—is a motif commonly used throughout the Titus phase on Ripley Engraved vessels, while the scroll and circle motif is relatively abundant only in later Titus phase contexts (see Perttula 1992:Appendix A). Thus, its occurrence at Tuinier Farm is consistent with the age range suggested above based on the presence of late styles of Ripley Engraved, Taylor Engraved (apparently made and used after ca. A.D. 1550 by Titus phase groups), Hodges Engraved, and 17th century Womack Engraved vessels.

The remainder of the engraved sherds have simple geometric elements or straight line designs (although both of these elements may be from more complex but unidentifiable scroll motifs). These include: horizontal lines (n=11, including seven rims; may be from interlocking horizontal scroll motifs, but no scroll elements identifiable on specific sherds); parallel lines (n=10); opposed lines (n=2); horizontal and diagonal lines (n=1 rim sherd); horizontal and vertical lines (n=1 rim); a hatched zone (n=1); small excised triangles (n=1 rim); panel dividers (n=2); and one body sherd with both circular and rectangular elements (see Figure 10e).

Bottle sherds have curvilinear or concentric engraved lines (n=11) or cross-hatched engraved

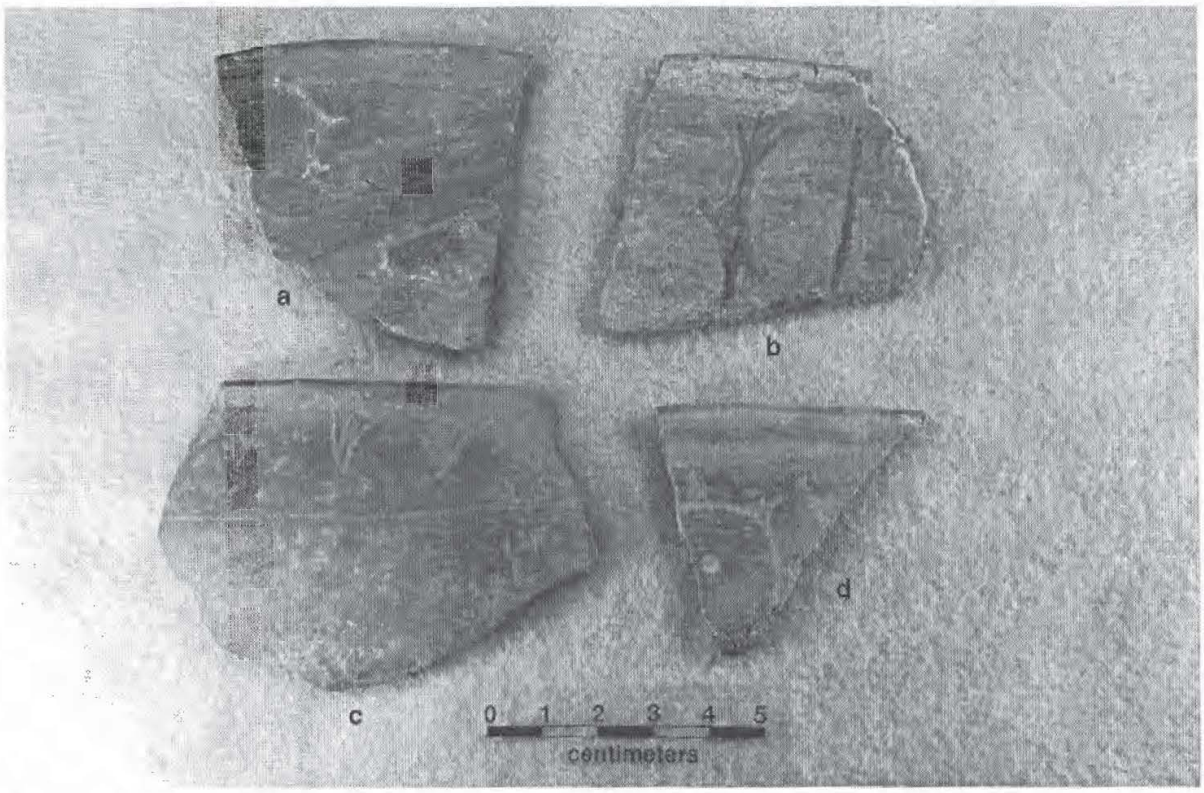


Figure 7. Ripley Engraved rim sherds from general contexts at the Tuinier Farm site.

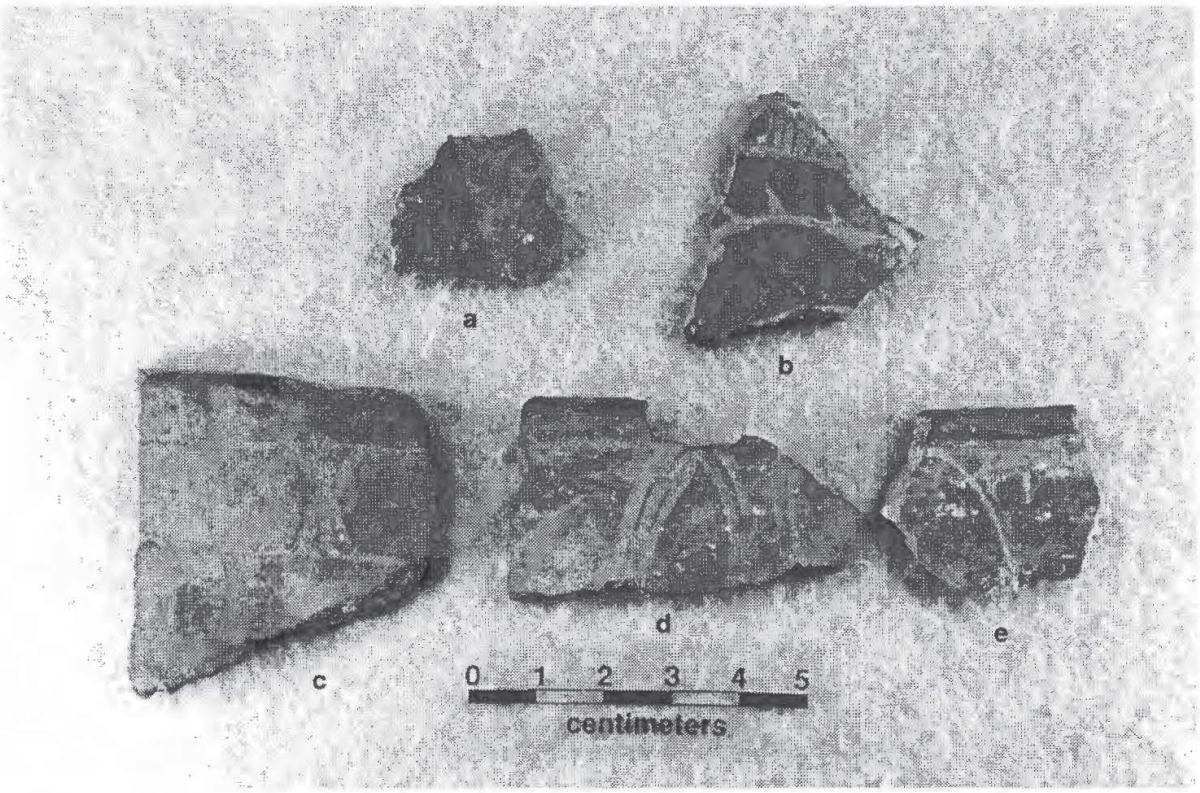


Figure 8. Ripley Engraved and Hodges Engraved rim and body sherds. Provenience: a, surface; b, Unit 2, 20-30 cm; c-d, general surface; e, South midden surface.

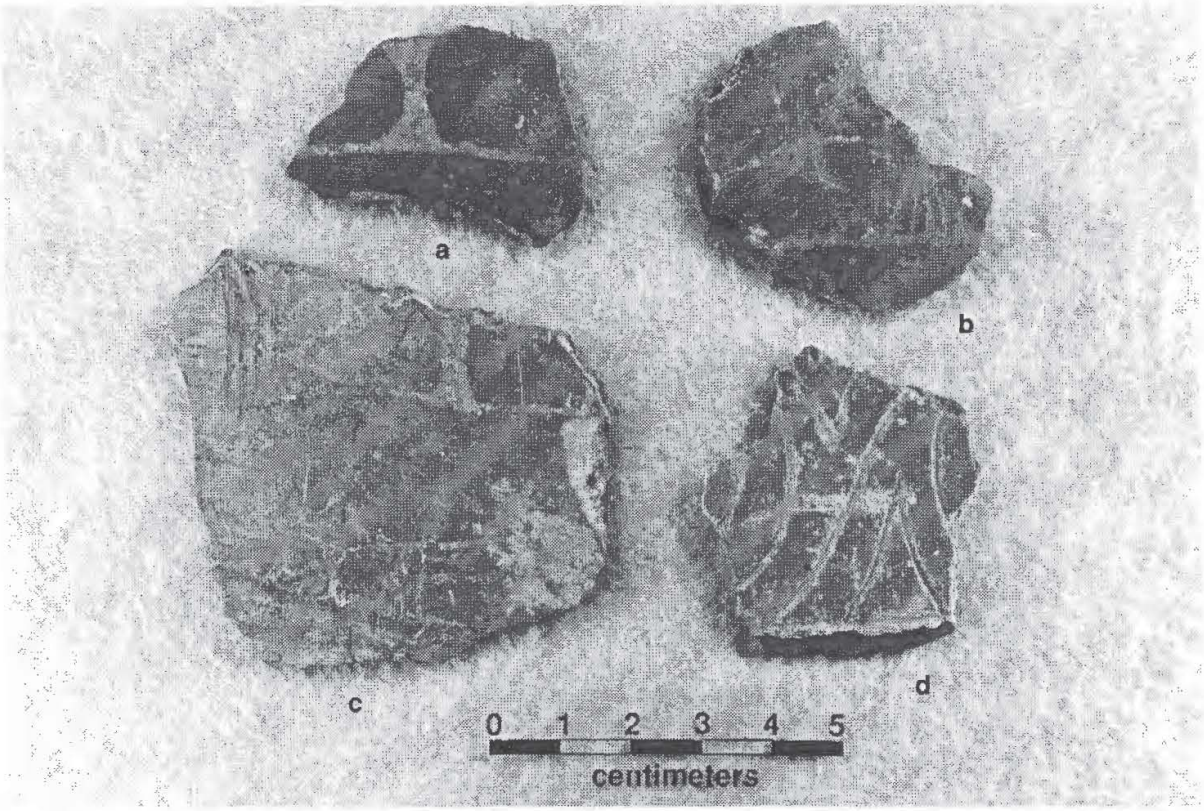


Figure 9. Ripley Engraved and Taylor Engraved body sherds from the Tuinier Farm site. Provenience: a, Unit 2, 10-20 cm; b, Unit 1, 0-10 cm; c, Unit 2, 20-30 cm; d, general surface.

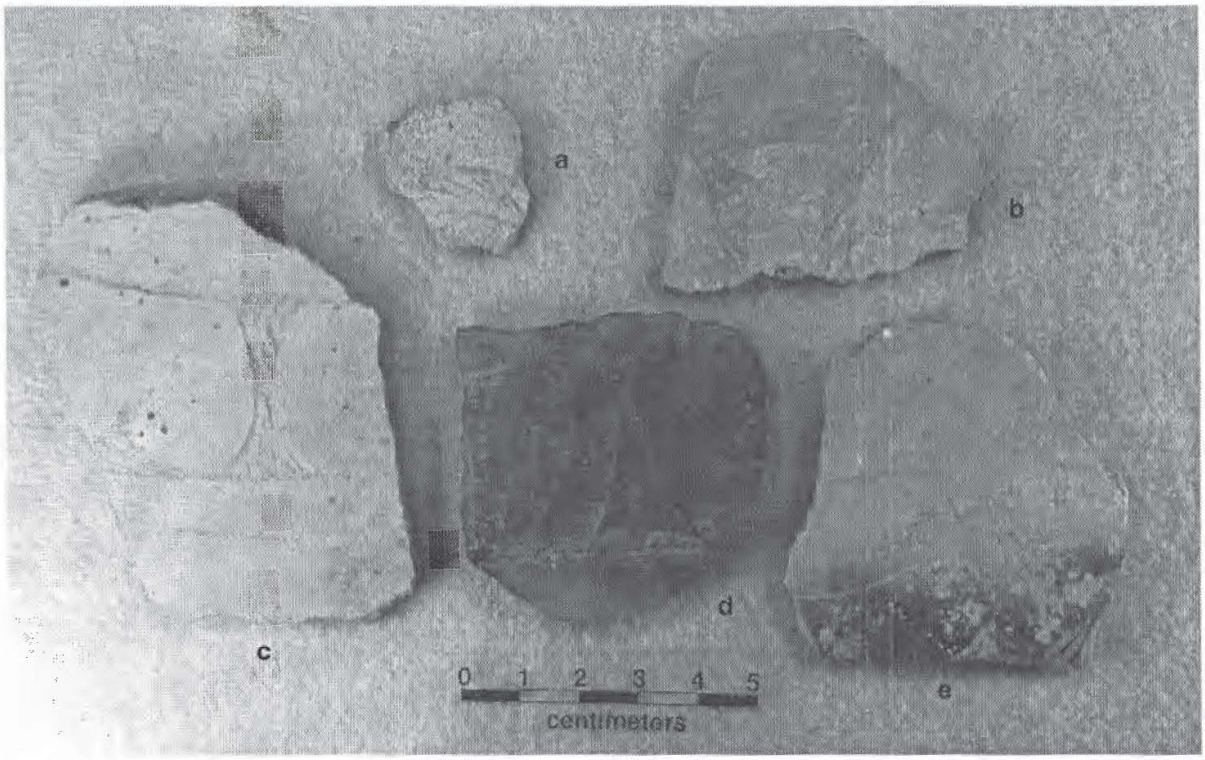


Figure 10. Ripley Engraved, Taylor Engraved, and trailed body sherds from general surface contexts at the Tuinier Farm site.

zones (n=5). Such motifs may be seen on both Ripley Engraved, Taylor Engraved (see Figures 9d and 10d), and Hodges Engraved (see Figure 8b) vessels.

Almost 5% of the engraved sherds from the Tuinier Farm site also have a red-slipped surface. This includes sherds from Ripley Engraved (n=6), Taylor Engraved (n=1), and shell-tempered Avery Engraved (n=1) vessels. Another 6.1% (n=10) of the engraved fine wares have had a pigment rubbed in the engraved design. The vast majority of these sherds have a hematite-rich clay pigment (n=9), but one has a white kaolin clay pigment.

The red-slipped body sherds include five from carinated bowls with a slip on both interior and exterior surfaces and two from bottles that have only an exterior red slip.

Fine ware rim sherds (n=39) at the Tuinier Farm site are almost exclusively direct or vertical in profile (94.8%) and with rounded, exterior folded (48.7%) or rounded (33.3%) lips. There is one inverted rim fine ware sherd as well as one with an everted rim profile. Other distinctive lip forms noted in the fine wares include one with an exterior thickened lip and two other sherds with a flat, exterior folded lip. In toto, exterior folded lips comprise 53.8% of the fine ware rims, compared to only 13.8% of the plain ware rims and 21.4% of the utility ware rim sherds.

The utility ware sherds from the Tuinier Farm site are from jars that were likely used for cooking and storage tasks during the Caddo occupation there. As previously mentioned, utility ware vessels decorated with appliqued or neck banded elements are most prevalent (see Table 4).

The appliqued sherds from McKinney Plain vessels include one lower rim sherd with curvilinear appliqued strips forming a lug handle (Figure 11a), large nodes (n=3), straight appliqued ridges—up to three closely-spaced parallel ridges (n=19, Figure 11c, f)—that apparently extend from the lower rim vertically down the vessel body, single to multiple curvilinear appliqued ridges on the vessel body (n=6, Figure 11d), and appliqued fillets (n=3). There are also two sherds of Harleton Appliqued with appliqued chevrons (applied beginning immediately below the rim-body junction and extending in some cases well down the vessel body, see Suhm and Jelks 1962:Plate 33d, f-g) and two others with clusters of small appliqued nodes (Figure 11a, e).

The LaRue Neck Banded sherds, rims and lower rim (tabulated with the body sherds), have broad horizontal neck banded or corrugated coils that

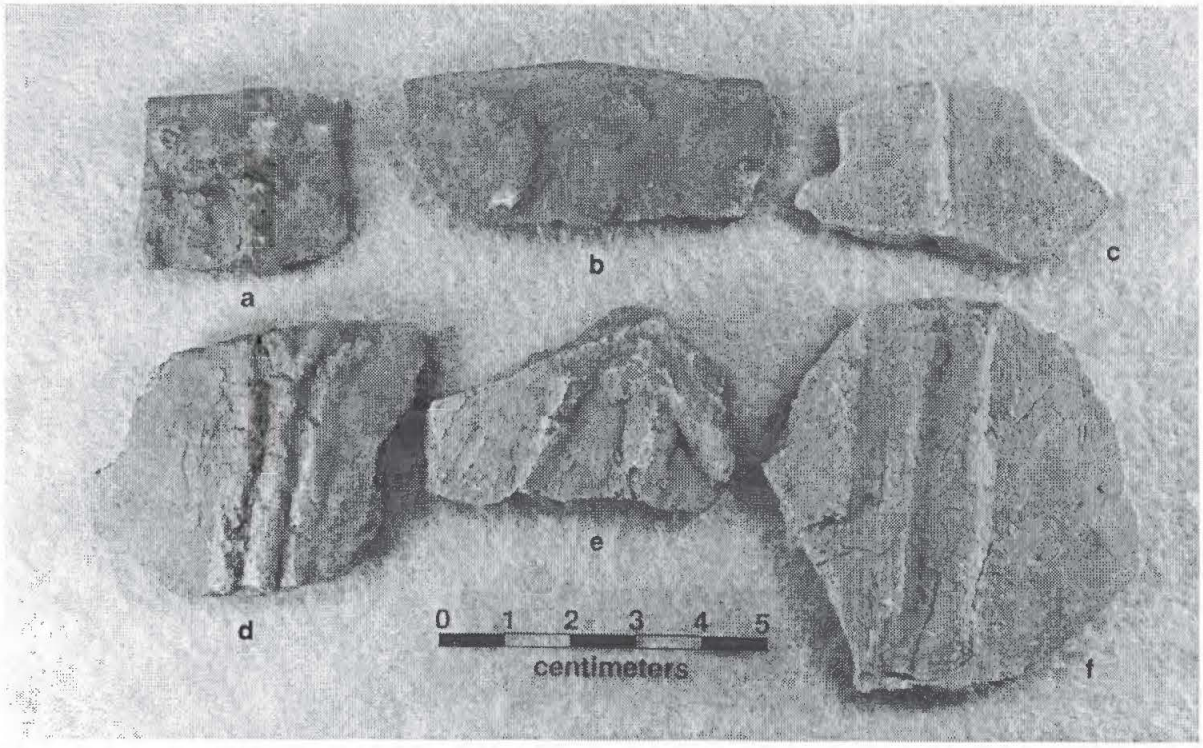


Figure 11. Appliqued sherds from the Tuinier Farm site. Provenience: a-b, d-e, general contexts; c, Borrow pit area, 2004; f, Unit 2, 20-30 cm.

encircle the rim of jars; there may be as many as four to five horizontal neck bands on these vessels (Figure 12c-d). One body sherd has very finely-executed and closely spaced neck banded strips where the corrugations are very distinct (Figure 12a).

The brushed sherds are probably from Bullard Brushed jars. They include one rim with horizontal brushing marks, another with vertical brushing (Figure 13a) on the rim, and 18 parallel brushed body sherds (Figure 13b-c). Although the orientation of these body sherds on vessels is uncertain, it is likely that the brushing marks run vertically on the vessel body, extending to near the vessel base. Also included in the brushed sherds category are two other body sherds. One of these has parallel brushed and shallow incised lines on it; the other has parallel brushed marks and incised lines on either side of a single straight appliqued ridge. This appliqued ridge likely is oriented vertically on the vessel body, dividing it into panels filled with vertical brushing and incised lines.

The Anglin Impressed or corncob impressed rim (n=2) and body (n=13) sherds are marked by roughly parallel or horizontal rows of impressions created by rolling a corn cob across the wet surface of an unfired jar (Figure 14b-c). One Anglin Impressed rim also has an appliqued handle (Figure 14a).

The punctated sherds include both tool (n=6) and fingernail (n=1) elements, typically horizontal rows of punctations encircling the rim (see Figure 12b). These are from jars that Suhm and Jelks (1962:Plate 79) called "Misc. Fulton Utility Pottery." Based on the analysis of whole vessels from Titus phase cemeteries in the Big Cypress Creek basin, Perttula et al. (1998) suggested these punctated vessels—decorated only on the rim with rows of punctations)—be called Mockingbird Punctated. None of the Tuinier Farm sherds are large enough to confidently identify any of them as being from Mockingbird Punctated vessels.

The few incised body sherds have simple straight lines, either parallel lines (n=4) or single straight lines (n=4). Perhaps these are from a Maydelle Incised vessel.

The utility ware rim sherds (n=14) in the Titus phase ceramics at the Tuinier Farm site are evenly divided between direct/vertical and everted rim profiles. Most of these have a rounded lip (57.1%)

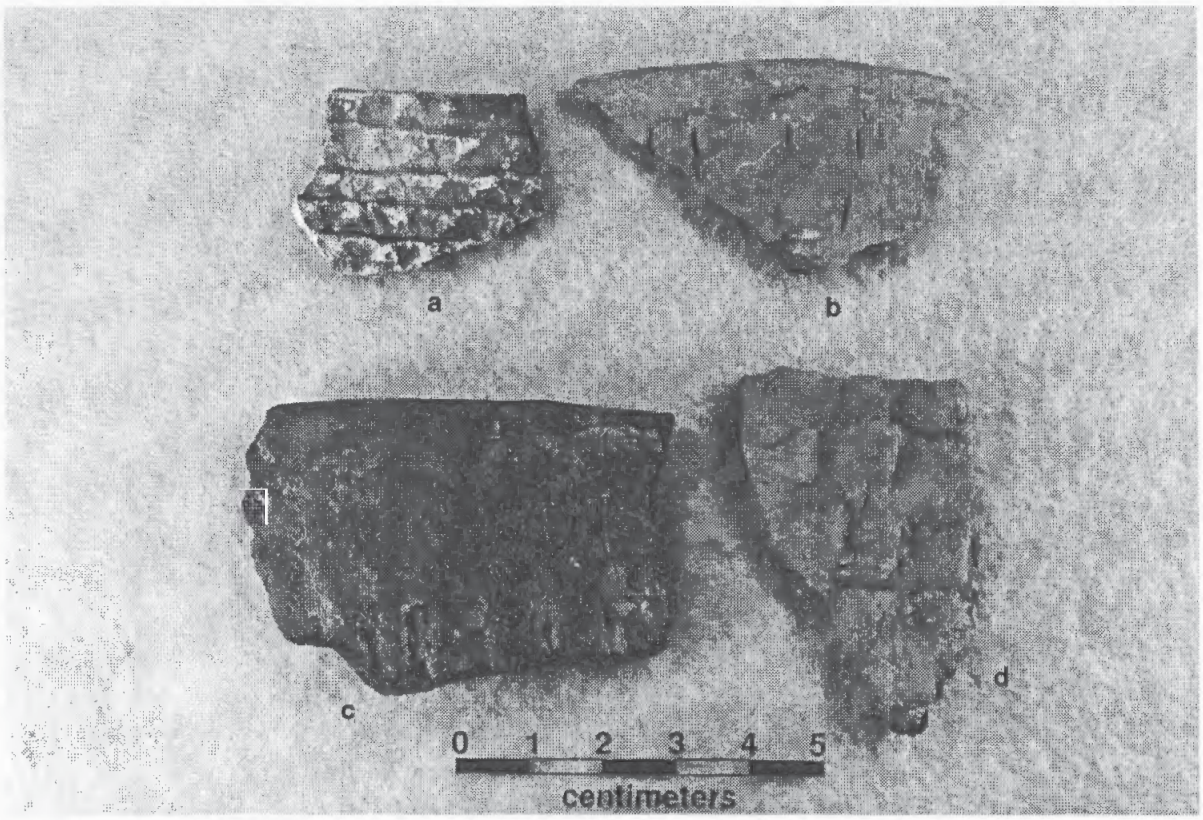


Figure 12. Neck banded and punctated sherds from the Tuinier Farm site: a, c-d, neck banded; b, rim punctated. Provenience: a-d, general contexts.

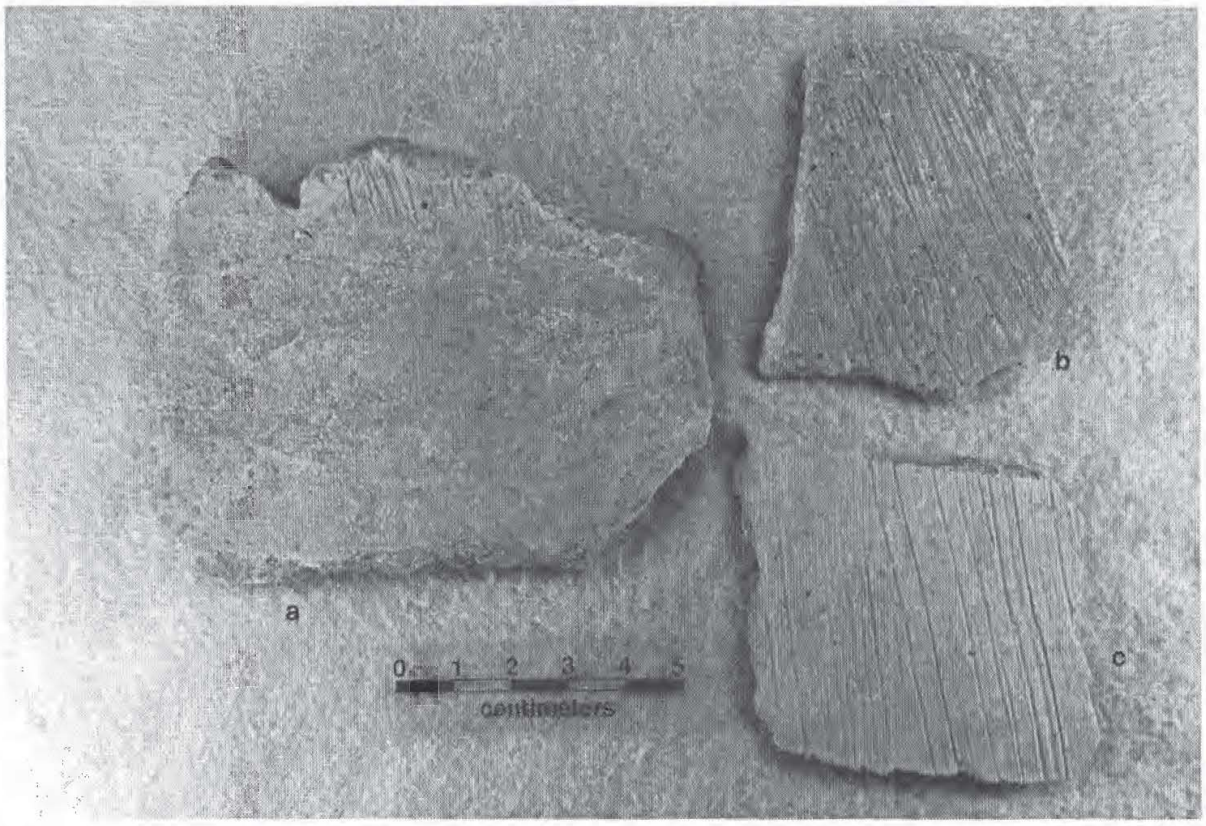


Figure 13. Brushed sherds from the Tuinier Farm site. Provenience: a-c, general contexts.

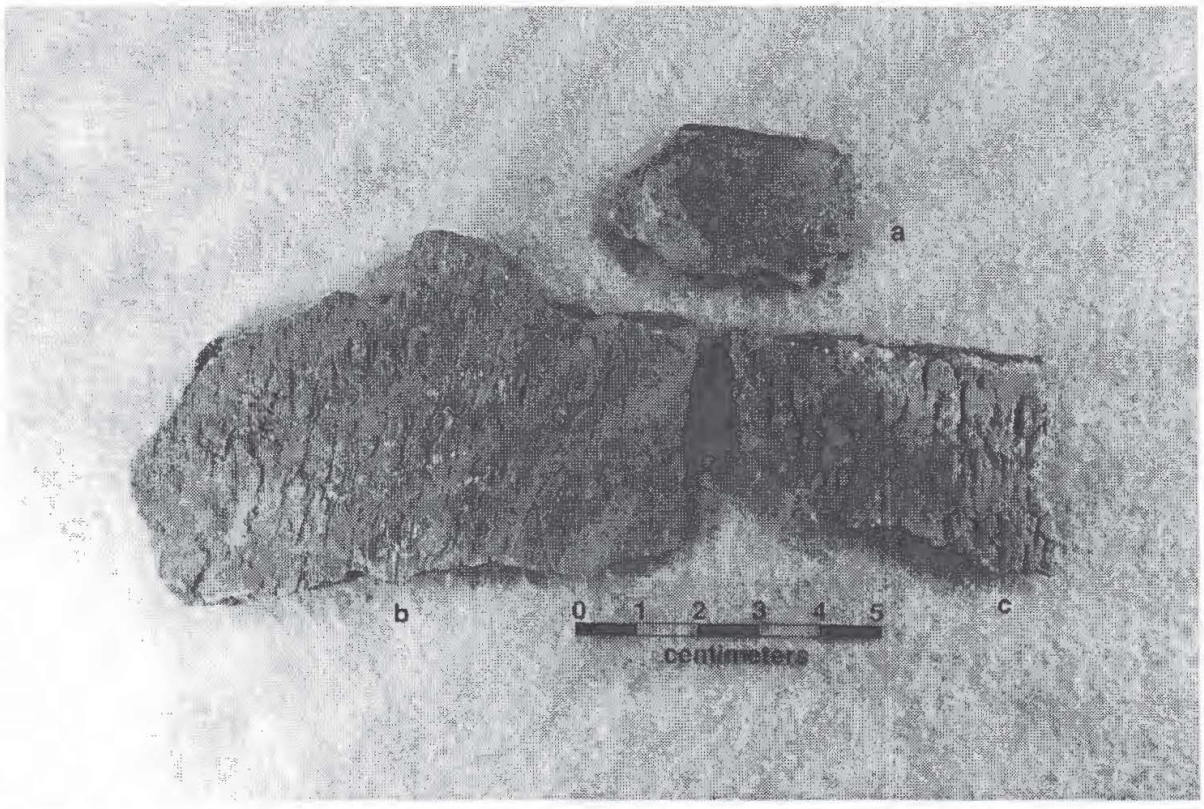


Figure 14. Anglin Impressed sherds from the Tuinier Farm site. Provenience: a, c, general contexts; b, Unit 1, 10-20 cm.

or a flat lip (21.4%), and not many have had their lips folded to the exterior of the vessel as otherwise commonly noted on the fine ware vessels.

There is one distinctive incised rim sherd from the Tuinier Farm site, from the borrow pit area, that is not from the 16th and 17th century Caddo occupation. This is a grog-tempered Coles Creek Incised rim with a single lip line. Not enough of the rim remains to determine the placement or execution of horizontal incised lines on the rim itself, and there are a number of varieties of Coles Creek Incised that have lip lines (Phillips 1970). Those varieties that may have only a single lip line include *var. Stoner*, *var. Phillips*, and *var. Campbellsville* (Brown 1998:8). According to Brown (1998:52-53), Coles Creek Incised *var. Phillips* and *var. Stoner* date from ca. A.D. 300-700 contexts in the lower Mississippi Valley, while the *var. Campbellsville* is found in ca. A.D. 700-1000 contexts. Considering that there is a substantial Woodland period component in the borrow pit area (see Shafer and Green 2008), this one Coles Creek Incised rim may be from either a *var. Phillips* or *var. Stoner* vessel.

The plain sherds from the Tuinier Farm site include 29 rims, 398 body sherds, and 33 sherds from flat disk bases. The variety in rim and lip profiles of the plain rims suggest that plain jars, bowls, and carinated bowls were made and used at the site. Of the 29 rims, one is from a bowl with an inverted rim, 19 bowl and carinated bowl rims have direct or vertical profiles (Figure 15b-c, e), and there are six everted rims (Figure 15d) from plain jars. Lip forms are very commonly rounded (n=21, 72%), likely from bowls and jars, flat (n=4, 13.8%), and rounded and exterior folded (n=4, 13.8%); these latter rims (Figure 15a) are likely from plain carinated bowls.

The ceramic vessel sherds from the Tuinier Farm site are tempered almost exclusively with grog, either as the sole temper, or in small amounts in combination with hematite, bone, or charred organic materials (Table 6). Less than 2% of the sherds have a shell temper, and these are from Red River McCurtain phase trade vessels. Between 7-17% of the sherds by ware have a naturally sandy clay paste, with the highest proportions among the utility wares and the plain ware sherds. The fine wares are more commonly tempered with bone or hematite than either the utility wares or plain wares (see Table 6).

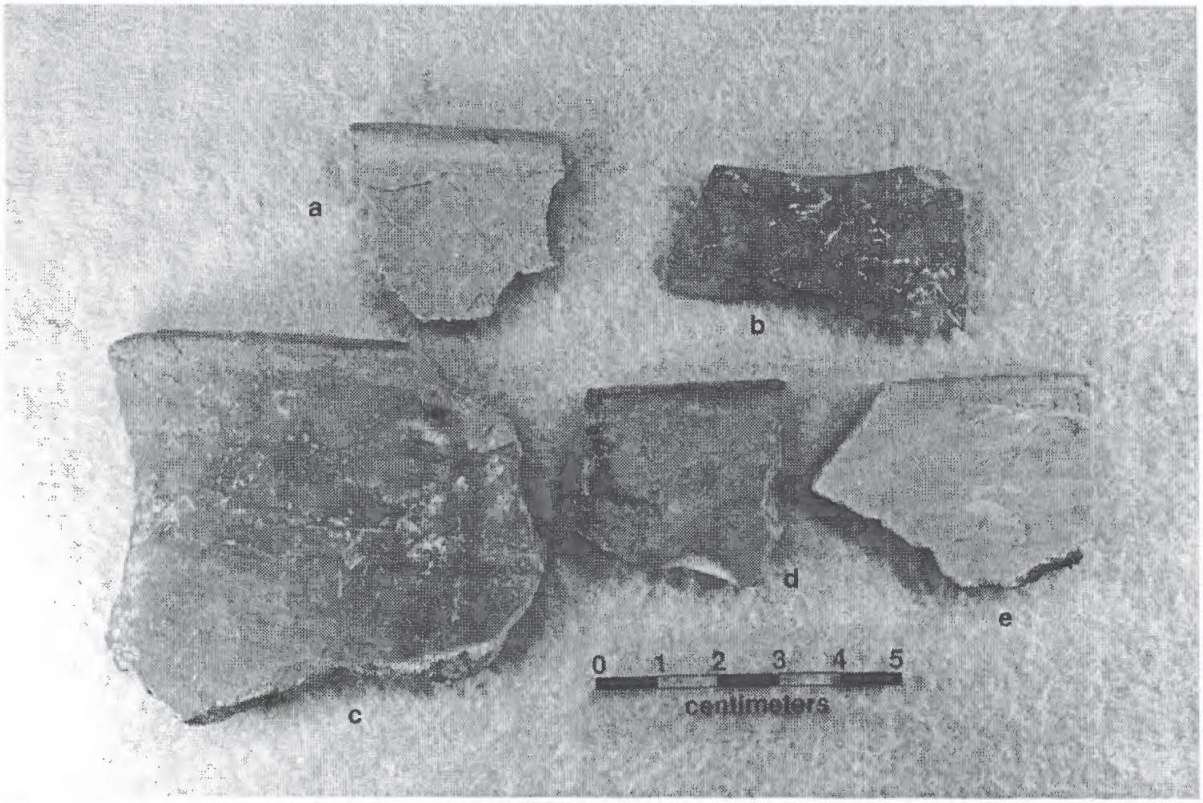


Figure 15. Plain rims from the Tuinier Farm site. Provenience: a, Unit 4, 10-20 cm; b, surface; c, Unit 2, 20-30 cm; d, ST 4, 0-20 cm; e, Unit 2, 10-20 cm.

Table 6. Use of tempers in the Tuinier Farm sherd collection.

Temper category	Plain wares	Utility wares	Fine wares
grog	77.0*	68.6	70.4
grog/sandy paste	15.0	14.3	3.7
grog-organics	–	5.7	1.9
grog-organics-sandy paste	–	2.9	–
grog-hematite	3.0	2.9	7.4
grog-hematite-sandy paste	–	–	3.7
grog-bone	3.0	5.7	9.3
bone	–	–	1.9
shell	2.0	–	1.9
Summary comparisons			
grog	98.0	100.0	96.2
bone	3.0	5.7	11.2
hematite	3.0	2.9	11.1
shell	2.0	–	1.9
sandy paste	15.0	17.2	7.4
Totals	100	109	54

*percentage

Table 7. Firing conditions of the sherds in the Tuinier Farm collections.

Firing category	Plain wares	Utility wares	Fine wares
Oxidized	17.2%	14.3%	7.4%
Incompletely oxidized	19.2%	14.3%	5.6%
Sooted, smudged, reheated	4.0%	2.9%	-
Reduced	14.1%	22.9%	29.6%
Reduced, but cooled in the open air	45.5%	45.7%	57.5%
Totals	99	109	54

Depending upon the ware, between 59.6% (plain wares) and 87.1% (fine wares) of the ceramic sherds from Tuinier Farm are from vessels that had been fired in a low oxygen or reducing environment (Table 7). The vast majority of these vessels were pulled from the fire to cool in the open air, leaving them with one or both surfaces of the vessels with a lighter (usually a chocolate brown color, at least in the case of the fine wares) color. Those that were left to cool down in a low oxygen environment turned a gray to black color.

Only 13% of the fine wares were fired, or at least were partially fired, in an oxidizing environment. Much higher proportions of the utility wares (31.5%) and plain wares (40.4%) were fired in an oxidizing environment or fired under less well-controlled firing conditions (see Table 7).

R. A. Watkins

There are a total of 183 sherds in the collection from the R. A. Watkins site (see Table 2). This

includes six plain rims, 130 plain body sherds, one drilled body sherd (possible spindle whorl piece) with a 11.6 mm perforation, four base sherds, and 42 decorated sherds. The plain to decorated sherd ratio is 3.36. Plain vessels are apparently a common constituent in the vessel assemblage in use at the site given the recovery of six plain rims compared to 10 decorated rims (three from utility wares and seven from engraved fine wares), accounting for 38% of the rims in the collection. The plain rims are uniformly direct or vertical in profile, with rounded (n=2), rounded-exterior folded (n=3), or rounded-interior beveled (n=1) lip forms. These rims are probably from undecorated bowls and carinated bowls.

Half of the decorated sherds are from fine ware vessels (55%, n=23), including engraved (n=20) and red-slipped (n=3) sherds. The engraved sherds appear to be from at least nine different vessels, seven carinated bowls of the Ripley Engraved type (Figure 16c-e), one Hodges Engraved bottle, and a Taylor Engraved carinated bowl (Figure 16a). Four of the Ripley Engraved vessels recognized in the sherds have had a red pigment rubbed into the engraved motif. Three of the sherds also have an interior/exterior red-slip (Figure 16b). Rim forms are primarily direct in profile, but one has an everted rim (Figure 16e), with rounded (n=3) and rounded-exterior folded (n=4) lips.

The principal decorative motifs on the Ripley Engraved vessels include scrolls, either from continuous scroll or scroll motifs (see Thurmond 1990:Figure 6). These have vertical and hour glass-shaped scroll dividers defined primarily through either excision or cross-hatched engraving as well as vertical engraved lines (see Figure 16b-c, f). Two rims have sets of horizontal engraved lines (see Figure 16d-e), and these either are used to delimit the engraved rim panel motif or may be from Ripley Engraved compound bowls with an upper panel with horizontal engraved lines and a lower panel with a more complicated engraved motif; the sherds are not large enough from the R. A. Watkins site to determine this.

The possible Hodges Engraved bottle sherd has a curvilinear engraved line from a scroll element with a series of tick marks on the line. The Taylor Engraved vessel has a graceful series of intersecting concentric engraved lines (see Figure 16a).

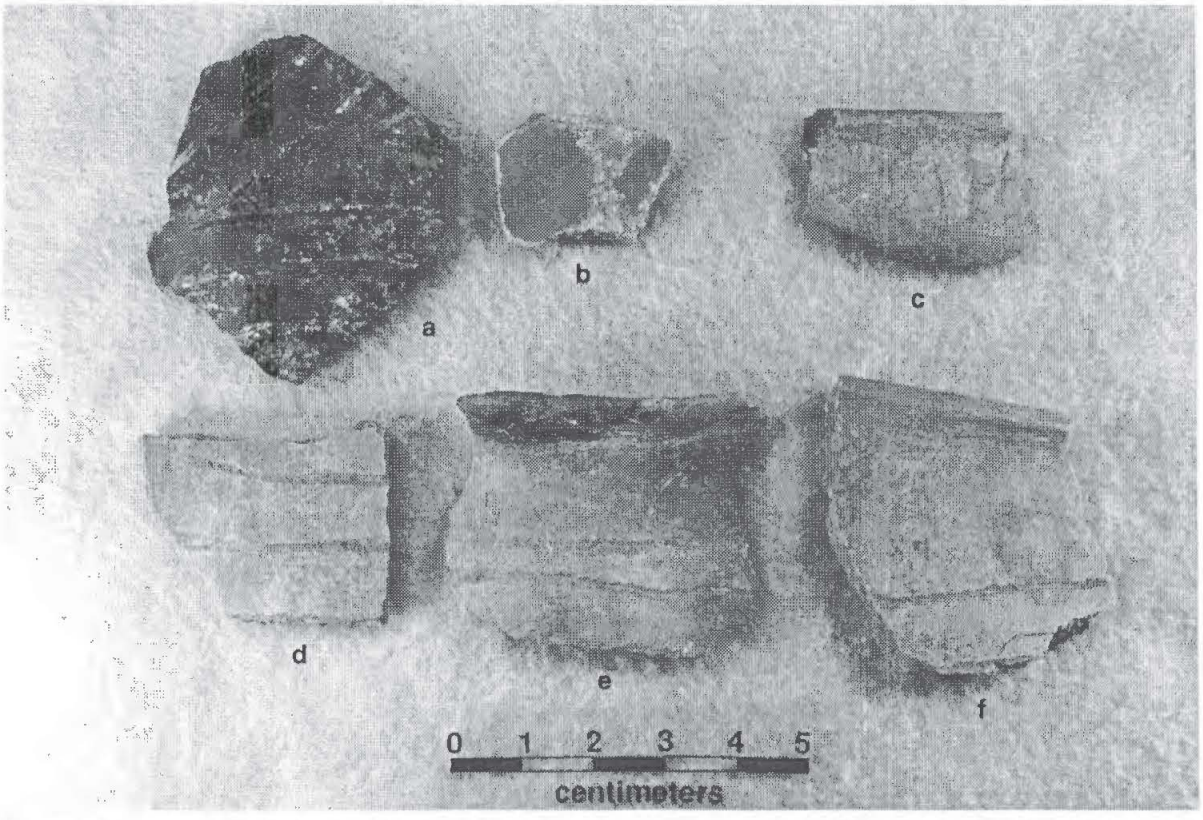


Figure 16. Engraved fine ware sherds from the R. A. Watkins site: a-b, d, body sherds; c, e-f, rim sherds.

The red-slipped sherds include one with only an exterior slip and two others—both-shell-tempered—with interior and exterior red-slipped surfaces. These latter are probably from the undecorated portion of a shell-tempered Avery Engraved or Taylor Engraved vessels or from a plain red-slipped shell-tempered Clement Redware vessel (cf. Flynn 1976).

The other decorated sherds (n=19) are from utility ware jars: neck banded (n=9, including two rims); appliqued (n=5); brushed (n=1); brushed-incised (n=2); and punctated (n=2). The neck banded sherds are from at least two different LaRue Neck Banded jars, one with a direct rim and a flat lip (Figure 17c-d) and the other with an everted rim and a rounded lip. The five appliqued sherds are from McKinney Plain jars with nodes placed around the rim but under the lip (Figure 17a), as well as narrow appliqued ridges and fillets that run vertically on the rim and on the vessel body (Suhm and Jelks 1962:Plate 49e, h).

The less common utility wares include one brushed sherd from the body of a jar, and two brushed-incised sherds: one of these has parallel brushing and incised lines, while the other is a rim with horizontal brushing and a diagonal incised body (see Figure 17b); this rim also has a crimped and notched lip. The two punctated sherds have either tool or fingernail punctated rows.

The ceramic sherds from the R. A. Watkins site are tempered primarily with grog or crushed sherds (Table 8), including both the plain wares and the decorated sherds. Decidedly minor tempers used by Caddo potters include crushed and burned bone, hematite, charred organic materials, and crushed and burned mussel shell; the latter are from red-slipped Avery Engraved vessels made by McCurtain phase Caddo groups on the Red River in northeastern Texas (see Perttula, ed. 2008).

Equivalent amounts of a naturally sandy clay were used by Caddo potters for the manufacture of plain and decorated vessels at the R. A. Watkins site: 17.2-18.8% of the sherds examined in detail (see Table 8). In general, the more heterogeneous temper-paste combinations are characteristic of the plain ware sherds.

The ceramic vessels at the R. A. Watkins site were fired under a diverse set of firing conditions (cf. Teltser 1993:Figure 2; Perttula, ed. 2005). Most were fired under a low oxygen or reducing environment (51.7% of the plain sherds and 68.8%

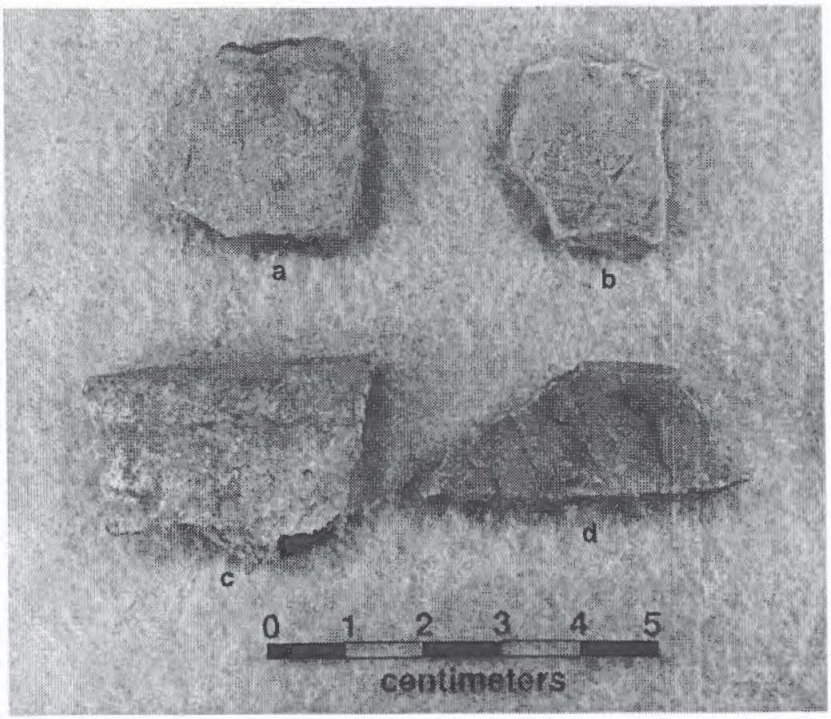


Figure 17. Utility ware sherds from the R. A. Watkins site: a, appliqued nodes (McKinney Plain); b, brushed-incised with a crimped and notched lip; c-d, LaRue neck Banded rim sherds.

Table 8. Use of tempers in the R. A. Watkins sherd collection.

Temper category	Plain wares	Decorated sherds	N
grog	69.0%	68.8%	31
grog-sandy paste	13.8%	18.8%	7
grog-bone	3.4%	–	1
grog-hematite	6.9%	–	2
grog-hematite-sandy paste	3.4%	–	1
grog-organics	3.4%	–	1
shell	–	12.5%	2
Summary comparisons			
grog	100%	87.5%	43
bone	3.4%	–	1
hematite	10.3%	–	3
shell	–	12.5%	2
organics	3.4%	–	1
sandy paste	17.2%	18.8%	8
Totals	29	16	45

of the decorated sherds), especially deriving from vessels that were subsequently removed from the fire and allowed to cool in the open air (Table 9). Less well-controlled firing (i.e., incompletely oxidized or sooted/smudged/reheated firing conditions) was apparently more prevalent among the plain wares than among the decorated sherds analyzed in detail.

Anglin

About 30% of the 4606 sherds from the Anglin site are decorated, including 74% of the rim sherds (see Tables 2 and 3). As with the other Stouts Creek sites, the sherds from the Anglin site are primarily from fine wares (especially Ripley Engraved), as well as McKinney Plain and LaRue Neck Banded vessels, with some brushed and Anglin Impressed jar sherds. With the larger sample size of decorated sherds—both fine wares and utility wares—there are several different classes of sherds found only at Anglin that have distinctive decorative elements and methods of decoration (see Table 4).

The fine wares at the Anglin site total 800 sherds, including 180 rims, primarily if not principally from engraved carinated bowls of several different sizes, along with a few sherds from compound bowls and bottle sherds. Engraved sherds comprise 75% of the fine wares. Other fine wares are represented by burnished red-slipped sherds (24.8% of the fine wares), two lip notched rims (0.3%), and one shell-tempered Keno Trailed sherd (see Tables 3 and 4).

As with the Tuinier Farm and R. A. Watkins sites, Ripley Engraved is the primary engraved fine ware type at the Anglin site. Almost 89% of the engraved carinated bowl, bowl, and compound bowl sherds from the site that can be identified to a defined type are from Ripley Engraved vessels, including 91% of the rim sherds (Table 10). Simms Engraved is a far distant second (5%), followed by a Womack Engraved variant (2.3%), Hodges Engraved (1.9%), Taylor Engraved (1.2%), and Avery Engraved (0.8%). With the exception of the absence of Simms Engraved sherds at the Tuinier Farm site, the proportions of the key engraved types are virtually identical to that seen in the fine ware sherd assemblage from the Anglin site: Ripley Engraved (91%), Womack Engraved variant (2.6%), Avery Engraved (1.3%), and Taylor Engraved (3.9%) (see Table 5).

A variety of Ripley Engraved carinated bowl, bowl, and compound bowl rim motifs (see Thurmond 1990:Figure 6) have been identified in the fine ware sherds from the Anglin site (see Table 10). The principal motifs include the interlocking

Table 9. Firing conditions of the sherds in the R. A. Watkins collections.

Firing category	Plain wares	Decorated sherds	N
Oxidized	31.0%	25.0%	13
Incompletely oxidized	13.8%	–	4
Sooted, smudged, reheated	3.4%	6.3%	2
Reduced	6.9%	31.3%	7
Reduced, but cooled in the open air	44.8%	37.5%	19
Totals	29	16	45

Table 10. Engraved sherds from carinated bowls, bowls, and compound bowls at the Anglin site that can be identified to a particular fine ware type.

Type	No. Rim	No. Body	Decorative element/motif
Ripley Engraved, total	101	130	
	18	9	interlocking horizontal scroll motif
	4	1	scroll motif
	7	–	continuous scroll motif
	–	4	pendant triangle motif
	1	4	nested triangle motif
	3	–	scroll and semi-circle motif
	1	–	scroll and circle motif
	1	1	scroll or continuous scroll motif
	19	25	scroll elements
	8	29	excised scroll filler/divider element
	15	7	straight scroll lines element
	4	16	cross-hatched scroll filler/divider element
	9	4	hatched scroll filler/divider element
	2	12	straight/parallel excised area element
	1	3	panel element
	1	3	circle element (one has an excised triangle perched on the circle)
	1	2	semi-circle element
	2	–	scroll with small pendant triangle element
	–	2	open triangle element
	1	1	cross in circle element
	1	1	circle with dash element
	–	1	cross-hatched circle el.
	–	1	excised circle element
	1	–	horizontal and circle elements
	–	1	curvilinear scroll lines element
	–	1	oval element

Table 10. *(Continued)*

Type	No. Rim	No. Body	Decorative element/motif
Ripley Engraved, cont'd.			
	–	1	curvilinear excised element
	1	–	diamond element
	–	1	hatched ladder (part of diamond motif?)
Taylor Engraved	–	2	gracefully arching concentric lines
	–	1	hooked arm scroll and excised scroll
Hodges Engraved+	–	1*	curvilinear cross-hatched zones and triangles
	–	1	curvilinear lines with tick marks
	–	1	negative ovals and ticked line
	2	–	scroll lines, negative ovals, and tick marks
Simms Engraved**, total	6	7	—
	–	5	parallel lines, one with small tick marks
	–	1	parallel lines, both with tick marks
	1	–	scroll and small tick marks on the underside of the steep rim
	–	1	horizontal line and small tick marks on the underside of the steep rim
	1	–	horizontal scroll and lip notching
	1	–	rectangular panels
	1	–	panels with slashes and small triangles
	1	–	horizontal lines
	1	–	horizontal and diagonal lines; lip notched; inverted rim
Avery Engraved***	–	1	negative ovals and excised areas
	–	1	narrow hatched zone
cf. Womack Engraved	2	2	hatched pendant triangles
	–	2	excised pendant triangles
Totals (n=260)	111	149	

*includes one bottle sherd; **hubcap vessel form (see Suhm and Jelks 1962:Plate 71a-c, f; Skinner et al. 1969:Figures 16c-d and 21a, c); ***shell-tempered; +=there are also two Hodges Engraved bottle sherds

horizontal scroll (n=27 sherds), the continuous scroll (n=7 sherds), the scroll (n=5 sherds), nested triangle (n=5 sherds), and the pendant triangle (n=4 sherds) (Figures 18a-d, 19a-d, 20a-b, and 21c-d); other less common rim motifs include the scroll and semi-circle (n=3) and the scroll and circle (n=1). The presence of the pendant triangle motif on some of the sherds (7.4%) suggests some use of the Anglin site after A.D. 1600 (Perttula 2005, ed.:272), but perhaps not to the extent that the Tuinier Farm was, as 25% of the sherds with an identifiable Ripley Engraved rim motif there have the pendant triangle motif. The interlocking horizontal scroll motif comprises 50% of the sherds with identifiable rim motifs from the site, compared to 30% at the Tuinier Farm (see Table 5).

The interlocking horizontal scroll is not a common Ripley Engraved rim motif in Thurmond's (1990) compilation for Titus phase sites in the Big Cypress Creek basin in Northeast Texas, being found

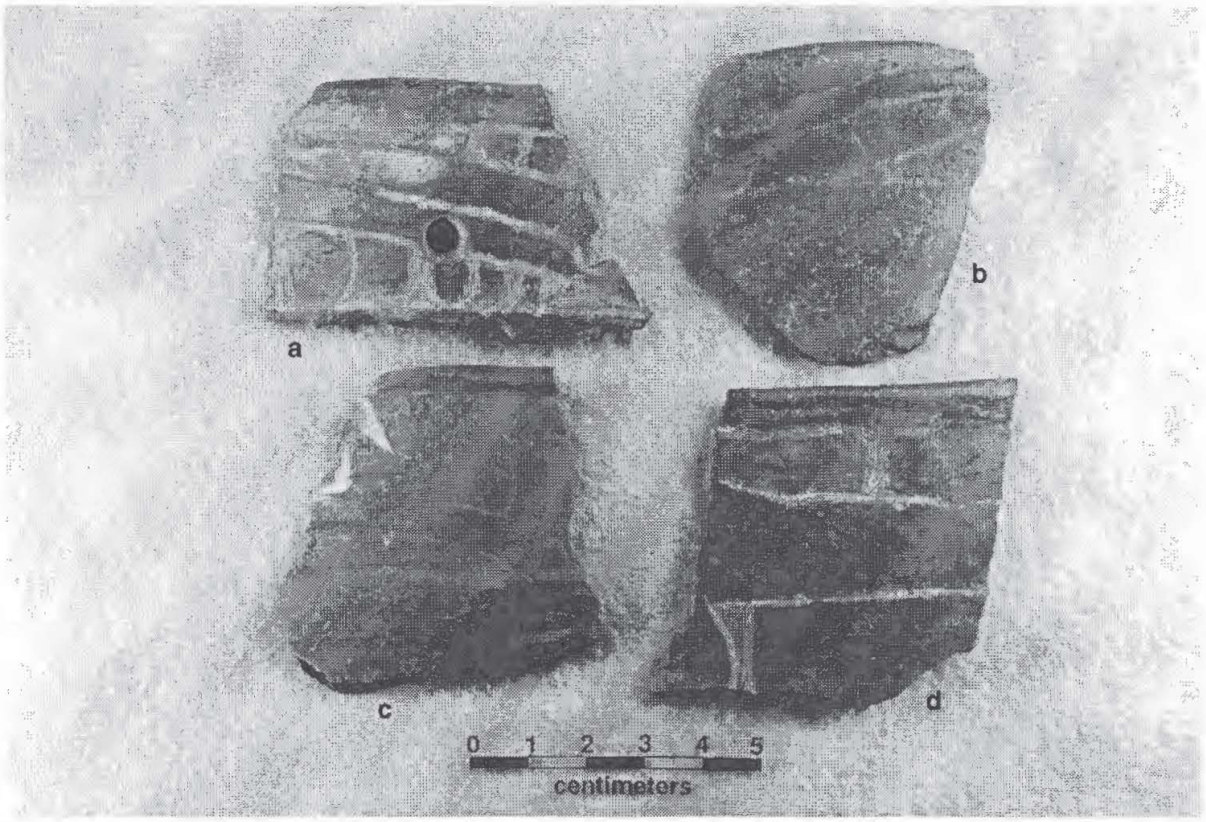


Figure 18. Ripley Engraved rim sherds from the Anglin site midden excavations.

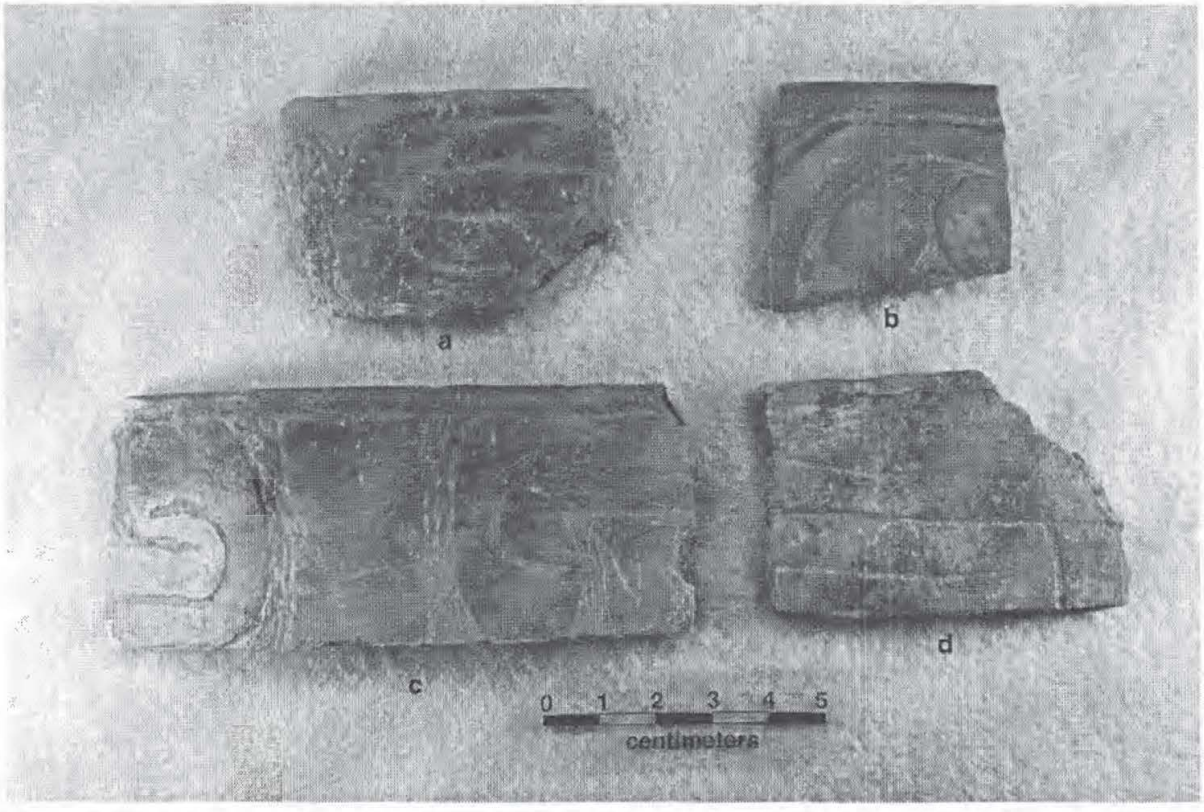


Figure 19. Rim sherds from Ripley Engraved vessels found in the Anglin site midden excavations.

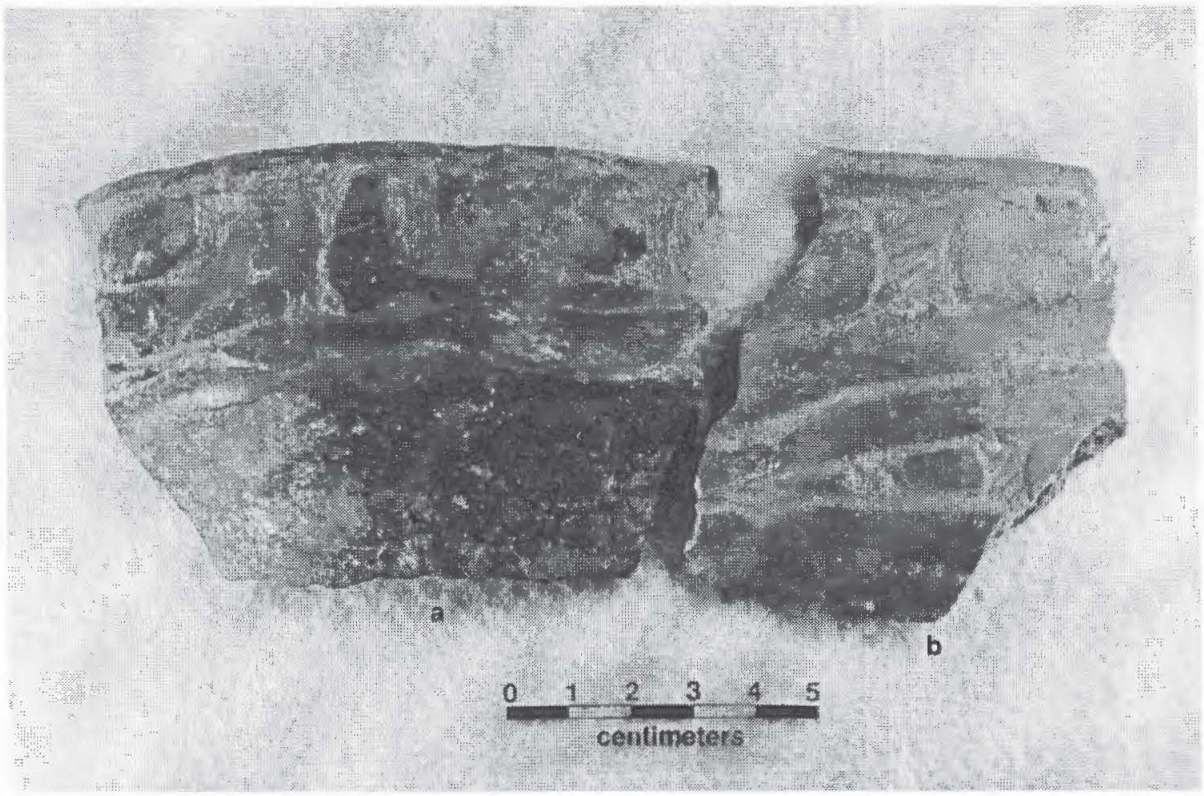


Figure 20. Ripley Engraved rim sherds from deeply engraved and excised vessels at the Anglin site.

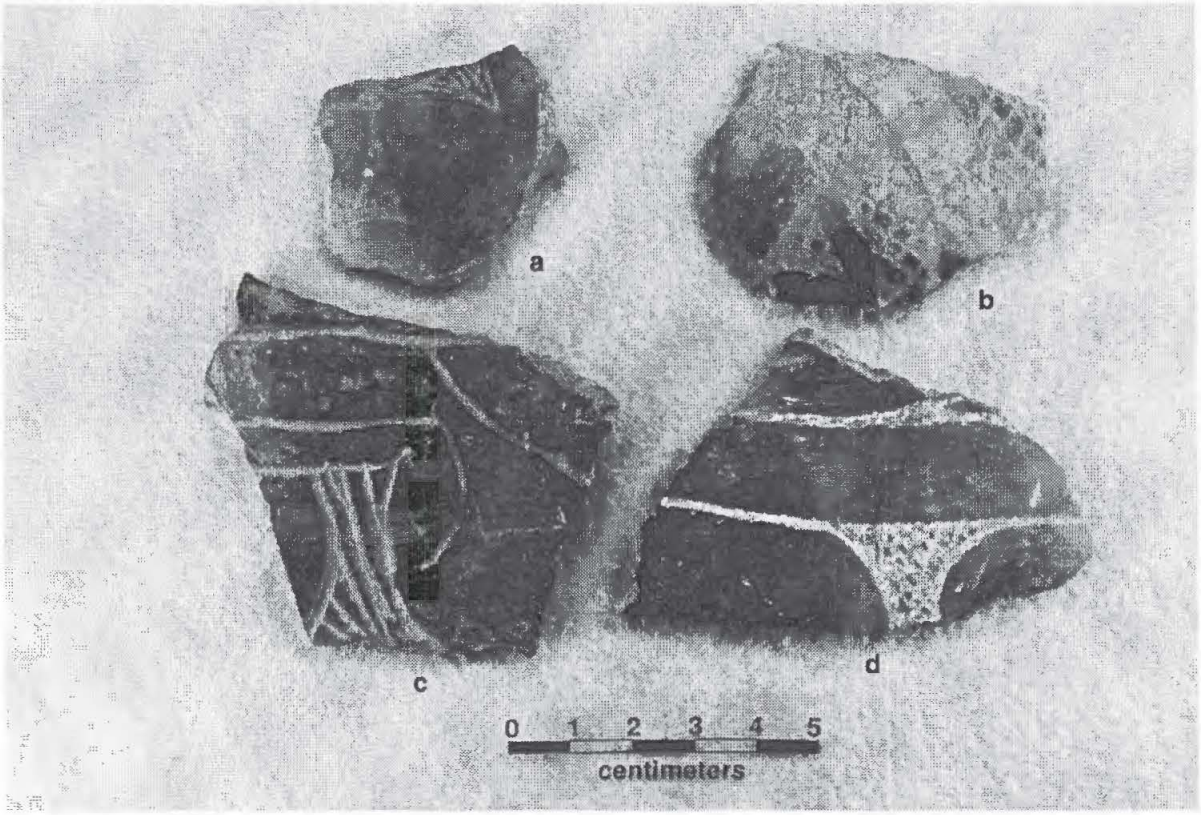


Figure 21. Selected engraved body sherds from the Anglin site excavations.

usually only in low amounts (1-7% of the whole vessels) in Titus phase sites in the Big Cypress Creek basin and in western Titus phase cemeteries in the upper Sabine River basin (Perttula et al. 1993). At the Pilgrim's Pride site, vessels with interlocking horizontal scroll motifs comprised 16% of the whole vessels (Perttula 2005, ed.:272). The predominance of the interlocking horizontal scroll motif at the Anglin site (see Figures 18d, 19a, c, and 21c), as well as in the Tuinier Farm sherds (30% of the Ripley Engraved sherds with an identifiable motif) and the Culpepper site vessels (31.6%, see Scurlock 1962:294 and Figure 6d), clearly set the Stouts Creek sites apart from all other well-documented Titus phase vessel assemblages.

At Anglin, 13% of the sherds with identifiable Ripley Engraved motifs have a continuous scroll (see Figure 20b); 21% of the Culpepper vessels have a continuous scroll rim motif (Scurlock 1962:Figure 6c). Other Titus phase cemeteries where vessels with the continuous scroll motif are relatively abundant includes sites in the upper or western reaches of the Big Cypress Creek basin, particularly at the Tuck Carpenter site (41CP5, 40%) and Mattie Gandy (41FK5, 29%) (Perttula 2005, ed.:272). This suggests some level of contact and interaction between the Caddo peoples living in the Stouts Creek and western parts of the Big Cypress Creek drainage during the time of the occupation at the Anglin site. Perttula's (1992:table A.2) analysis of Ripley Engraved motifs suggests this interaction may have taken place during the earlier part of the Titus phase occupation at the Stouts Creek sites, perhaps in the middle part of the 16th century.

The scroll motif is present in considerable numbers on vessels in Titus phase sites throughout the Big Cypress and upper Sabine river basins, as well as in sites in parts of the Sulphur River basin, from early to late Titus phase contexts (see Perttula et al. 1998; Perttula 2005, ed:272, 274; Thurmond 1990). At the Culpepper site, occupied during the latter part of the 17th century, vessels with the scroll motif account for 31.6% of the Ripley Engraved vessels (Scurlock 1962:Figure 6b). At Tuinier Farm and Anglin, sherds with the continuous scroll motif represent only 5-13% of the identifiable Ripley Engraved sherds (see Figure 18a-c).

A bit more than 9% of the Ripley Engraved sherds at the Anglin site with an identifiable motif have the nested triangle motif (see Thurmond 1990:Figure 6h). As with the interlocking horizontal scroll and continuous scroll motifs, Titus phase cemeteries with Ripley Engraved vessels having the nested triangle motif are more abundant in western Titus phase sites in the western reaches of the Big Cypress Creek basin (Perttula 2005, ed.:274-275; Perttula and Sherman 2008:Figure 9-27). This includes the A.P. Williams (41TT4, 15.1%), Pilgrim's Pride (41CP304, 10%), and Mockingbird (41TT550, 9.4%) sites

In addition to the many Ripley Engraved vessel sherds from carinated bowls, bowls, or compound bowls, a small percentage of the engraved fine wares are from other types, including Taylor Engraved (n=3), Hodges Engraved (n=4), Simms Engraved (n=13, all from hubcap-shaped carinated bowls), Avery Engraved (n=2), and a variant of Womack Engraved (n=6) (see Table 10 and Figure 21b). These are all post-A.D. 1500-1550 fine wares in the southern Caddo area, as was discussed above with respect to the fine wares from the Tuinier Farm site. The hubcap form of Simms Engraved (Figure 22a-d), including several that are lip notched, was made during the latter part of the McCurtain phase (ca. A.D. 1500-1700) (Perttula 1992:Table 11); none of the Simms Engraved sherds from Anglin are shell-tempered, and thus it is likely that they were not from Red River contexts, but from a more local production locale. The two Simms Engraved vessels (including one hubcap-style form) from the Culpepper site (Scurlock 1962:296, 298) are also not shell-tempered.

The possible Womack Engraved sherds from the Anglin site include two with inverted rims and four body sherds (see Table 10). These sherds have opposed and offset rows of either hatched or excised pendant triangles, with the upper row of triangles pointing downward and the lower row pointing upwards; the apexes of the triangles do not match. Except for the fact that the pendant triangles are hatched and excised, rather than cross-hatched, these sherds closely resemble Design A of Womack Engraved (Duffield and Jelks 1961:Figure 10; Story et al. 1967:Figure 49).

None of the cf. Womack Engraved sherds from the Anglin site are shell-tempered; only 3.3% of all the sherds from the site have shell temper (see below). At the nearby and contemporaneous Culpepper site, a recent examination of the vessels at the Texas Archeological Research Laboratory indicates that only 6.1% of the vessels are shell-tempered. Given the increased use of shell-tempering in Womack Engraved vessels in later 18th century contexts (Perttula 2007:137, 142), and an increased use of shell tempering in general in the manufacture of ceramic vessels, this

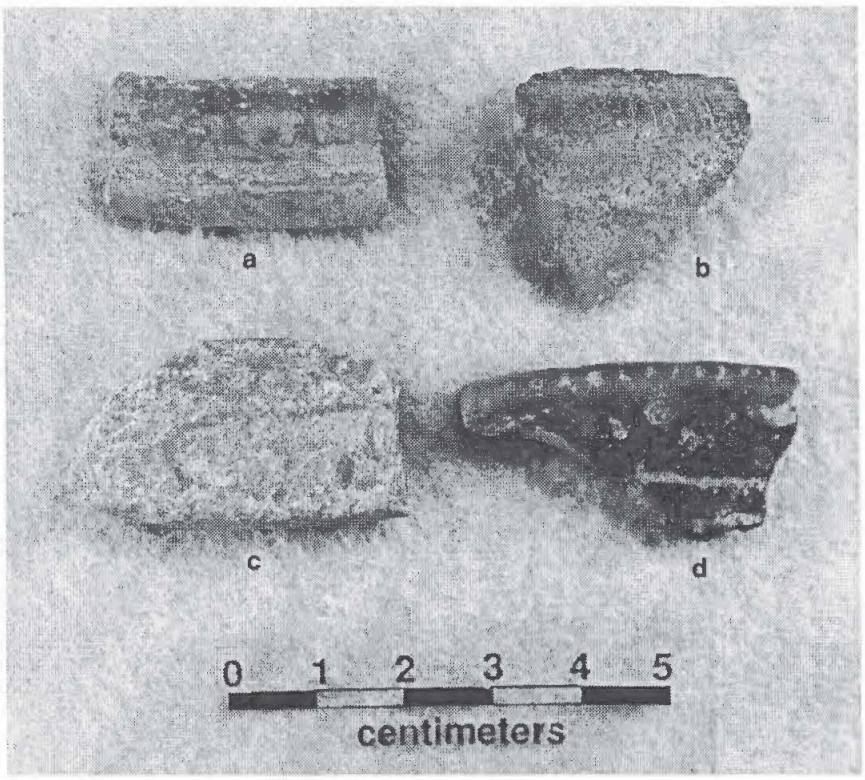


Figure 22. Simms Engraved sherds from the Anglin site. Provenience: a-b, d, midden excavations; c, 2003 surface collection.

suggests this design variant of Womack Engraved dates from the latter part (ca. A.D. 1670) of the 17th century, near the end of the Titus phase. About 8.5% of the Womack Engraved sherds from the early 18th century Womack site have shell temper. Later sites with Womack Engraved vessels and sherds have more shell-tempering in the sherd assemblages as a whole: 24% at the Pearson site on the upper Sabine (mid-late 18th century) and 56% at the Gilbert site, thought to date from ca. A.D. 1730-1770. At Gilbert, more than 70% of the Womack Engraved sherds have shell tempering (Story et al. 1967:Table 7).

There are 313 other engraved sherds at the Anglin site, mostly smaller pieces, that have simple straight, geometric, or curvilinear elements that cannot be associated with larger decorative elements or distinctive rim panel motifs (Table 11). I suspect that almost all of these sherds are from Ripley Engraved carinated bowls, based on a consideration of the more obvious decorative elements and motifs recognized in the larger body and rim sherds listed in Table 10. The shell-tempered and red-slipped sherds with single straight, parallel, or curvilinear engraved lines (see Table 11) are probably from Avery Engraved vessels.

Engraved bottle sherds (n=22) are not at all common at the Anglin site, accounting for only 3.7% of the engraved fine wares (see Figure 21a). At the Tuinier Farm site (see above), almost 10% of the engraved fine ware sherds are from bottles.

The most common decorative elements identified on the bottle sherds include curvilinear and concentric lines (n=6; two of these are from shell-tempered vessels) and curvilinear lines along one side of an excised area (n=4). One bottle neck has horizontal lines on it, and two others have simple straight or curvilinear opposed engraved lines, but the remainder include the following elements: curvilinear lines and zigzag lines (n=1); circles (n=1); excised scroll divider/filler (n=1); excised negative oval (n=1); curvilinear lines and excised triangles that are part of a scroll motif (n=1); scroll elements (n=1); cross inside a circle (n=1, see Figure 19b); and an oval with an attached excised triangle.

These engraved bottle elements, except for the excised negative oval and the two shell-tempered bottle sherds, would not be out of place on a Ripley Engraved bottle. The shell-tempered bottle sherds are likely from Avery Engraved vessels (and one of them is red-slipped), while the excised negative

Table 11. Other decorative elements in the Anglin site engraved fine wares (carinated bowls and bowls).

Decorative Element	Rim	Body	Pigment r/w*	RS	ST
single straight line	–	133	7/4	14	5
horizontal lines**	47	14	3/1	6	–
horizontal and vertical lines	–	1	–	–	–
parallel lines	–	70	4/3	9	5
diagonal lines	5	–	–	–	–
vertical lines	2	–	1/-	–	–
cross-hatched lines	–	1	–	1	–
cross-hatched and opposed lines	–	1	–	1	–
opposed lines***	1	–	–	–	–
cross-hatched zone	–	5	–	–	–
horizontal hatched ladder	1	–	–	–	–
panel	–	1	–	–	–
rectilinear lines	–	1	–	–	–
curvilinear lines	–	25	1/-	4	4
opposed curvilinear lines	1	4	1/-	1	–
Totals	57	256	17/8	36	14
%			5.4/2.6	11.5	4.4

*r/w=red/white pigment; RS=red-slipped; ST=shell-tempered; **one rim is lip notched; ***inverted rim vessel

oval element is from a Hodges Engraved vessel (see Suhm and Jelks 1962:Plates 37 and 38). Finally, there is a large Hodges Engraved bottle sherd from the Anglin site that has wide cross-hatched zones and triangular elements (see Figure 21b).

Two of the bottle sherds (9.1%) from the Anglin site have a red slip on their exterior surface, and one has a red pigment rubbed in the engraved motif.

Approximately 10.5% of the engraved sherds from the Anglin site also have a red-slipped surface (about 90% of these have both the interior and exterior surfaces covered with a red slip); red-slipped engraved vessel sherds are twice as common here when compared to the Tuinier Farm assemblage. This includes sherds from Ripley Engraved, Taylor Engraved, and shell-tempered Avery Engraved vessels; 14.3% of the red-slipped engraved sherds are shell-tempered. Fine ware sherds with pigments rubbed in the engraved designs are also more common at Anglin (10.4%, n=62) then at Tuinier Farm (6.1%). Most (67.7%; 90% at Tuinier Farm) of these sherds have a hematite-rich clay pigment (n=42), but 32.3% of the Anglin fine wares with a pigment have a white kaolin clay pigment compared to only 10% of the pigment-covered engraved sherds at the Tuinier Farm.

The red-slipped fine ware sherds (n=198), all body sherds from rim decorated fine wares, almost always (91.4%) have both surfaces covered with a slip. Another 7.6% have only an exterior red slip (and are probably from bottles) and 1% have only an interior red slip. Approximately 6.6% of the red-slipped sherds are from shell-tempered trade vessels, primarily Avery Engraved vessels.

Other fine wares from the Anglin site include one shell-tempered Keno Trailed body sherd (probably from a bowl) and two lip notched and burnished rim sherds. One of these also has a red slip on both sherd surfaces.

Fine ware rim forms are almost exclusively direct or vertical in profile (97.3%), with rounded (44.1%) and rounded, exterior folded (45.3%) lips.

There are four inverted rim engraved vessels in the Anglin site ceramic assemblage.

The utility ware sherds from the Anglin site are dominated by those with the following decorative classes: appliqued (n=219 or 40% of the utility wares), neck banded sherds (n=134, 24.5%), punctated (n=62, 11.3%), Anglin Impressed or corncob impressed (n=39, 7.1%), and brushed (n=32, 5.9%). On the basis of the proportion of utility ware rims, neck banded vessels are the principal utility ware (50.6% of the rims), followed by punctated vessels (22.5%), appliqued vessels (9%), Anglin Impressed vessels (9%), incised vessels (4.5%), and utility ware vessels with brushing (3.4%).

The Anglin site neck banded pottery from LaRue Neck Banded vessels includes 48 rims and 86 body sherds. These sherds have broad and crimped horizontal coils or neck bands encircling the rim that were not smoothed over (Figure 23a-b). Suhm and Jelks (1962:93) indicate that there may be as many as four to eight neck banded coils at the vessel rim.

One of the neck banded body sherds appears to also have corncob impressions, and four others have roughened rim and body areas (see Figure 23a). A single body sherd with pinching appears to represent a decorative element that simulates the use of neck banding, but without the crimping of coils.

Several of the neck banded sherds also have appliqued elements. This includes body sherds with neck banding above an appliqued ridge, appliqued lug handles and neck banding (Figure 24c), and appliqued nodes amidst neck banded coils (Figure 24a). Finally, a rim has a row of tool punctates under the lip and above the neck banded coils, and an appliqued node is set amidst the neck banding.

The appliqued sherds from the Anglin site are dominated by narrow and straight ridges of clay applied to vessel bodies (Table 12 and Figure 25a-c, e), single nodes, or sherds with an appliqued ridge and node. Most of these are from McKinney Plain vessels, where the appliqued ridge served to quadrate the vessel body (Suhm and Jelks 1962:Plate 49). Other appliqued elements that may mark McKinney Plain vessels are straight appliqued fillets (Figure 25d and Figure 26a, c).

Curvilinear appliqued ridges, parallel ridges, ridges with clusters of small nodes, parallel fillets, chevrons, and curvilinear lug handles on body and rim sherds are decorative elements (see Figure 26b, e; see also Figure 25f) associated with the more complicated Harleton Appliqued designs seen on Titus phase jars. These comprise about 22% of the appliqued sherds from the Anglin site. The node clusters and row of small nodes may also belong

Table 12. Decorative elements on the appliqued sherds from the Anglin site.

Decorative element	Rim	Body
single straight ridge	–	143
parallel ridges	–	24
curvilinear ridges	–	2
ridge and single node	–	1
ridges and clusters of small nodes	–	6
straight fillet	–	17
parallel fillets	–	1
chevrons	–	8
chevron and small nodes	–	1
small to large single nodes	3	7
node cluster	–	2
row of small nodes	–	1
curvilinear lug handles	2	3

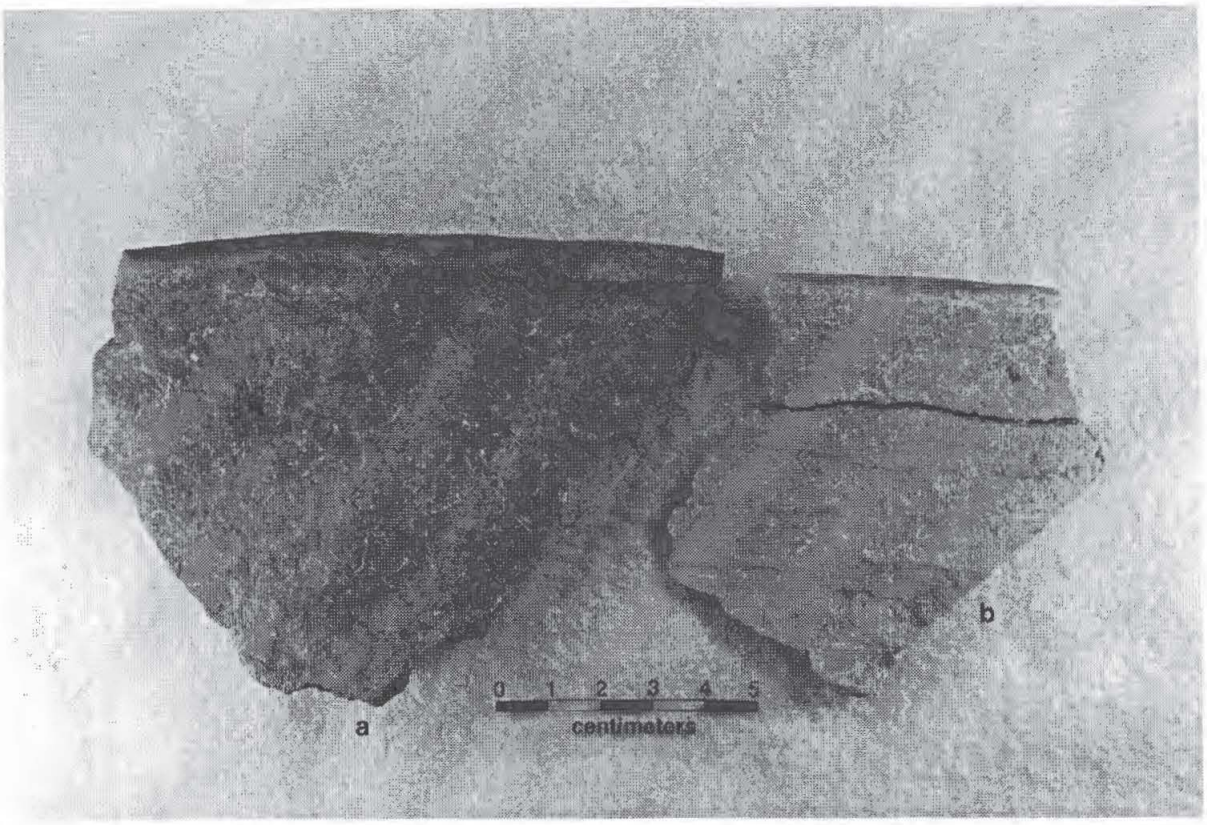


Figure 23. Neck banded rim sherds from the Anglin site midden excavations.

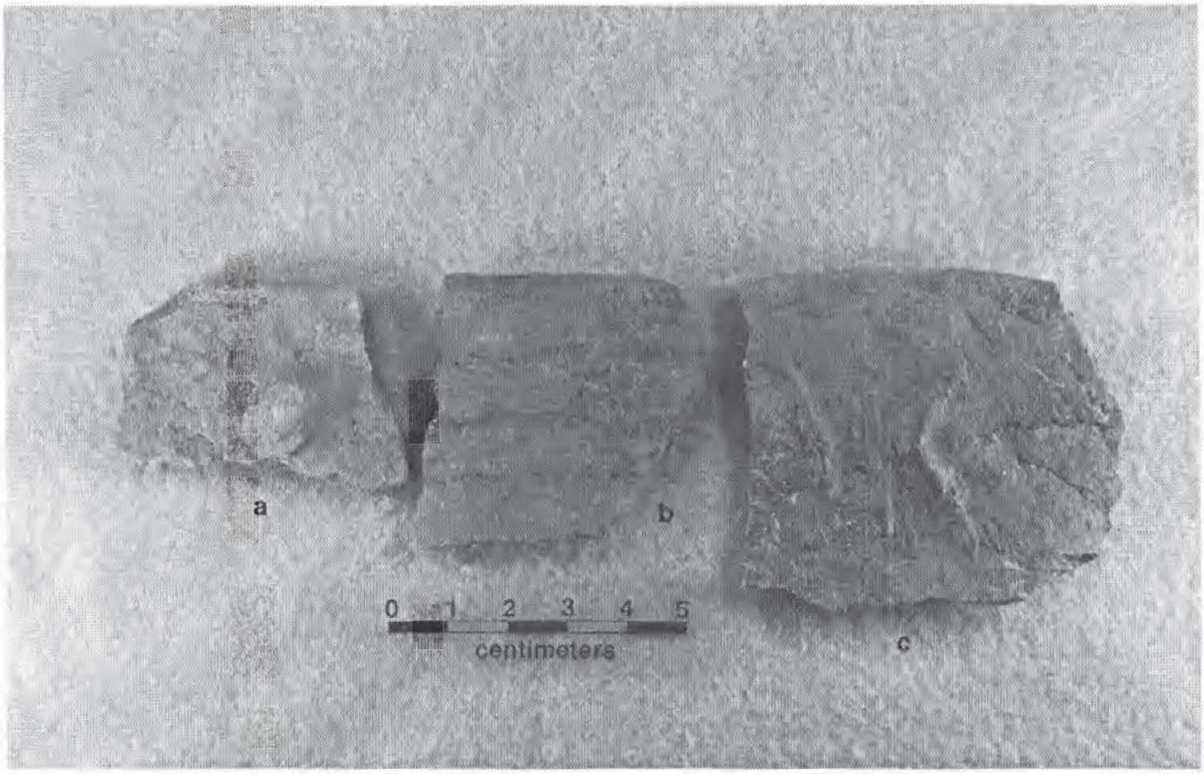


Figure 24. Sherds from vessels that are neck banded, neck banded-appliqued, and neck banded with appliqued lug handles from the midden excavations at the Anglin site.

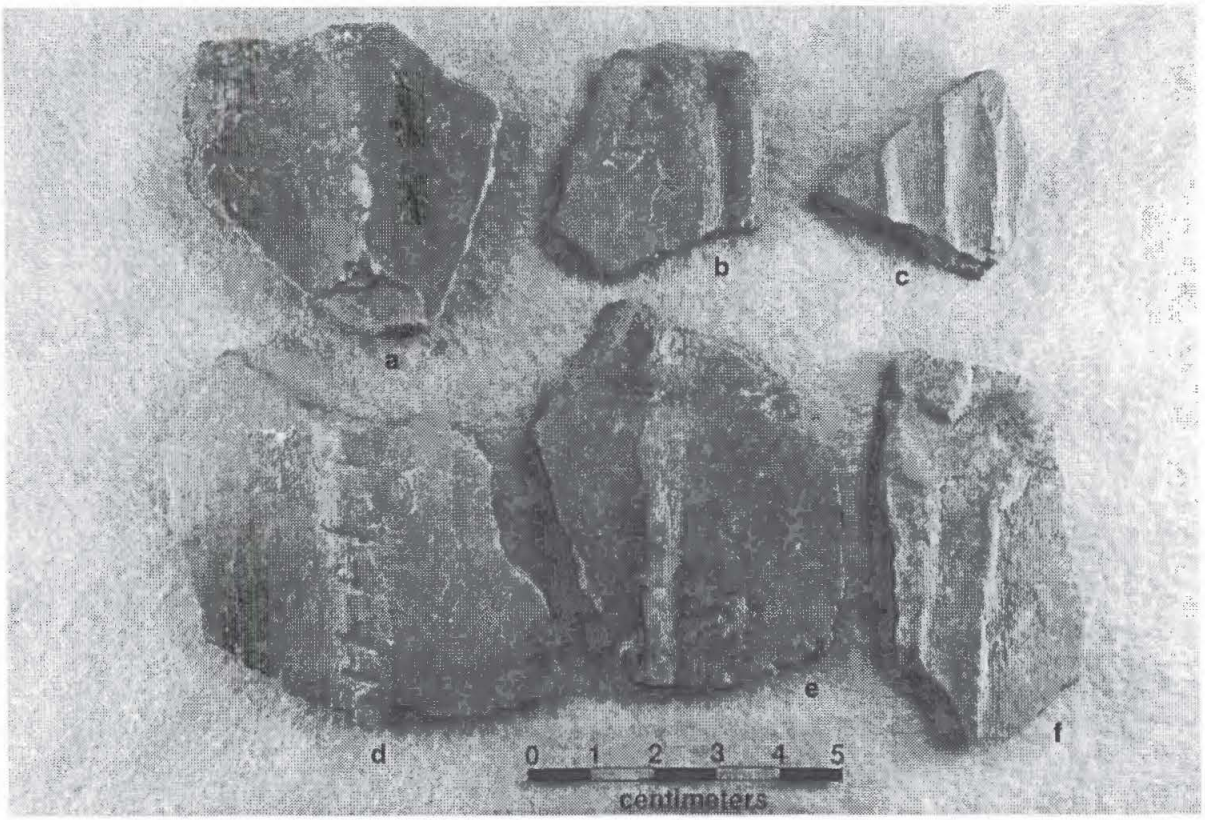


Figure 25. Appliqued sherds from the Anglin site midden excavations.

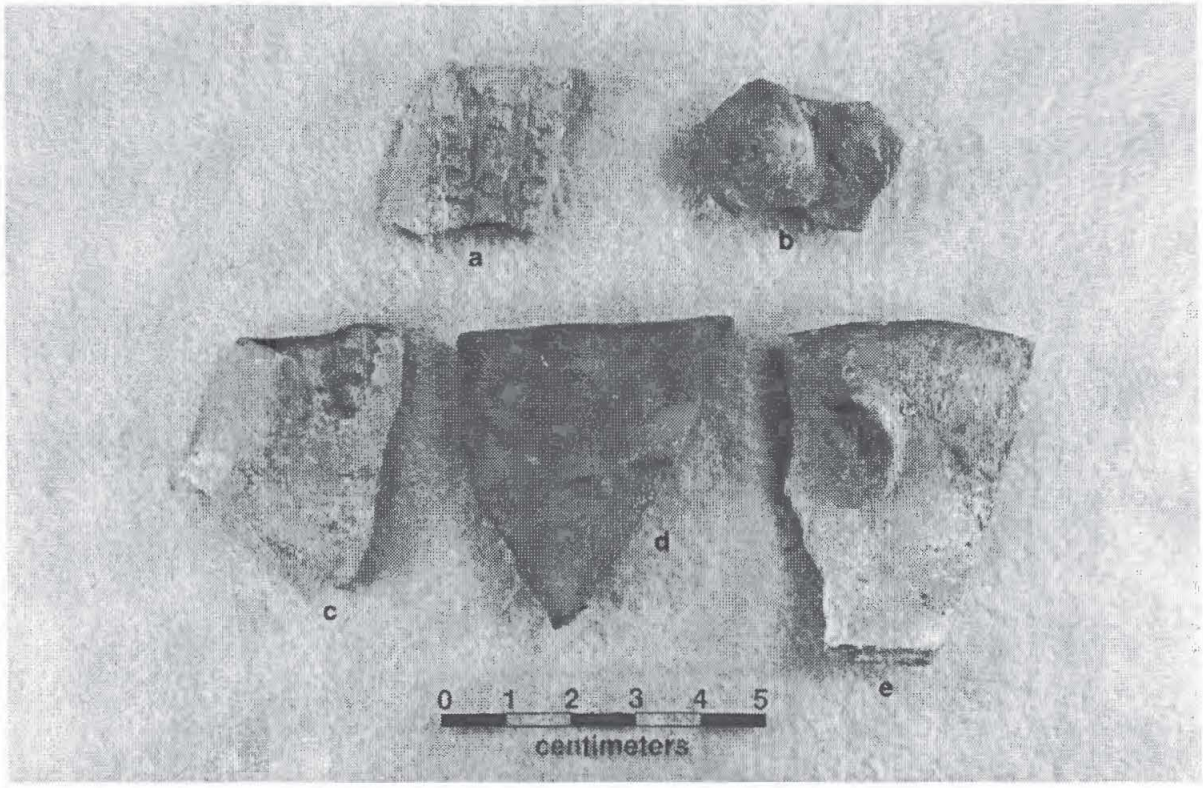


Figure 26. Appliqued and appliqued-punctated sherds from the Anglin site midden excavations.

with this group of pottery, rather than with the McKinney Plain vessel sherds.

There are seven appliqued-punctated sherds, including four rims (see Figure 26d and Figure 27e). The rims may be from Mockingbird Punctated vessels as they have at least one row of tool punctates on the rim, as well as a single appliqued node; in half the sherds, the appliqued node was placed above the punctated rows, just under the lip. The three body sherds include one with an appliqued ridge next to a row of punctations; another with a row of linear punctates alongside an appliqued node; and the third body sherd has an appliqued fillet alongside a row of fingernail punctates.

Three body sherds at the Anglin site have appliqued and brushed decorative elements. Two have a single straight appliqued ridge and an adjacent area with parallel brushing. The third sherd also has a single straight appliqued ridge, but with opposed brushing marks on either side of the ridge.

Sherds with tool punctations account for almost 60% of the punctated rim sherds from the Anglin site, as well as 77% of the body sherds (Table 13). Other punctated elements represented on sherds have been executed with either fingernails, a small circular tool (not a cane), or other forms of instrument punctations.

The tool punctates, with one exception, include at least one horizontal row of punctates encircling the vessel rim (Figure 27a-d). One rim has horizontal and vertical opposed rows of very small tool punctates. The other rims have similar horizontal rows of punctations. Six sherds with shallow and diagonal stab and drag punctates (Figure 27f-g) may be from the lower part of the rim of certain McKinney Plain vessels (see Suhm and Jelks 1962:Plate 49j).

There are 40 Anglin Impressed sherds in the Anglin site ceramic assemblage (Figure 28a-e), including nine rims. These sherds have horizontal rows of impressions made by rolling a corn cob over the wet paste surface of a utility ware jar. One of the Anglin Impressed rims also has an appliqued node under the vessel lip.

Vessels with brushing decorative elements (including those with brushed-incised and brushed-punctated elements) are not common at the Anglin site, comprising only 8% of the utility wares. By contrast, at the Tuinier Farm site, 20% of the utility wares have brushing, and 15.8% of the R. A. Watkins utility ware ceramics are brushed.

The Anglin site brushed sherds are both rim (n=4) and body sherds. Three of the rims have horizontal brushing marks, while the fourth is horizontally brushed, but with rows of tool punctations pushed through the brushing. The latter decorative element is known on Pease Brushed-Incised vessels (Suhm and Jelks 1962:119), which do occur in Titus phase sites in both mortuary and domestic contexts (Perttula 2005:Tables 11-10 and 11-11). Body sherds have parallel brushing (n=25), parallel brushed-incised (n=7), overlapping brushed (n=1), overlapping brushed-incised (n=1, similar to Spradley Brushed-Incised, a late 17th-early 18th century utility ware type seen in Caddo sites in the Neches-Angelina

Table 13. Decorative elements on the punctated sherds from the Anglin site.

Decorative element	Rim	Body
tool punctated row or rows	8	31
tool punctated row under vessel lip	1	–
opposed rows of small tool punctates	1	–
random tool punctates	–	1
single tool punctate	–	1
fingernail punctated row or rows	2	5
small circular punctated row	2	1
shallow stab and drag diagonal punctated row	3	3
crow's foot or opposed punctated row	–	1

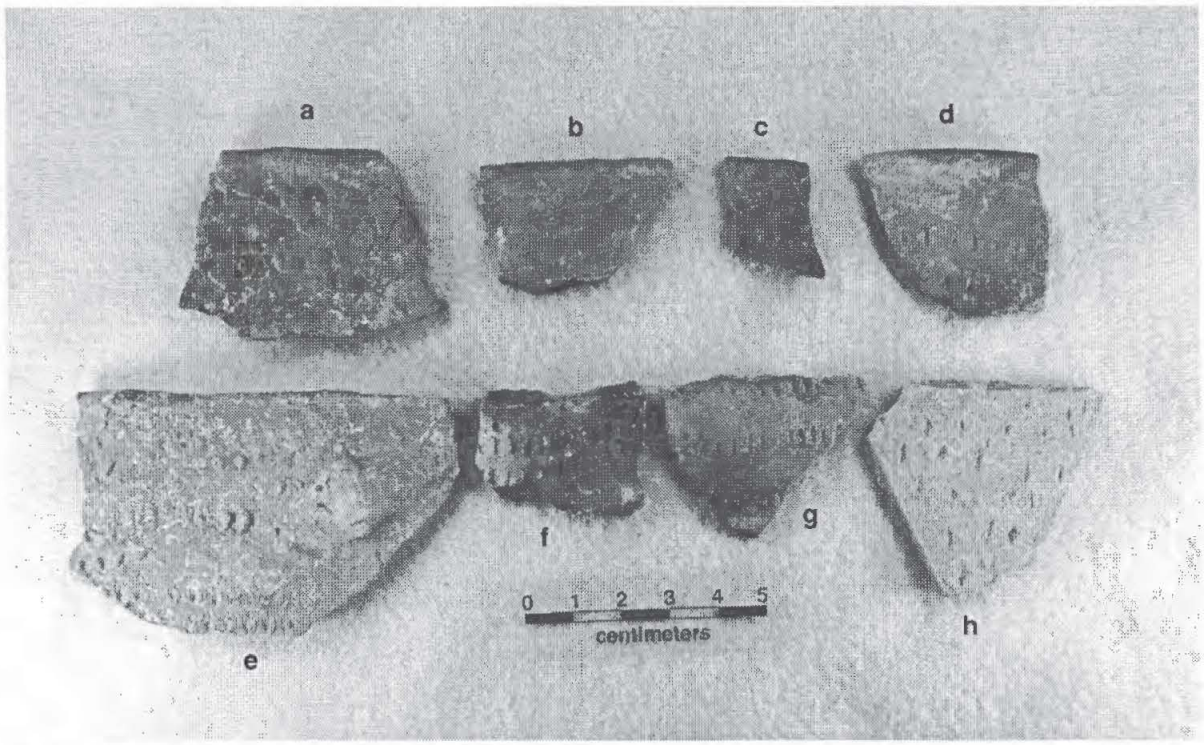


Figure 27. Punctated sherds from the midden excavations at the Anglin site, including one punctated-appliqued rim sherd.

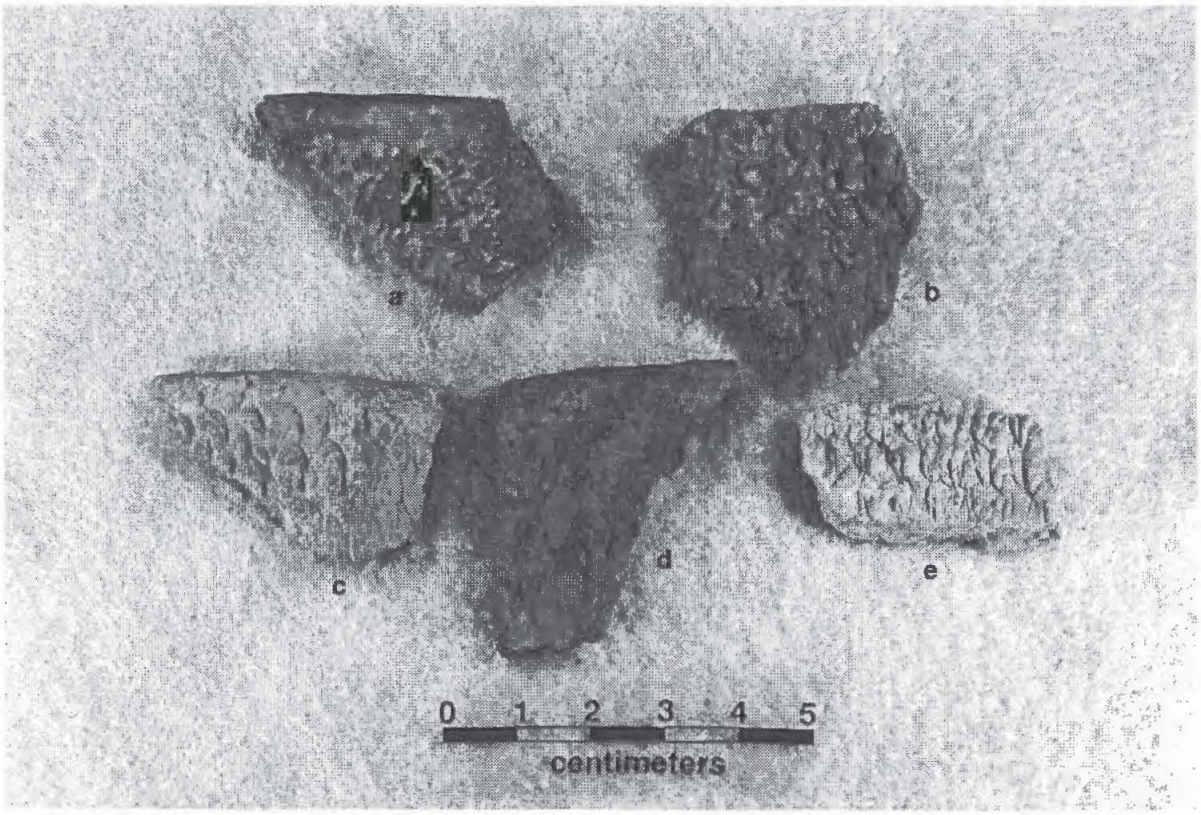


Figure 28. Anglin Impressed sherds from the midden excavations at the Anglin site.

river basins of East Texas, Shawn Marceaux, 2008 personal communication), vertical brushed (n=3), and one parallel brushed sherd with rows of tool punctates pushed through the brushing.

The few incised utility ware sherds from the Anglin site have simple straight line decorative elements (Table 14). This includes horizontal and diagonal incised lines on jar rims (Figure 29a) and opposed (Figure 29b) and parallel lines—closely- to widely-spaced—on vessel bodies (Figure 29d). One of the parallel incised body sherds is from a shell-tempered vessel made along the Red River, most likely Emory Punctated-Incised, a common shell-tempered utility ware in Late Caddo McCurtain phase contexts (see Perttula 2008:352 and Figures 25, 51, and 58c).

One body sherd (probably from the lower part of the rim) from Anglin has an incised-appliqued decorative element (see Figure 29c). This sherd has diagonal incised lines on one side of an appliqued lug, part of a lug handle.

Incised-punctated decorative elements are very rare in the sample of utility wares from the Anglin site (they are absent from the Tuinier Farm and R. A. Watkins ceramic collections), comprising less

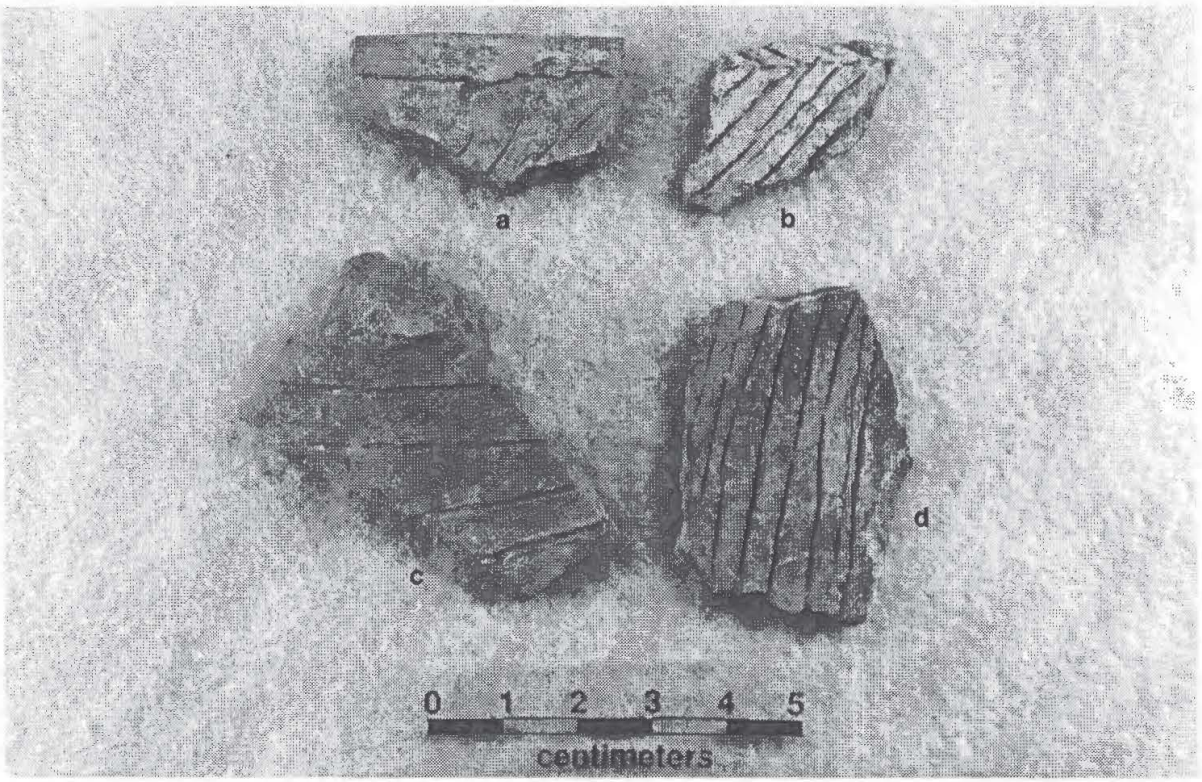


Figure 29. Incised and incised-appliqued sherds from the midden excavations at the Anglin site.

Table 14. Decorative elements on the incised sherds from the Anglin site.

Decorative element	Rim	Body
opposed incised lines	–	4
diagonal lines	3	–
horizontal lines	2	1
parallel lines	–	10
parallel lines, closely-spaced	–	1
parallel lines, widely-spaced	–	1
single straight line	–	5

than 0.2% of the utility wares and less than 0.1% of all the decorated sherds from the site (see Table 4 and see Figure 27h). The incised-punctated sherds, including one sherd, from the Anglin site have a tool punctated row framing a single broad incised line.

Incised-punctated sherds are not common in other Titus phase ceramic assemblages in the Sabine, Big Cypress, and Sulphur river basins, based on an analysis of the decorative composition of the domestic ceramics from 19 Titus phase sites (Perttula 2005:Table 11-11). In these group of 19 sites—each with substantial numbers of decorated sherds—incised-punctated sherds account for less than 3.6% of all the decorated sherds from each of the sites; at 11 of the sites, incised-punctated sherds comprise less than 1% of all the decorated sherds, and five of the sites had no incised-punctated sherds.

The utility ware rim sherds in the Titus phase ceramics at the Anglin site are dominated by everted rim profiles (59.4%) and direct/vertical profiles (39.1%). One rim has an inverted rim profile. Most of the utility ware rim sherds have a rounded lip (86.6%), with a few that have flat lips (6.1%). Not many utility ware vessel rims (6.1%) have had their lips folded to the exterior of the vessel as otherwise commonly noted on the fine ware vessels and a significant number of the plain ware vessels (see below). One utility ware rim has an interior beveled lip.

The plain ware sherds from the Anglin site include 94 rims, 3051 body sherds, and 114 base sherds; as previously mentioned, plain ware rims account for almost 26% of all the rim sherds from the site, indicative of a substantial plain vessel assemblage. Three sherds are from a roughly molded and poorly formed small plain vessel, possibly a vessel designed to hold pigments (Figure 30a-c').

The variety in rim and lip profiles of the plain rims suggest that plain jars, bowls, and carinated bowls were made and used at the site. Of the rims, 81.5% are from bowls and carinated bowls with direct or vertical profiles (Figure 31a-b, d), and 18.5% are everted rims from plain jars. Lip forms are very commonly rounded (58.3%), likely from bowls and jars, flat (9.4%, from jars, bowls, and carinated bowls), and rounded and exterior folded (28.1%); these latter rims (see Figure 31c, e) are likely from plain carinated bowls. Other lip forms present in the plain wares are rounded and exterior thickened (2.1%) and flat and exterior folded (2.1%): these are from bowls and plain carinated bowls.

The use of grog temper is pervasive among all three wares at the Anglin site (Table 15). The detailed analysis of a sample of 546 sherds from the site indicates that between 86.1% and 99% of all the sherds are from vessels made with grog temper inclusions. In most cases, grog was the sole temper inclusion. The highest proportions of grog temper occur in the plain wares and utility wares.

Other temper inclusions used by Caddo potters who lived along Stouts Creek include crushed and burned bone (with the highest proportions seen in the fine wares; bone-tempered pottery is more common in the fine wares at the Tuinier Farm site, see Table 6); hematite (most abundant in the Anglin site plain wares; at the Tuinier Farm site hematite-tempered pottery is most prevalent in the fine wares); and charred organic remains (most common in the fine wares) (see Table 15). A naturally sandy clay paste was used for some of the vessels manufactured in all three wares, particularly in the utility wares, but sandy paste grog-tempered pottery is slightly more common overall at the Tuinier Farm site, although the utility wares at that site also have the highest proportion of sandy paste sherds (see Table 6).

The most distinctive aspect of the Anglin sherds is the considerable number of shell-tempered sherds in the fine ware class (13%) (see Table 15); at the Tuinier Farm site, only 1.9% of the fine ware sherds were made with shell temper. Although no chemical analyses have been conducted on any of the sherds from the Stouts Creek sites to confirm the supposition, previous instrumental neutron activation analyses (INAA) of shell-tempered sherds from Northeast Texas Caddo sites, including Titus phase sites, indicate that shell-tempered vessels were made by Late Caddo McCurtain phase groups that lived on the middle reaches of the Red River, in the vicinity of the confluence of the Kiamichi and Red rivers (Cogswell et al. 2008). Outside of the Red River valley, shell-tempered vessels are quite rare. These INAA findings indicate that a number of engraved shell-tempered trade vessels—typically Avery Engraved, but also including utility wares—had been obtained in the course of contact and exchange by the Caddo peoples living at the Anglin site on Stouts Creek.

The sherds from the Anglin site are from vessels fired in approximately the same manner as the ceramic sherds from the Tuinier Farm assemblage (see Table 7). That is, technologically, the majority of the sherds in the Anglin ceramic assemblage are from vessels fired in a low oxygen or reducing environment—especially the fine wares—with the greatest proportion of those then pulled from the fire and allowed to cool in the open air (Table 16).

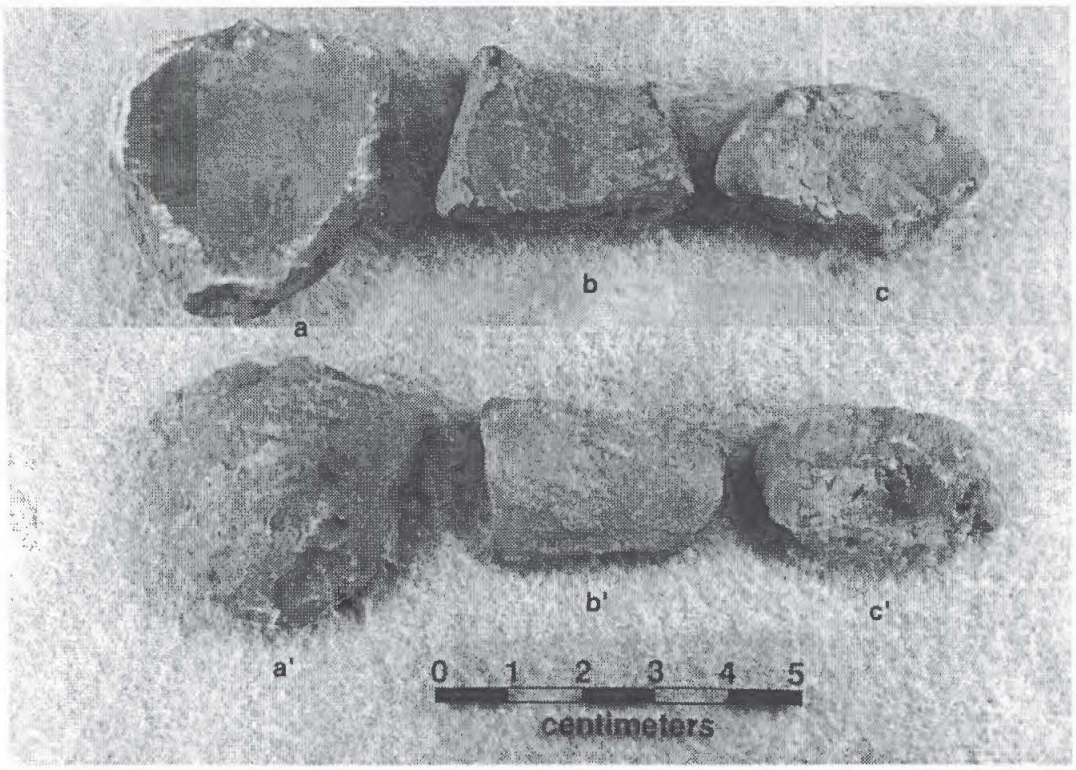


Figure 30. Rough molded plain vessel base and body sherds, possibly from a pigment vessel, at the Anglin site.

Table 15. Use of tempers in the Anglin site sherd collection.

Temper category	Plain wares	Utility wares	Fine wares
grog	80.3*	80.3	67.0
grog/sandy paste	8.9	9.4	7.0
grog-organics	1.3	0.9	4.3
grog-hematite	4.5	1.7	3.5
grog-hematite-sandy paste	0.6	–	–
grog-bone	3.2	4.3	4.3
grog-bone-sandy paste	–	0.8	–
grog-bone-hematite	0.3	–	–
bone	0.3	–	0.9
bone-hematite	0.3	–	–
shell	0.3	1.7	13.0
Summary comparisons			
grog	99.0	97.4	86.1
bone	4.1	5.1	5.2
hematite	5.7	1.7	3.5
organics	1.3	0.8	4.3
shell	0.3	1.7	13.0
sandy paste	9.6	11.1	7.0
Totals	314	117	115

*percentage

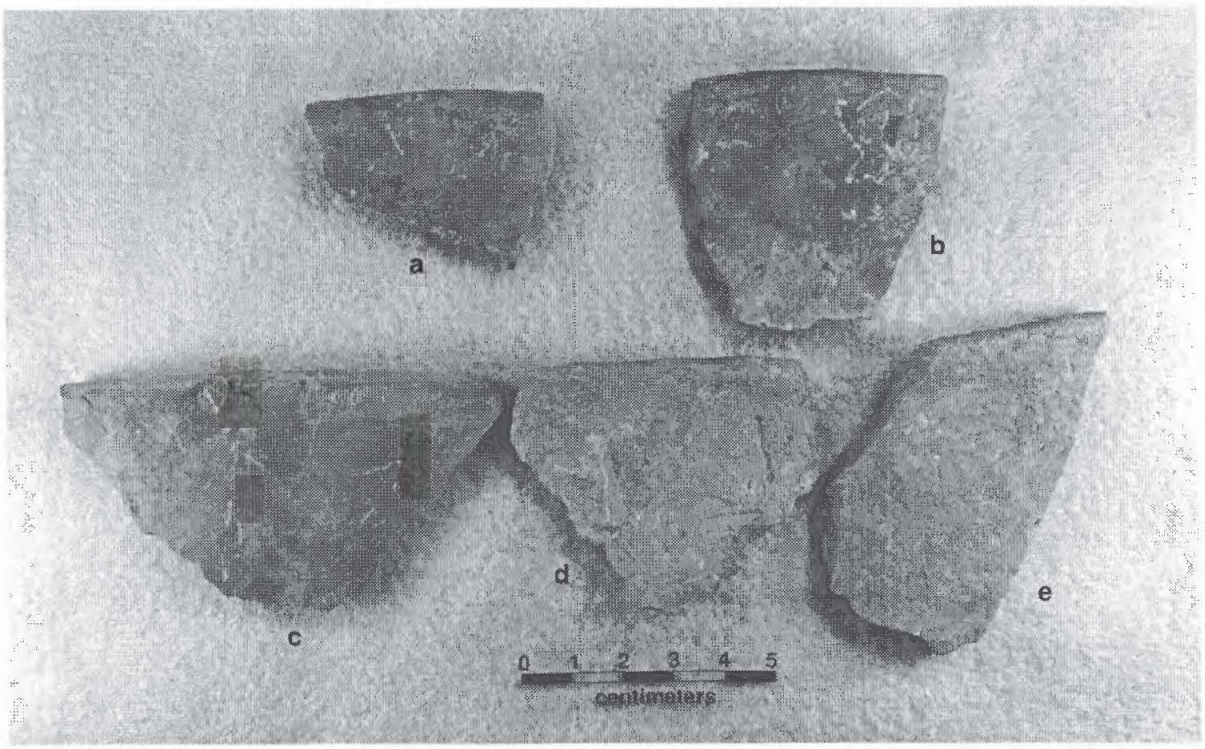


Figure 31. Plain rims from the midden excavations at the Anglin site.

Table 16. Firing conditions of the sherds in the Anglin site collections.

Firing category	Plain wares	Utility wares	Fine wares
Oxidized	21.7*	22.2	13.0
Incompletely oxidized	18.8	12.8	11.3
Sooted, smudged, reheated	2.9	0.8	1.7
Reduced	18.1	23.9	24.3
Reduced, but cooled in the open air	38.5	40.2	49.6
Totals	314	117	115

*percentage

At Anglin, between 56.6% (plain wares) and 73.9% (fine wares) of the sherds are from vessels fired in a reducing environment.

Sherds from oxidized and incompletely oxidized vessels, and from vessels that appear to have been sooted, smudged, or reheated, are most common in the plain wares (43.4%) and utility wares (35.8%) at the Anglin site (see Table 16). The fine ware vessels were apparently better fired, having been fired under well-controlled and lengthy firing conditions, limiting the number of vessels that were incompletely fired or reheated as well as producing vessels that would have been harder and more durable. The firing would also have led to the production of vessels that had the interior and exterior surface colors preferred by the Stouts Creek Caddo potters (i.e., chocolate brown, dark brown, and dark grayish-brown).

ELECTRON MICROPROBE ANALYSIS OF FIVE CADDO POTTERY SHERDS FROM THE TUINIER FARM SITE

Elsbeth Dowd, George Morgan, and Beau Schriever

The purpose of this analysis was to investigate the analytic potential of the electron microprobe (EMP) for examining pottery sherds from a Caddo archaeological site. Electron microprobe analysis is used to determine the qualitative and quantitative chemical composition of solid materials. There are several advantages of using the microprobe to study pottery sherds. First, the microprobe can be used to determine the chemical composition of very small locations, ranging from 0.2 to 20.0 um. This makes it possible to take separate readings of the clay and temper, analyzing both the clay size fraction of the paste and the composition of the temper. Second, the microprobe can analyze all elements with atomic numbers greater than or equal to 5, including silica. All of the major elements that make up most rocks and sediments can be identified, which could potentially be useful for differentiating and sourcing clays and tempers. Third, the microprobe has excellent digital imaging capabilities, accompanying the precise compositional readings.

This project was conducted at the University of Oklahoma Electron Microprobe Laboratory, with the assistance of Dr. George Morgan. The pottery sherds were provided by Dr. Timothy K. Perttula. They are from Tuinier Farm (41HP237), a 16th to 17th century Caddo site probably affiliated with the Titus phase. Analysis of these sherds demonstrates that the electron microprobe is useful for determining temper composition, and may be useful for differentiating the clays in each sherd.

METHODS

Samples were prepared for analysis as thick sections. A cross-section of each sherd, roughly 0.5 to 0.75 inches in length, was removed and embedded within a 1-inch PVC ring using a two-component epoxy. The rings were cleaned and one end taped closed to produce the form for holding the epoxy. The surface of the sherd sample to be analyzed was ground flat and this surface was placed face down in the ring and pressed down to adhere to the tape. Due to the friable nature of the ceramic samples, they were placed under a low vacuum to help the epoxy impregnate the ceramic body.

Once the epoxy has set, the samples were then hand polished flat using a sequence of progressively finer grit films and diamond slurries, with the final grit a 0.25 micron diamond slurry on a cloth pad. The polished thick sections were then sonically cleansed in water to remove all loose material. Following the cleaning, the thick sections were dried at low temperature in a lab oven. Finally, they were carbon coated to both ground the sample and make it electrically conductive, required conditions for microprobe analysis.

For each of the thick sections, microphotographs were taken for use as reference maps during analysis. This step was necessary because the microprobe is only capable of imaging a small portion of the sample at a time. The microphotographs provided a means to record the location of acquired backscattered electron (BSE) images and to identify temper. BSE imaging was used to select clay matrix and temper locations for identification using the Energy-Dispersive X-ray Analyzer (EDXA) and to capture windows on the sample documenting the analysis. The BSE image windows were acquired, saved as TIFF files, printed, and then used to mark and record the readings of clays and tempers.

Preliminary EDXA readings were taken of selected clay and temper locations on each sample to acquire a general understanding of the composition of each sherd. After this, 10 additional readings were taken of the clay portion of the matrix for each sherd. Minerals analyzed include SiO_2, TiO_2, Al_2O_3, FeO, MgO, CaO, Na_2O, and K_2O. This provided a larger sample for the chemical analysis of the clay portions, so that the composition of the clays could be more accurately compared.

RESULTS

Sherd #1 (a carinated bowl body sherd with engraved ovals, likely Ripley Engraved) has a multigenerational grog temper. Although there is not much quartz in the body matrix, the grog does contain quartz, along with smaller pieces of grog. Eight BSE images were taken in six separate areas of the sample (Figure 32a-c). Two EDXA readings were taken in Area 1, one of the matrix clay in the body and one of the matrix clay in the grog (Table 17).

Table 17. Initial EDXA Readings.

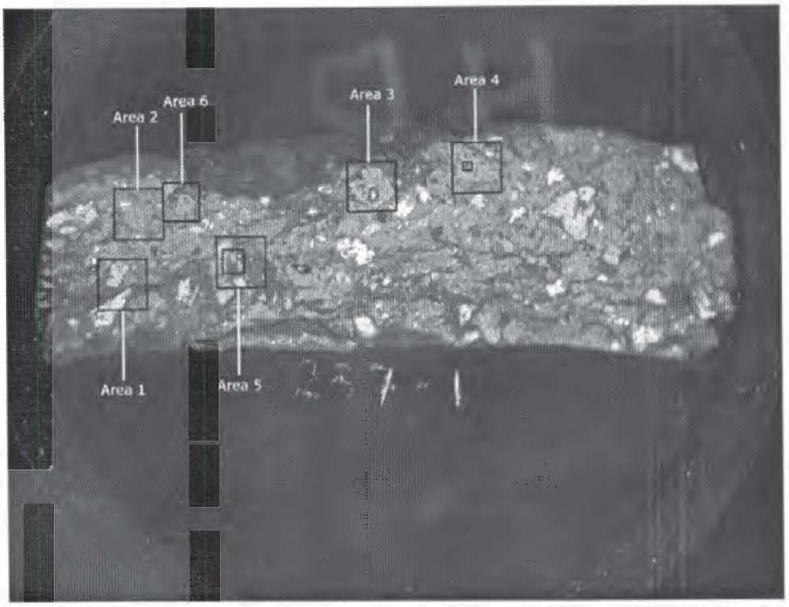
Sherd Number	Area	Spectrum
1	1	Matrix clay in body
1	1	Matrix clay in grog temper
2	1	Kfs-1 temper
2	1	Tourmaline temper
2	2	Gray matrix clay in body
2	2	White clay in grog temper (?)
3	1	Matrix clay in grog temper (?)
3	1	Matrix clay in body
4	2	Matrix clay in body
4	2	Matrix clay in grog temper
5	1	Shell temper
5	2	Matrix clay in body
5	4	Slip or burnished area
5	6	Bone temper

Sherd #2 (engraved carinated bowl body sherd with a hatched triangle pendant from a series of curvilinear lines) has quartz and feldspar temper. This includes three different feldspars, which are mostly end member K-spars (90-100 Orthoclase). Four BSE images were taken in four areas of the sample (Figure 33a-c). Two EDXA readings were taken in Area 1. The first was of Kfs-1 temper, which originally developed from high-temperature magma. The second was of Tourmaline (schorl) temper. This was probably originally part of a paraluminous granite, which is generally derived from the melting of pre-existing sediments. Two EDXA readings were taken in Area 2. The first was of the gray matrix clay in the body. The second was of white clay, which may be part of a grog temper, or which may be part of a non-homogeneous section of the body paste.

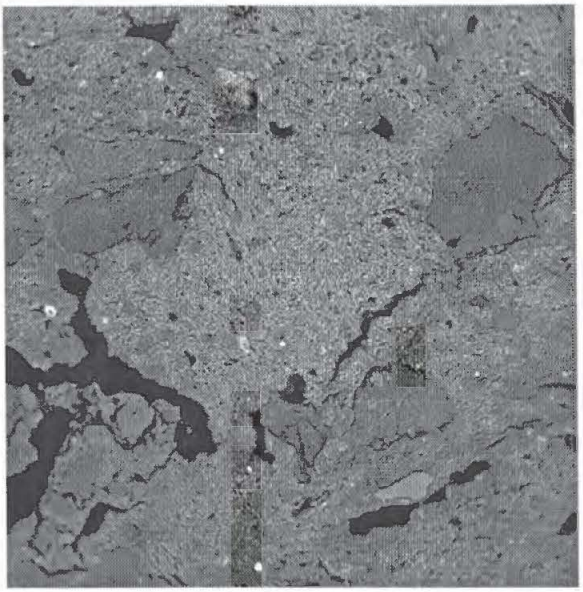
Sherd #3 (engraved carinated bowl body sherd with a panel filled with short vertical lines; a red pigment had been rubbed into the engraved lines, probably Ripley Engraved) has a temper of either grog or of crushed fired clay, much like Sherd #2. As in Sherd #2, there are a number of end member K-spars, but no noted Tourmalines. Both sherds #2 and #3 also contain high quantities of quartz. Although they look very similar in mineral content, however, Sherd #3 has a lower silica content and a higher iron oxide content than Sherd #2. Six BSE images were taken in six areas of the sample (Figure 34a-c). Two EDXA readings were taken in Area 1. The first was of matrix clay in the potential grog temper, and the second was of matrix clay in the body.

Sherd #4 (a Ripley Engraved carinated or compound bowl sherd with a scroll element) has a dark grog temper with denser, finer-grained clay particles than those in the body matrix. We are uncertain why the grog is so dark, but it could be due to carbon or organic matter. Four BSE images were taken in four areas of the sample (Figure 35a-c). Two EDXA readings were taken in Area 2. The first was of matrix clay in the body, and the second was of matrix clay in the grog temper. Sherd #4 also contains a large amount of quartz, made up of smaller, denser particles than in Sherds #2 or #3.

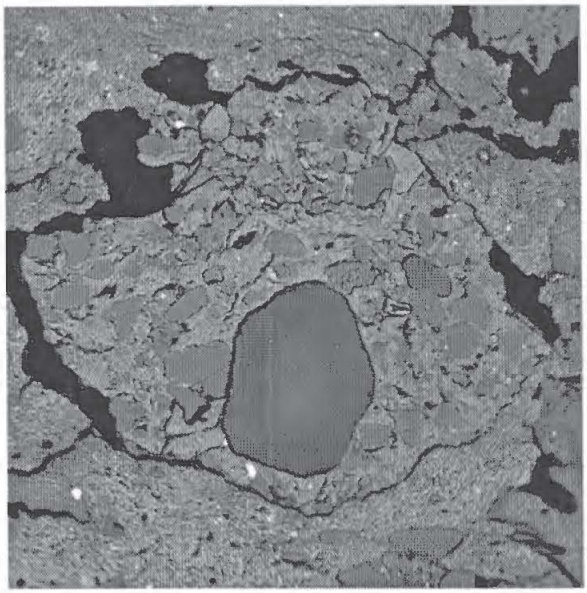
Sherd #5 (probable Avery Engraved body sherd from a Red River trade vessel with a hatched ladder element; macroscopic examination by Perttula suggested it did have an exterior red slip) has a shell temper in a range of sizes, from relatively large pieces down to clay-size particles. There are also some bone, hematite, quartz, and Bryazoan inclusions. Six BSE images were taken in six areas of the sample (Figure 36a-c). Four EDXA readings were taken. The first was in Area 1, of the shell temper. The second reading was in Area 2, of the clay matrix. This spectrum showed a high level of calcium, but this was probably from minute particles of ground shell. The third reading was in Area 4, on the edge of the sherd. At first we thought that there may have been a slip applied to the vessel, but the composition



a



b



c

Figure 32. EMP sherd 237-1: a, areas 1-6; b, Area 2 at 50x; c, Area 3 at 50 x.

looks the same as that of the clay matrix in Area 2, so we think that the edge was simply burnished. The fourth reading was from Area 6, of a piece of bone, identifiable by the spike in phosphorus.

Following the initial EDXA readings, 10 additional reading were taken from the clay matrix in each sherd. The samples can best be compared by looking at the normalized weight percent oxides of the different minerals (the center columns in Table 18). The clay matrices on two of the sherds (#2 and #5) are different from the other three. The silica content is higher in Sherd #2 than in any other sherd, making it distinctive. The calcium content is high in Sherd #5, but this could be due to the large quantity of crushed shell in the matrix, rather than to any properties of the clay. The other three sherds all look relatively similar, up to the 1-sigma level. Sherd #1 may be somewhat distinct based on iron content, but this may not be effectively distinguishable at the 2-sigma level.

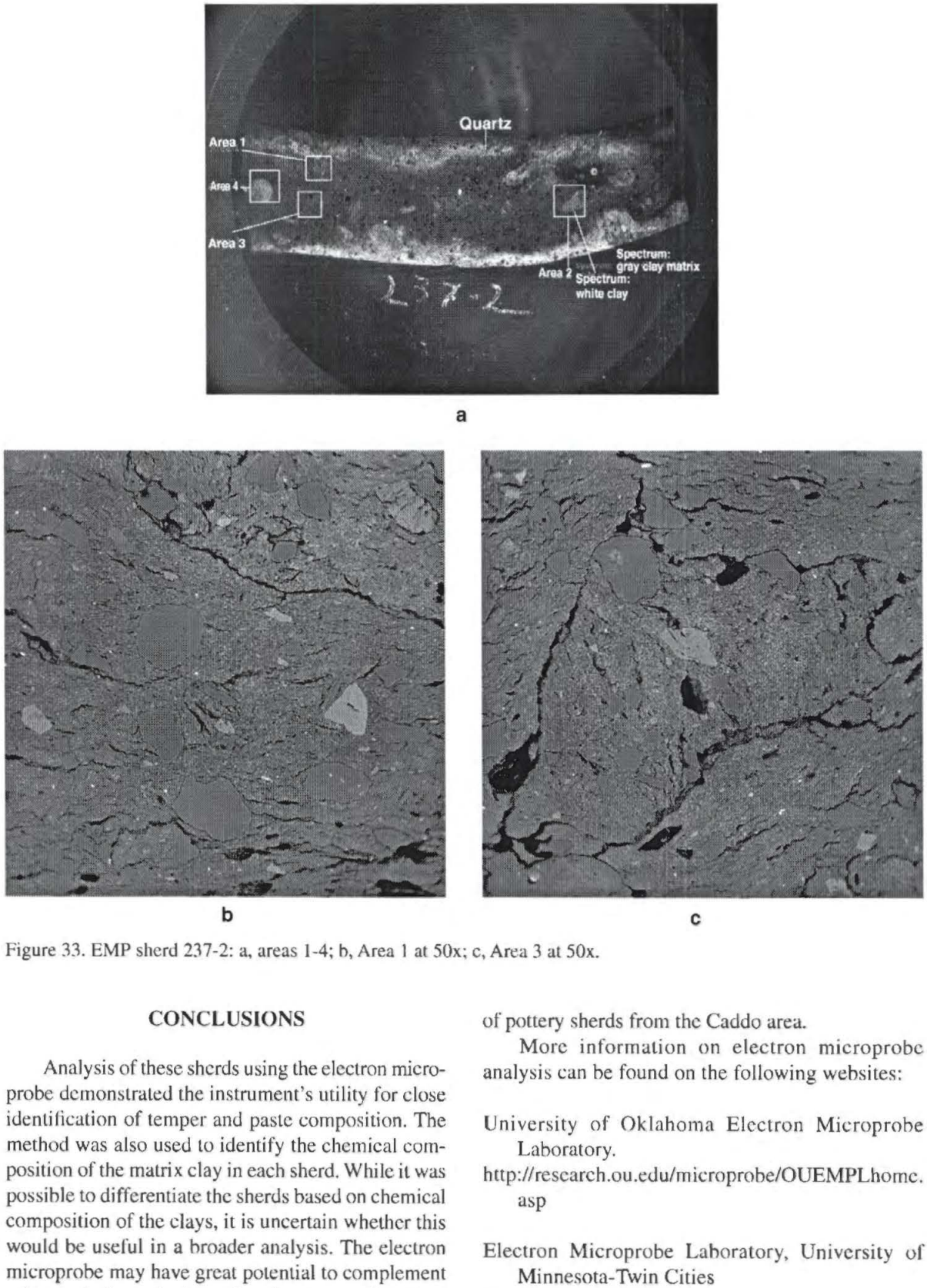


Figure 33. EMP sherd 237-2: a, areas 1-4; b, Area 1 at 50x; c, Area 3 at 50x.

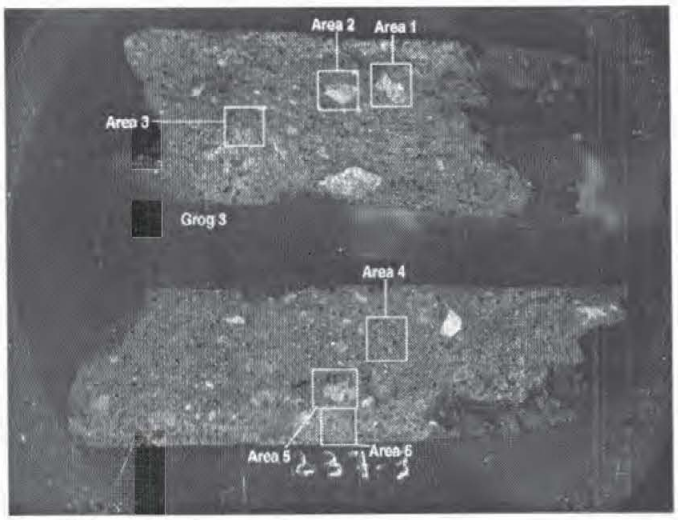
CONCLUSIONS

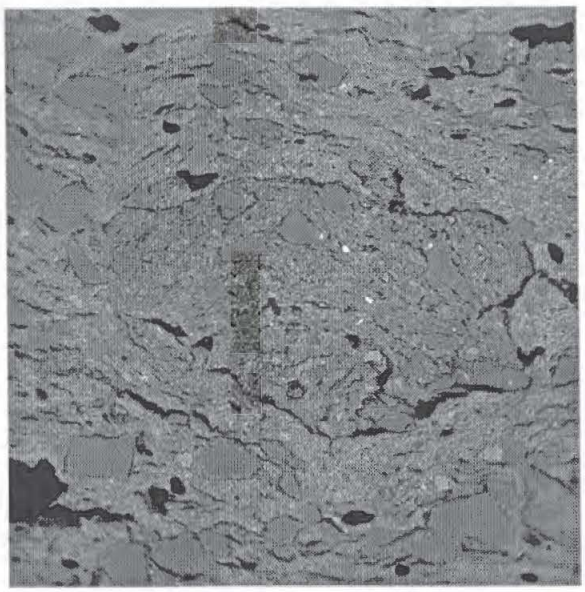
Analysis of these sherds using the electron microprobe demonstrated the instrument's utility for close identification of temper and paste composition. The method was also used to identify the chemical composition of the matrix clay in each sherd. While it was possible to differentiate the sherds based on chemical composition of the clays, it is uncertain whether this would be useful in a broader analysis. The electron microprobe may have great potential to complement other analytic methods, such as instrumental neutron activation analysis and laser oblation, in the analysis of pottery sherds from the Caddo area.

More information on electron microprobe analysis can be found on the following websites:

University of Oklahoma Electron Microprobe Laboratory.
http://research.ou.edu/microprobe/OUEMPLhome.asp

Electron Microprobe Laboratory, University of Minnesota-Twin Cities
http://probelab.geo.umn.edu/




b

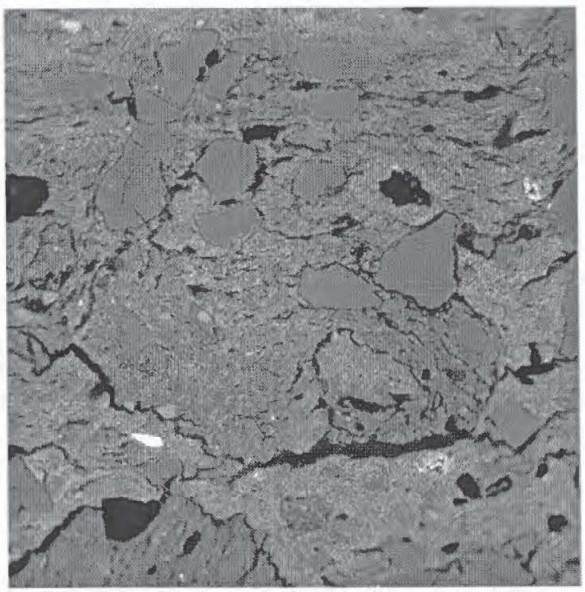
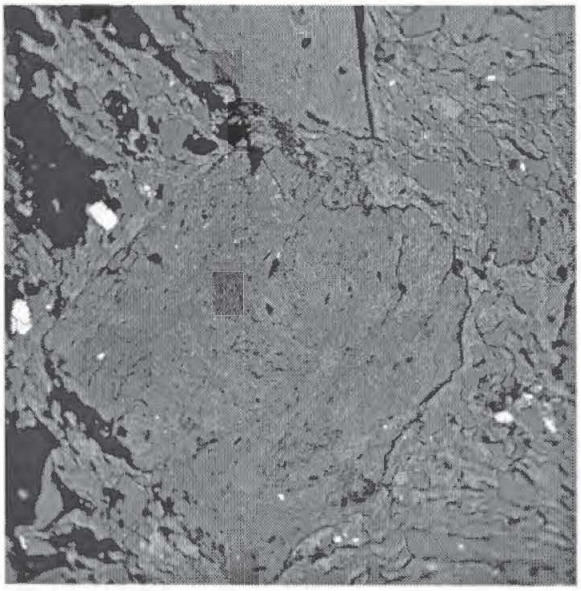
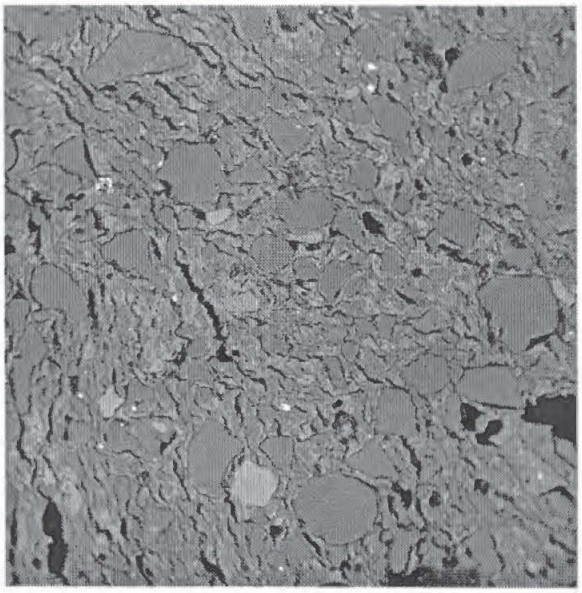

c

Figure 34. EMP sherd 237-3: a, areas 1-6; b, Area 2 at 50x; c, Area 5 at 50x.

a

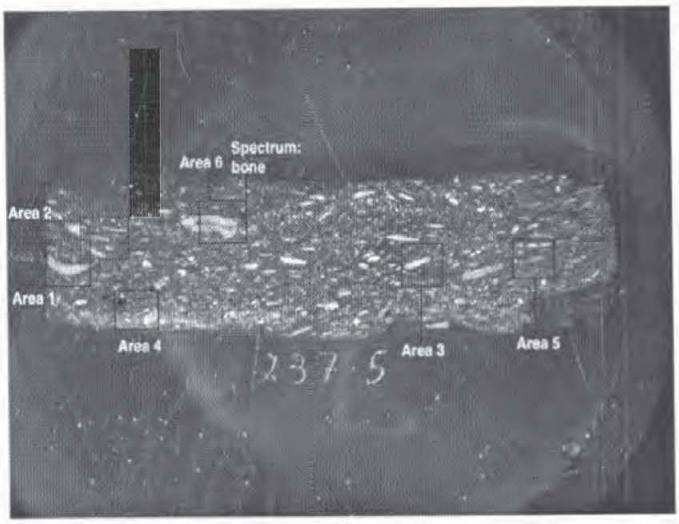


b

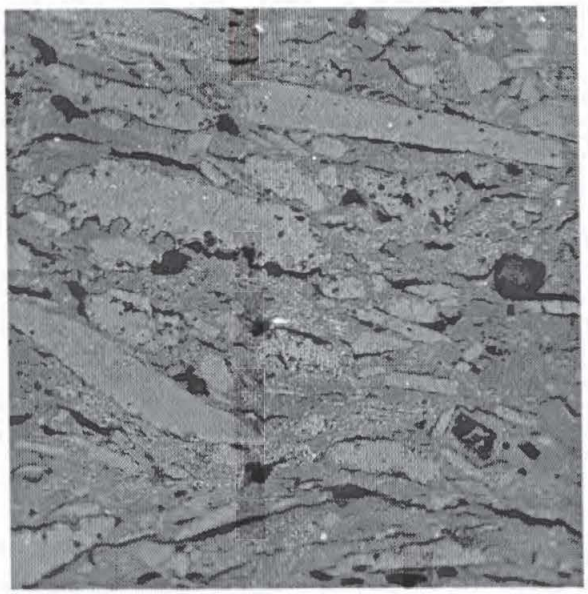


c

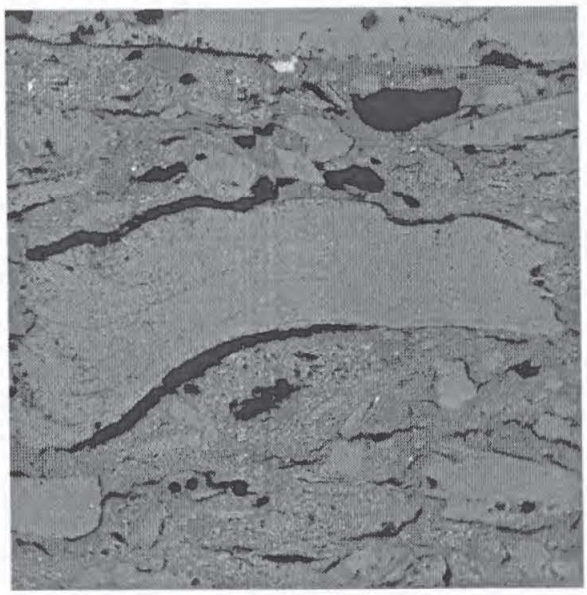
Figure 35. EMP sherd 237-4: a, areas 1-4; b, Area 3 at 50x; c, Area 4 at 50x.



a



b



c

Figure 36. EMP sherd 237-5: a, areas 1-6; b, Area 2 at 50x; c, Area 5 at 79x.

Table 18. EMPA of "clay" matrices, samples 237-(1-5), by standardized EDXA.

EMPA of "clay" matrices, samples 237-(1-5), by standardized EDXA: 12 February, 2008

ANA file: ClayEDX1.ANA

	Raw Weight Percent Oxides									Normalized Weight Percent Oxides									Cations per 22 Oxygen								
Label	SiO_2	TiO_2	Al_2O_3	FeO	MgO	CaO	Na_2O	K_2O	Total	SiO_2	TiO_2	Al_2O_3	FeO	MgO	CaO	Na_2O	K_2O	Total	Si	Ti	Al	Fe	Mg	Ca	Na	K	Sum
237-1																											
#1-1	56.86	0.60	19.48	5.80	2.02	0.73	0.62	2.14	88.07	64.57	0.68	22.12	6.36	2.30	0.83	0.71	2.43	100.00	7.842	0.062	3.166	0.646	0.416	0.109	0.166	0.377	12.784
#1-2	54.31	0.97	18.79	5.82	1.84	0.79	0.49	2.12	85.12	63.80	1.14	22.07	6.83	2.16	0.93	0.57	2.49	100.00	7.780	0.105	3.172	0.697	0.393	0.121	0.135	0.387	12.790
#1-3	55.90	0.56	18.60	6.18	1.85	0.70	0.63	2.10	86.54	64.60	0.66	21.49	7.14	2.14	0.81	0.73	2.43	100.00	7.875	0.061	3.067	0.728	0.389	0.105	0.173	0.377	12.796
#1-4	55.82	0.83	18.48	6.61	1.70	0.62	0.31	2.22	86.79	64.32	0.96	21.29	7.61	1.96	0.95	0.35	2.56	100.00	7.862	0.088	3.067	0.778	0.357	0.124	0.084	0.399	12.758
#1-5	55.07	0.76	18.99	6.38	1.73	0.81	0.58	2.15	86.47	63.69	0.88	21.98	7.38	2.00	0.93	0.67	2.49	100.00	7.788	0.081	3.165	0.754	0.365	0.122	0.159	0.388	12.822
#1-6	57.03	0.96	17.21	5.75	1.63	0.82	0.35	2.18	85.93	66.36	1.12	20.03	6.69	1.90	0.96	0.41	2.53	100.00	8.054	0.102	2.864	0.679	0.343	0.125	0.097	0.392	12.656
#1-7	57.21	0.76	19.40	6.05	1.93	0.75	0.55	2.33	88.98	64.29	0.86	21.80	6.80	2.17	0.84	0.62	2.62	100.00	7.836	0.079	3.131	0.693	0.394	0.110	0.146	0.408	12.797
#1-8	56.67	0.70	18.70	6.56	1.76	0.71	0.40	2.16	87.65	64.65	0.80	21.34	7.48	2.00	0.81	0.45	2.47	100.00	7.887	0.073	3.068	0.764	0.364	0.106	0.107	0.384	12.752
#1-9	54.85	1.03	18.03	6.55	1.79	0.71	0.49	2.13	85.58	64.09	1.21	21.07	7.65	2.09	0.83	0.57	2.49	100.00	7.842	0.111	3.038	0.783	0.382	0.109	0.136	0.389	12.790
#1-10	52.88	0.64	19.10	6.69	1.76	1.06	0.45	2.00	84.58	62.52	0.78	22.58	7.91	2.09	1.25	0.53	2.36	100.00	7.676	0.070	3.268	0.812	0.382	0.164	0.126	0.370	12.868
Average	**55.66**	**0.78**	**18.68**	**6.22**	**1.80**	**0.79**	**0.49**	**2.15**	**86.57**	**64.29**	**0.91**	**21.57**	**7.19**	**2.08**	**0.91**	**0.56**	**2.49**	**100.00**	**7.844**	**0.083**	**3.103**	**0.733**	**0.378**	**0.120**	**0.133**	**0.387**	**12.781**
Std Dev	1.39	0.16	0.67	0.40	0.11	0.10	0.11	0.09	1.36	0.96	0.19	0.71	0.50	0.12	0.13	0.13	0.07	0.00	0.096	0.018	0.108	0.053	0.021	0.017	0.030	0.011	0.055
237-2																											
#2-1	66.70	0.71	14.49	2.63	0.66	0.68	0.64	1.34	88.04	75.76	0.80	16.45	2.98	0.75	1.00	0.72	1.53	100.00	8.857	0.071	2.267	0.292	0.131	0.125	0.164	0.228	12.135
#2-2	63.31	0.51	14.91	2.93	0.73	0.93	0.53	1.59	85.45	74.09	0.60	17.45	3.43	0.86	1.09	0.62	1.86	100.00	8.715	0.053	2.419	0.338	0.150	0.137	0.142	0.279	12.233
#2-3	64.18	0.70	14.79	2.81	0.69	0.77	0.73	1.57	86.24	74.42	0.81	17.15	3.26	0.80	0.89	0.84	1.83	100.00	8.745	0.071	2.375	0.320	0.141	0.112	0.192	0.274	12.229
#2-4	64.41	0.71	14.45	3.07	0.59	0.83	0.47	1.40	85.93	74.95	0.83	16.81	3.57	0.69	0.96	0.55	1.63	100.00	8.795	0.073	2.325	0.351	0.121	0.121	0.124	0.245	12.154
#2-5	64.67	0.46	15.51	3.21	0.85	0.90	0.48	1.49	87.57	73.85	0.53	17.71	3.67	0.97	1.03	0.55	1.71	100.00	8.687	0.047	2.455	0.361	0.171	0.129	0.125	0.258	12.230
#2-6	65.51	0.54	15.14	3.02	0.78	0.87	0.33	1.43	87.62	74.77	0.62	17.28	3.44	0.89	0.99	0.38	1.63	100.00	8.764	0.054	2.387	0.338	0.156	0.125	0.086	0.243	12.153
#2-7	68.38	0.60	14.24	2.77	0.83	0.78	0.43	1.41	87.44	75.92	0.68	16.28	3.17	0.95	0.89	0.49	1.61	100.00	8.876	0.060	2.244	0.310	0.166	0.112	0.110	0.241	12.118
#2-8	64.04	0.75	15.10	2.94	0.85	0.70	0.51	1.40	86.27	74.23	0.86	17.50	3.41	0.98	0.81	0.59	1.62	100.00	8.711	0.076	2.420	0.334	0.172	0.102	0.134	0.243	12.191
#2-9	69.48	0.51	14.52	2.90	0.74	0.69	0.61	1.22	90.64	76.63	0.56	16.01	3.20	0.81	0.77	0.68	1.34	100.00	8.937	0.049	2.201	0.312	0.141	0.096	0.153	0.200	12.089
#2-10	67.99	0.65	16.92	3.38	1.07	0.67	0.65	1.74	93.08	73.04	0.69	18.18	3.63	1.15	0.72	0.70	1.87	100.00	8.608	0.062	2.526	0.356	0.202	0.091	0.160	0.281	12.288
Average	**65.66**	**0.61**	**15.01**	**2.97**	**0.78**	**0.80**	**0.54**	**1.46**	**87.83**	**74.77**	**0.70**	**17.08**	**3.38**	**0.89**	**0.91**	**0.61**	**1.66**	**100.00**	**8.769**	**0.062**	**2.362**	**0.331**	**0.155**	**0.115**	**0.139**	**0.249**	**12.182**
Std Dev	1.95	0.10	0.78	0.22	0.13	0.09	0.12	0.15	2.36	1.08	0.12	0.68	0.22	0.13	0.12	0.13	0.16	0.00	0.099	0.011	0.102	0.022	0.024	0.015	0.030	0.025	0.062
237-3																											
#3-1	56.05	0.52	20.33	5.13	1.48	0.86	0.84	1.58	86.78	64.59	0.60	23.43	5.91	1.70	0.99	0.97	1.82	100.00	7.802	0.055	3.335	0.597	0.307	0.128	0.226	0.281	12.729
#3-2	61.14	0.46	19.08	4.31	1.55	0.91	0.62	1.43	89.50	68.31	0.51	21.32	4.82	1.73	1.02	0.70	1.60	100.00	8.147	0.046	2.998	0.481	0.307	0.130	0.161	0.243	12.511
#3-3	55.60	0.66	21.87	5.53	1.43	1.05	0.74	1.70	88.78	62.85	0.75	24.83	6.23	1.61	1.18	0.83	1.92	100.00	7.628	0.068	3.523	0.633	0.291	0.153	0.196	0.297	12.789
#3-4	80.65	0.67	20.95	5.02	1.49	0.96	0.74	1.49	91.97	65.95	0.73	22.78	5.46	1.62	1.04	0.80	1.62	100.00	7.921	0.066	3.224	0.549	0.290	0.134	0.187	0.248	12.619
#3-5	58.01	0.61	22.89	5.85	1.74	1.00	0.64	1.75	92.50	62.71	0.66	24.75	6.32	1.88	1.09	0.69	1.89	100.00	7.610	0.061	3.540	0.642	0.339	0.141	0.163	0.293	12.788
#3-6	61.32	0.68	21.55	3.22	1.86	0.97	0.47	1.21	91.08	67.32	0.75	23.65	3.54	1.83	1.07	0.52	1.33	100.00	7.973	0.067	3.302	0.350	0.323	0.135	0.119	0.200	12.469
#3-7	57.41	0.64	20.23	5.18	1.56	0.86	0.70	1.65	88.23	65.07	0.73	22.93	5.87	1.76	0.98	0.79	1.87	100.00	7.852	0.066	3.261	0.593	0.317	0.127	0.185	0.268	12.688
#3-8	54.09	0.90	22.43	5.70	1.74	1.05	0.65	1.75	88.31	61.25	1.01	25.40	6.45	1.97	1.19	0.74	1.98	100.00	7.464	0.093	3.648	0.657	0.359	0.156	0.175	0.308	12.860
#3-9	55.86	0.60	20.76	5.54	1.70	1.04	0.54	1.54	87.59	63.77	0.69	23.70	6.32	1.95	1.19	0.62	1.78	100.00	7.723	0.063	3.383	0.641	0.351	0.154	0.148	0.271	12.732
#3-10	54.42	0.72	22.01	5.20	1.63	1.26	0.50	1.62	87.36	62.29	0.83	25.19	5.96	1.86	1.44	0.57	1.86	100.00	7.554	0.076	3.601	0.604	0.336	0.187	0.135	0.287	12.781
Average	**57.47**	**0.65**	**21.21**	**5.07**	**1.60**	**1.00**	**0.64**	**1.57**	**89.21**	**64.41**	**0.73**	**23.78**	**5.69**	**1.79**	**1.12**	**0.72**	**1.76**	**100.00**	**7.767**	**0.066**	**3.381**	**0.575**	**0.322**	**0.145**	**0.169**	**0.272**	**12.696**
Std Dev	2.73	0.12	1.16	0.78	0.11	0.12	0.12	0.17	2.00	2.28	0.13	1.26	0.90	0.13	0.14	0.13	0.20	0.00	0.211	0.012	0.200	0.095	0.024	0.019	0.032	0.032	0.127

Table 18. *(Continued)*

237-4																									
#4-2500x-1	60.55	0.63	21.35	4.78	1.49	0.91	0.42	1.45	91.59	66.11	0.69	23.31	5.21	1.63	0.99	0.46	1.59	100.00	7.914	0.062	3.289	0.522	0.291	0.127	0.107	0.242	12.554
#4-2500x-2	63.10	0.61	21.32	5.30	1.53	1.00	0.43	1.34	94.61	66.69	0.64	22.53	5.60	1.61	1.06	0.45	1.42	100.00	7.985	0.058	3.180	0.560	0.288	0.136	0.105	0.216	12.528
#4-2500x-3	59.58	0.91	21.47	5.66	1.54	1.04	0.56	1.26	92.02	64.74	0.99	23.33	6.16	1.67	1.14	0.60	1.37	100.00	7.803	0.090	3.314	0.620	0.301	0.147	0.141	0.211	12.626
#4-2500x-4	65.41	0.34	15.79	3.88	1.05	0.68	0.34	0.91	88.40	73.99	0.38	17.87	4.39	1.19	0.77	0.39	1.03	100.00	8.685	0.034	2.471	0.431	0.208	0.097	0.089	0.154	12.167
#4-2500x-5	59.23	0.56	22.03	5.20	1.50	0.86	0.30	1.25	90.94	65.13	0.61	24.23	5.72	1.65	0.95	0.33	1.37	100.00	7.810	0.055	3.424	0.573	0.295	0.122	0.077	0.210	12.567
#4-2500x-6	59.30	0.70	21.12	5.47	1.42	0.91	0.28	1.26	90.46	65.56	0.78	23.35	6.05	1.56	1.00	0.31	1.40	100.00	7.872	0.070	3.305	0.807	0.280	0.129	0.072	0.214	12.549
#4-2500x-7	60.90	0.53	19.85	5.20	1.35	0.67	0.28	1.26	90.04	67.63	0.59	22.04	5.78	1.50	0.74	0.31	1.40	100.00	8.078	0.053	3.103	0.577	0.268	0.095	0.073	0.213	12.460
#4-2500x-8	60.62	0.28	19.40	6.51	1.32	0.53	0.67	1.01	90.33	67.11	0.30	21.47	7.21	1.47	0.58	0.74	1.12	100.00	8.072	0.028	3.044	0.725	0.263	0.075	0.173	0.172	12.551
#4-2500x-9	59.55	0.50	21.57	5.52	1.33	0.64	0.28	1.11	90.51	65.80	0.56	23.63	6.10	1.47	0.70	0.31	1.23	100.00	7.880	0.050	3.364	0.611	0.263	0.090	0.072	0.188	12.518
#4-2500x-10	53.74	0.44	20.83	5.68	1.40	0.61	0.36	1.24	84.29	63.75	0.52	24.71	6.74	1.66	0.73	0.43	1.47	100.00	7.697	0.047	3.517	0.680	0.299	0.094	0.100	0.226	12.660
Average	**60.20**	**0.55**	**20.47**	**5.32**	**1.39**	**0.78**	**0.39**	**1.21**	**90.32**	**66.65**	**0.61**	**22.67**	**5.89**	**1.54**	**0.87**	**0.43**	**1.34**	**100.00**	**7.980**	**0.055**	**3.201**	**0.591**	**0.276**	**0.111**	**0.101**	**0.205**	**12.518**
Std Dev	2.99	0.18	1.83	0.68	0.15	0.18	0.13	0.16	2.66	2.82	0.19	1.95	0.78	0.15	0.18	0.14	0.17	0.00	0.275	0.018	0.293	0.081	0.028	0.024	0.033	0.026	0.135
237-5																									
#5-1	38.04	0.47	15.59	4.87	1.66	12.62	0.26	2.08	75.61	50.31	0.62	20.62	6.45	2.20	16.69	0.37	2.75	100.00	6.641	0.061	3.208	0.712	0.432	2.360	0.096	0.463	13.973
#5-2	37.82	0.36	13.65	4.08	1.30	11.01	0.07	1.83	70.13	53.93	0.51	19.46	5.82	1.86	15.70	0.09	2.61	100.00	7.010	0.050	2.981	0.633	0.360	2.187	0.024	0.433	13.678
#5-3	35.58	0.57	14.51	4.39	1.37	11.07	0.08	1.97	69.54	51.16	0.82	20.86	6.31	1.97	15.92	0.12	2.83	100.00	6.715	0.081	3.227	0.693	0.384	2.239	0.031	0.475	13.844
#5-4	40.44	0.52	16.14	5.05	1.66	13.50	0.26	2.19	79.75	50.70	0.66	20.23	6.33	2.08	16.93	0.33	2.74	100.00	6.689	0.065	3.146	0.698	0.409	2.394	0.084	0.461	13.946
#5-5	36.21	0.52	14.36	4.64	1.39	13.51	0.17	2.25	73.05	49.58	0.71	19.66	8.35	1.91	18.49	0.24	3.08	100.00	6.605	0.071	3.087	0.707	0.379	2.640	0.061	0.523	14.072
#5-6	39.38	0.39	15.71	4.94	1.74	10.93	0.43	2.15	75.69	52.03	0.52	20.76	6.53	2.30	14.44	0.57	2.85	100.00	6.803	0.051	3.199	0.714	0.449	2.023	0.144	0.475	13.856
#5-7	39.95	0.47	15.86	4.48	1.60	9.52	0.27	2.13	74.26	53.79	0.64	21.35	6.03	2.15	12.81	0.36	2.87	100.00	6.943	0.062	3.247	0.651	0.414	1.772	0.091	0.473	13.653
#5-8	38.54	0.43	16.41	4.72	1.81	12.95	0.29	2.42	77.56	49.69	0.56	21.16	6.08	2.33	16.70	0.37	3.12	100.00	6.569	0.055	3.297	0.673	0.459	2.366	0.095	0.526	14.038
#5-9	36.83	0.54	15.10	4.79	1.67	13.25	0.26	2.06	74.51	49.43	0.73	20.27	6.43	2.24	17.78	0.35	2.77	100.00	6.564	0.073	3.172	0.714	0.444	2.529	0.090	0.469	14.056
#5-10	43.91	0.41	15.96	4.46	1.75	8.83	0.43	2.21	77.95	56.33	0.52	20.47	5.72	2.24	11.32	0.55	2.84	100.00	7.195	0.050	3.082	0.611	0.427	1.550	0.136	0.462	13.513
Average	**38.67**	**0.47**	**15.33**	**4.64**	**1.60**	**11.72**	**0.25**	**2.13**	**74.81**	**51.70**	**0.63**	**20.48**	**6.21**	**2.13**	**15.68**	**0.34**	**2.84**	**100.00**	**6.773**	**0.062**	**3.165**	**0.681**	**0.416**	**2.206**	**0.085**	**0.476**	**13.863**
Std Dev	2.42	0.07	0.89	0.29	0.18	1.69	0.12	0.16	3.27	2.31	0.10	0.60	0.28	0.17	2.23	0.16	0.15	0.00	0.212	0.010	0.093	0.037	0.033	0.338	0.039	0.028	0.192
Pre-Run Standards																									
AMAB	68.41	0.06	21.02	0.08	0.22	0.19	12.35	0.17	102.49	66.74	0.06	20.51	0.08	0.22	0.19	12.05	0.16	100.00	8.059	0.006	2.918	0.008	0.039	0.024	2.821	0.025	13.899
KAHB	40.79	5.01	14.97	11.34	13.37	10.14	3.05	2.11	100.79	40.48	4.97	14.85	11.25	13.27	10.06	3.02	2.10	100.00	5.603	0.517	2.423	1.303	2.738	1.493	0.812	0.370	15.259
KAHB-2	40.66	4.73	14.95	11.33	13.30	10.02	2.76	2.15	99.91	40.71	4.73	14.97	11.34	13.31	10.03	2.76	2.15	100.00	5.629	0.492	2.439	1.311	2.744	1.486	0.740	0.379	15.219
KAHB-3	40.50	4.63	14.86	11.25	13.38	10.21	2.92	2.08	100.08	40.48	4.63	14.87	11.25	13.37	10.20	2.92	2.08	100.00	5.603	0.503	2.427	1.302	2.759	1.513	0.784	0.367	15.257

CERAMIC PIPES AND PIPE SHERDS

Tuinier Farm

Two complete elbow pipes have been found with one or two of the three Late Caddo burials at the Tuinier Farm site. The first pipe has had the back end of the stem turned up vertically against the back end of the bowl, with indentations where the bowl and wrapped-around stem meet. It is decorated with four hatched engraved triangles pendant from the bowl (Figure 37a-b). Identical elbow pipe forms have been reported from 17th century Caddo components at the Culpepper site (Scurlock 1962:Figure 7h), the McClure and Foster sites in the southwest Arkansas portion of the Great Bend region of the Red River (Moore 1912:638 and Figure 136b-d) as well as the Clements site (41CS25) in the Black Bayou drainage (Gonzalez et al. 2005:Figures 4.13 and 4.14a). The second elbow pipe is plain (3 cm bowl diameter), and also has part of the stem folded up onto the front of the bowl (Figure 38a-b).

Six pipe sherds or pipe sherd sections, all from grog-tempered elbow pipes, have been found in the 2007 excavations in the southern midden (Midden 1) at the Tuinier Farm. These include a plain stem fragment and two plain bowl rim sherds. The other pipe sherds are from probably two different decorated pipes.

The first decorated pipe (Unit 4, 20-30 cm bs) has two horizontal engraved lines and rows of small circular punctates on the elbow pipe stem (Figure 39b-b'). The punctates occur in two rows between the engraved lines and in a third row underneath the engraving. In addition, there is at least one row of circular punctates that extends vertically down the stem towards the bowl-stem attachment. The stem is a maximum of 37 mm in height, with an exterior orifice diameter of 24.9 mm; the stem is 5.6 mm thick. The second pipe is a bowl with diagonal and semi-circular engraved elements separated by a narrow band of rocker stamping (Figure 39a).

Anglin

The excavations at the Anglin site have recovered four elbow pipe sherds from four different grog-tempered pipes; two of the pipe sherds have a naturally sandy clay paste. Three of these sherds are undecorated, including a pipe bowl rim (direct profile with a rounded lip), a flat-lipped stem, and a sherd from the lower portion of the stem. The fourth elbow pipe sherd is a flat-lipped stem (grog-tempered, with a sandy paste) with a single horizontal engraved line below the lip and at least one hatched triangle pendant from the horizontal line (Figure 40). One of the complete pipes from the Tuinier Farm site has the same engraved motif, except executed on the bowl rather than the stem (see Figure 37a).

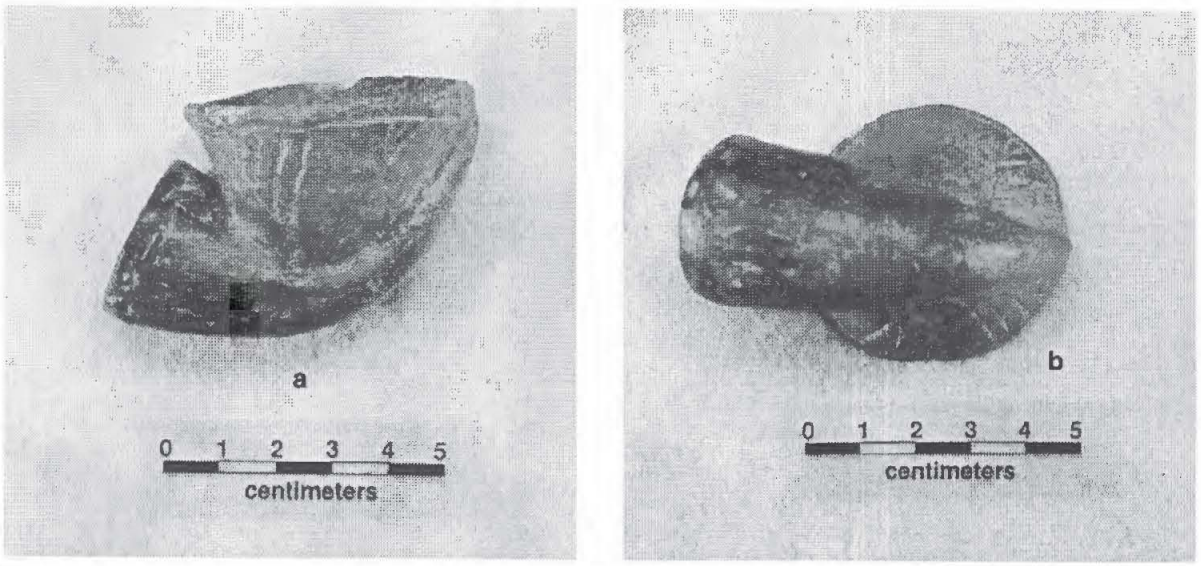


Figure 37. Engraved elbow pipe: a, side view; b, view of stem and engraved bowl.

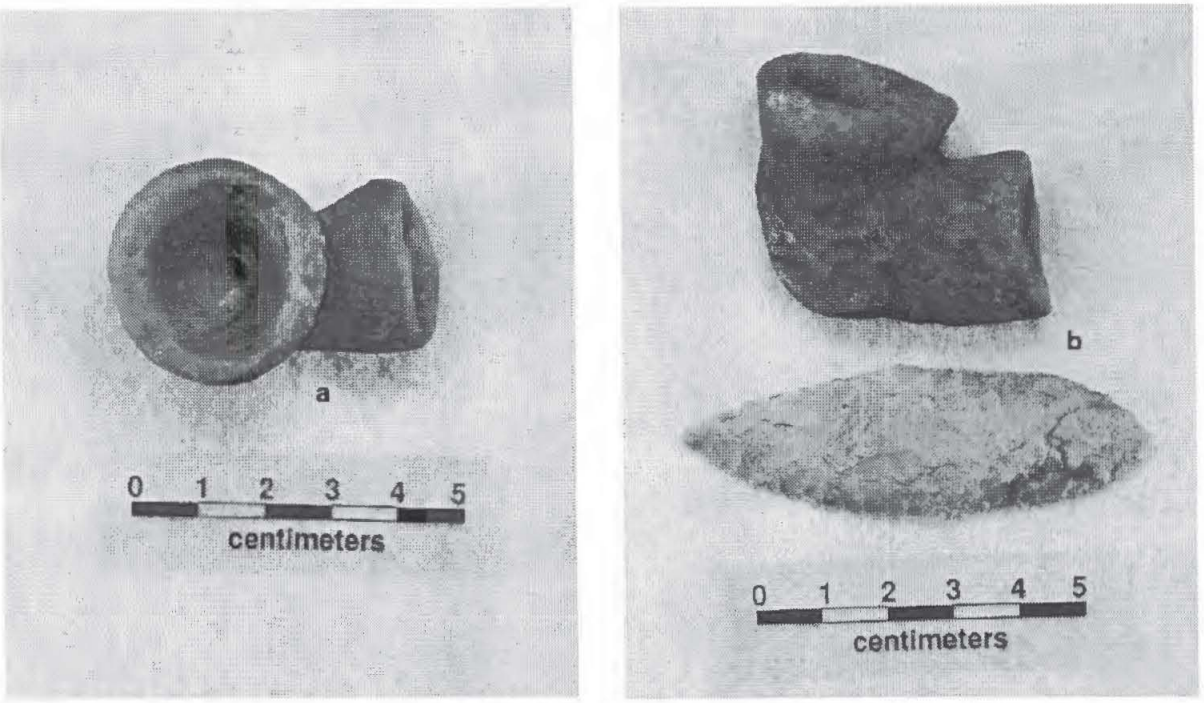


Figure 38. Plain elbow pipe: a, top down view; b, side view, with beveled knife found in the burial.

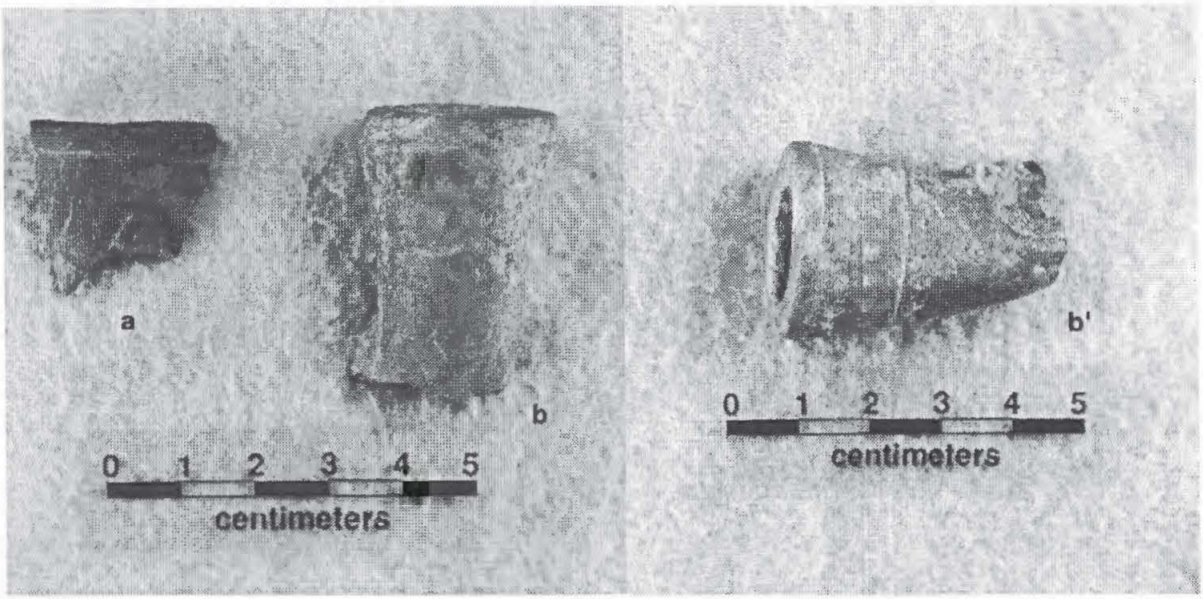


Figure 39. Elbow pipe sherds from the Tuinier Farm midden excavations: a, engraved-rocker stamped elbow pipe bowl; b, engraved-punctated elbow pipe stem; b', side view of engraved-punctated elbow pipe stem. Provenience: a, Unit 1, 10-20 cm bs; b-b', Unit 4, 20-30 cm bs.

FIGURINES, EAR SPOOLS, AND OTHER CLAY OBJECTS

The Stouts Creek sites have an assortment of clay objects of varying forms, including fragmentary pieces of low-fired clay figurines from both the Tuinier Farm and Anglin sites and a number of ear spools from the midden excavations at Anglin. Such objects, especially figurines, are very rare on Caddo sites of any age, and ear spools when found in Titus phase contexts are usually recovered in burial features (see Turner 1978).

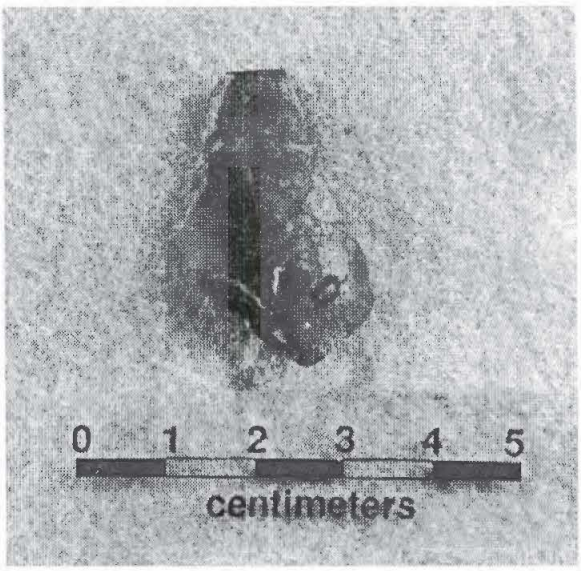


Figure 40. Engraved pipe sherd from general contexts at the Anglin site.

Although the function or functions of figurines found at the Stouts Creek sites is not known, it is doubtful that they were used as toys, an explanation offered for the figurines found on Plains Village sites on the southern Plains (Bell 1984:320). Their rarity on Caddo sites suggests use as anything other than toys. Newell and Krieger (1949:151) note that the animal and human figurines found at the George C. Davis site were intentionally broken across the neck or torso, and they hint at both their ceremonial and magical use by Caddo peoples at that site.

Aboriginal societies in the Southeastern U.S., including the Caddo area (see Swanton 1942:163-166, 211-216), had ideological systems that defined a close relationship between humans and animals, perceiving both to occupy a conceptual category of "intellectual beings." Thus, beliefs and myths would often allude to the descent of humans from animal ancestors (in the case of the Caddo, this would include bears, dogs, beavers, and coyotes [Swanton 1942:215]), and then attribute a host of anthropocentric characteristics to animals, including powers or qualities to which humans aspire. Animals are often responsible in myths for defining or illustrating cosmic relationships. Therefore, a closeness between humans and animals, disclosed in myths and demonstrated in rituals, suggest that animal and human figurines (miniature animals and humans, cf. Laugrand and Oosten 2008) may well be powerful symbols of religious and cosmological beliefs for the Stouts Creek Caddo peoples. Such figurines may also have held transformative properties in myths and rituals, transforming beings in life and death.

Tuinier Farm

There are two possible clay figurine fragments in the general collections at the Tuinier Farm, both possible leg or limb pieces (Figure 41c, f). One is at least 39.5 mm in length and 11 mm in width, while the other is 19 mm in diameter.

There is also a flat spatula-shaped fired clay piece (see Figure 41e) in the general collections; similar pieces have been found at the Anglin site. The one from Tuinier Farm is 58 x 18 x 7.2 mm in length, width, and thickness. Its function is unknown.

One of the clay objects previously found in a general context at Tuinier Farm is a 25 mm long clay bead (Figure 42a-b). A second bead—15.5 mm in diameter—was found in Unit 2 excavations in the northern midden (see Figure 41b). A small clay ball or bead (16.5 mm in diameter) was also recovered in the southern midden (see Figure 41a).

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The collection has a single clay object. It is a small clay ball approximately 14 mm in diameter. Similar clay balls have been recovered from the excavations in the Anglin midden (see below).

Anglin

A wide assortment of clay objects have been found at the Anglin site, in numbers not previously seen in Late Caddo Titus phase sites. These clay objects include figurines and figurine fragments, small clay balls, clay beads, and several ear spools (Table 19), as well as other pieces of uncertain function or use.

The one notched clay piece, with three notches, is a tabular piece of clay at least 25 mm in length and 8.9 mm in thickness (Figure 43a). The clay has pieces of temper in its paste.

There are two oblong pieces of clay from the Anglin site that are referred to as clay squeezes because they both have fingerprint impression on them (Figure 44a-b). These range from 32-48 mm in length, 18-23 mm in width, and 17-22 mm in thickness. These may be the beginnings of unfinished figurines, or extra wide and thick clay coils, rather than morphologically purposeful clay artifacts.

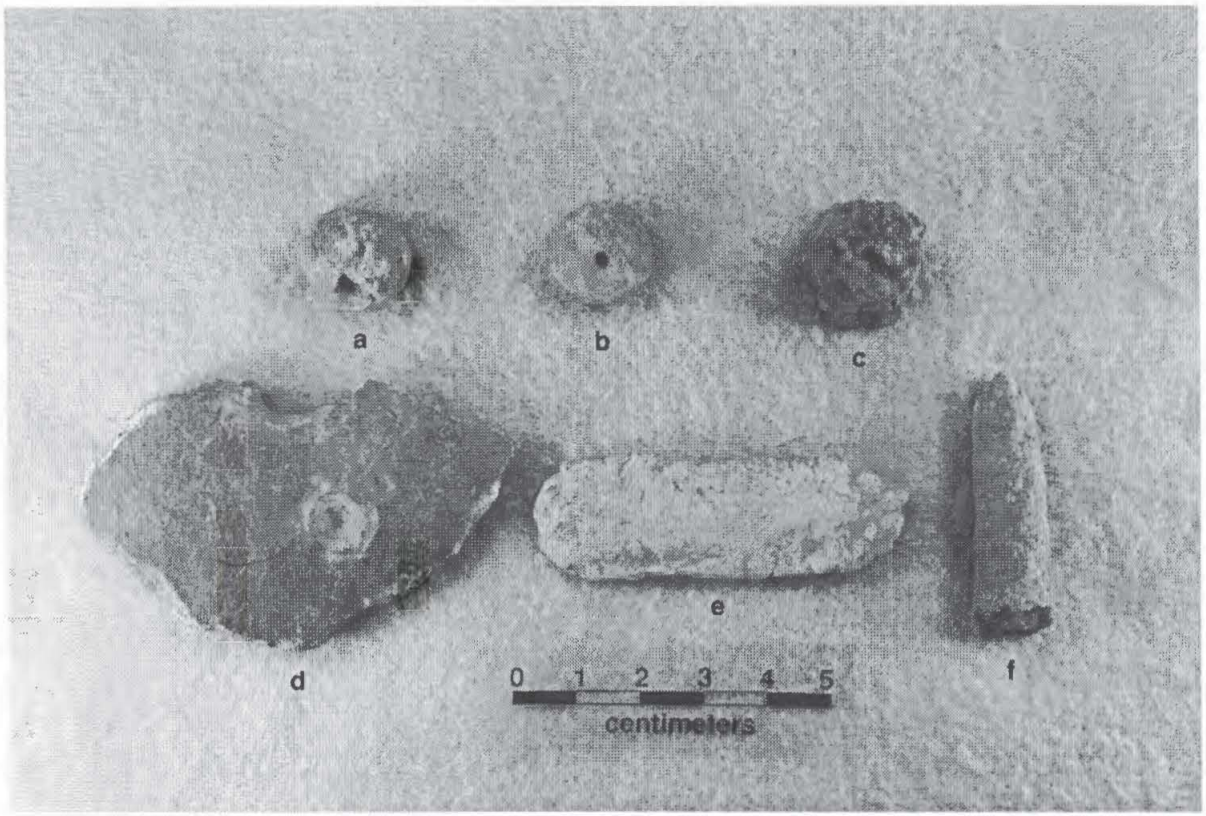

Figure 41. Clay objects and spindle whorl from the Tuinier Farm: a, small clay ball or bead; b, bead; c, f, possible figurine fragments; d, spindle whorl; e, spatula-shaped clay piece. Provenience: a, Unit 4, 20-30 cm; b, Unit 2, 20-30 cm; c, e-f, General contexts; d, Unit 2, 10-20 cm.

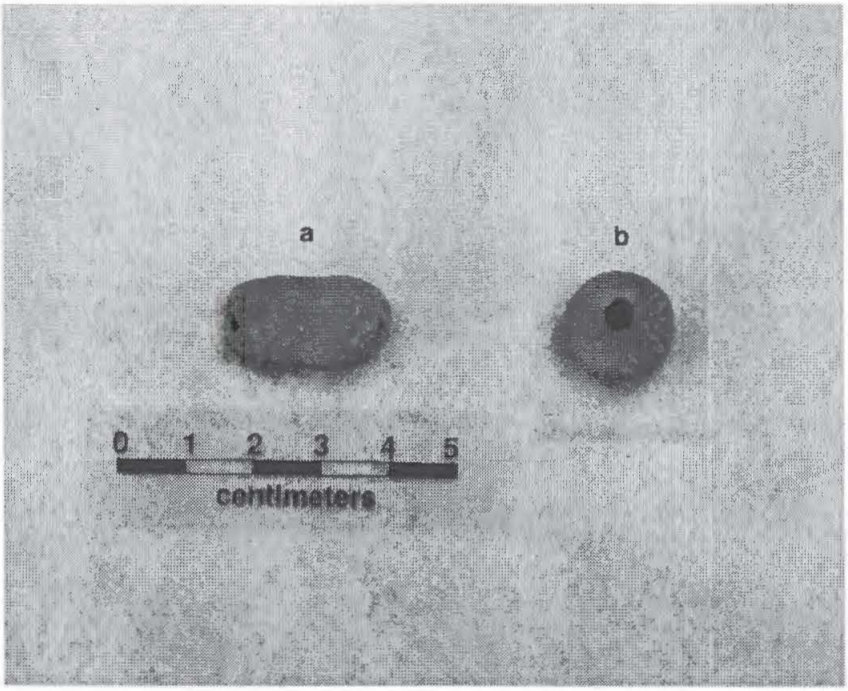

Figure 42. Clay bead from the Tuinier Farm site: a, side view; b, end view, showing perforation.

Eight small and roughly round clay balls have been found in the Anglin midden, five with protrusions (Figure 45a-d); the purpose of the protrusions on some of the clay balls is not known, though they may have been designed to assist with the attachment of the clay balls to another object. These are not well-shaped or smoothed, but are lumpy; none have perforations. Two of the three clay balls without protrusions have fingerprint impressions (Figure 46a) and another is hollowed-out on one side of the piece (see Figure 43c). These clay balls range between 20-24 mm in diameter; the clay balls with protrusions are slightly larger, ranging from 21-43 mm in diameter.

There are three clay perforated beads designed for suspension on a string. One is tubular-shaped, and 15 x 11 x 11 mm in length, width, and thickness, while the other two are rectangular-shaped (see Figure 43b). These range from 14-19 mm in length and 10-14 mm in width.

Four clay pieces are relatively flat and spatula-shaped, with one rounded end (Figure 47a-c). One of these has a raised clay protrusion or attachment at one end of the piece. These clay pieces range from 15-20 mm in width, 7.7-12 mm in thickness, and are at least 29-35 mm in length.

Another interesting category of clay objects from the Anglin site are five clay pieces that have clearly defined tapered points on them (Figure 48a-d). These range from one rounded piece (38 x 26 mm in length and width) to finely-shaped and narrow tubular pieces (8-15 mm in width and 23-26 mm in length), each with a point at one end. One of the narrow tubular tapered point clay objects has a hole at one end, as if it was meant to fit onto a stick or some other sort of holder.

Table 19. Clay objects from the Anglin site.

Description of clay object	No.	Percent
Notched piece	1	1.9
Clay squeeze with fingerprint impressions	2	3.8
Clay ball	3	5.7
Clay ball with protrusion	5	9.4
Clay bead	3	5.7
Flat spatula-shaped piece	4	7.7
Clay piece with tapered point	5	9.4
Figurine, basal fragment	1	1.9
Figurine fragment	2	3.8
Figurine, quadruped	1	1.9
Figurine, possible legs	2	3.8
Figurine, anthropomorphic	1	1.9
Figurine, rectangular/tabular fragment	8	15.1
Figurine, blocky body or torso fragments	6	11.3
Ear spool	9*	17.0
Totals	53	100.0

*one is a possible ear spool, resembling a small clay ball with an interior circular projection like several of the identifiable ear spools

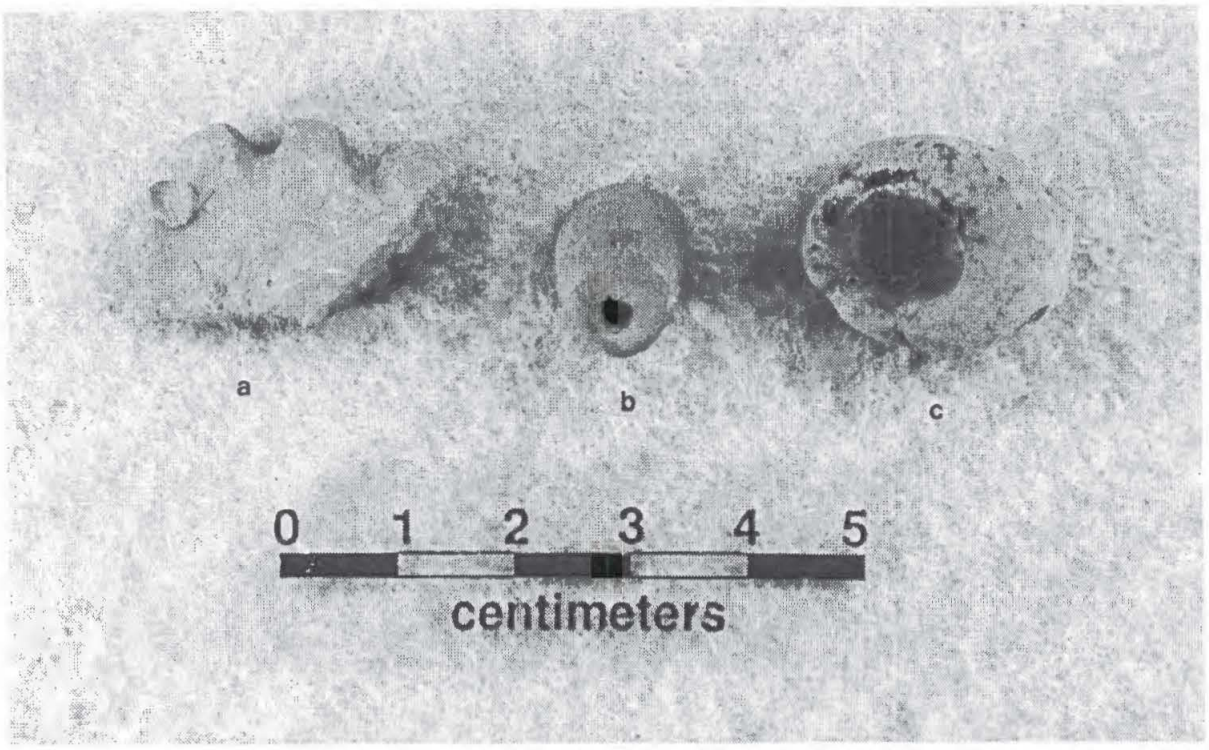

Figure 43. A notched clay piece, a clay bead, and a partially hollowed-out clay ball from the Anglin site midden excavations.

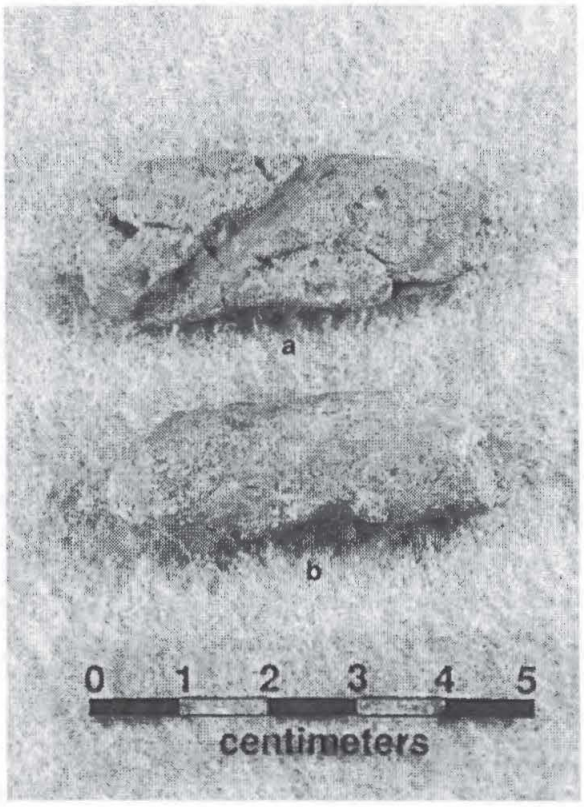

Figure 44. Clay squeezes from the Anglin site midden excavations.

Figurines

One of the figurines from general midden contexts at the Anglin site (and not included in the counts in Table 19) is a small zoomorphic figure, possibly a bird or owl, sitting down with two legs in the front of the body. The head has two eyes and a mouth (Figure 49). There are 21 other figurine pieces from the Anglin site (see Table 19). None of the figurines from the Anglin site resemble horses, which are a common form of figurines in post-1720 archaeological contexts in parts of the Southern Plains and the Red River, including at least two historic Caddo sites, Womack (41LR1, Harris et al. 1965:303) and Roseborough Lake (41BW5, Miroir et al. 1973:Figure 6e). Figurines on Caddo sites predating the 18th century are quite rare, as discussed below.

The other figurine fragments from the Anglin site consist of unidentified rectangular or tabular fragments (n=8) that may be body or torso pieces (one has fabric impressions on one side and another has fingerprint impressions), another six blocky torso or body pieces (animal or human), including one with a protrusion or appendage, three that are leg/limb or basal pieces (including one identical to a figurine fragment from 18th century Caddo

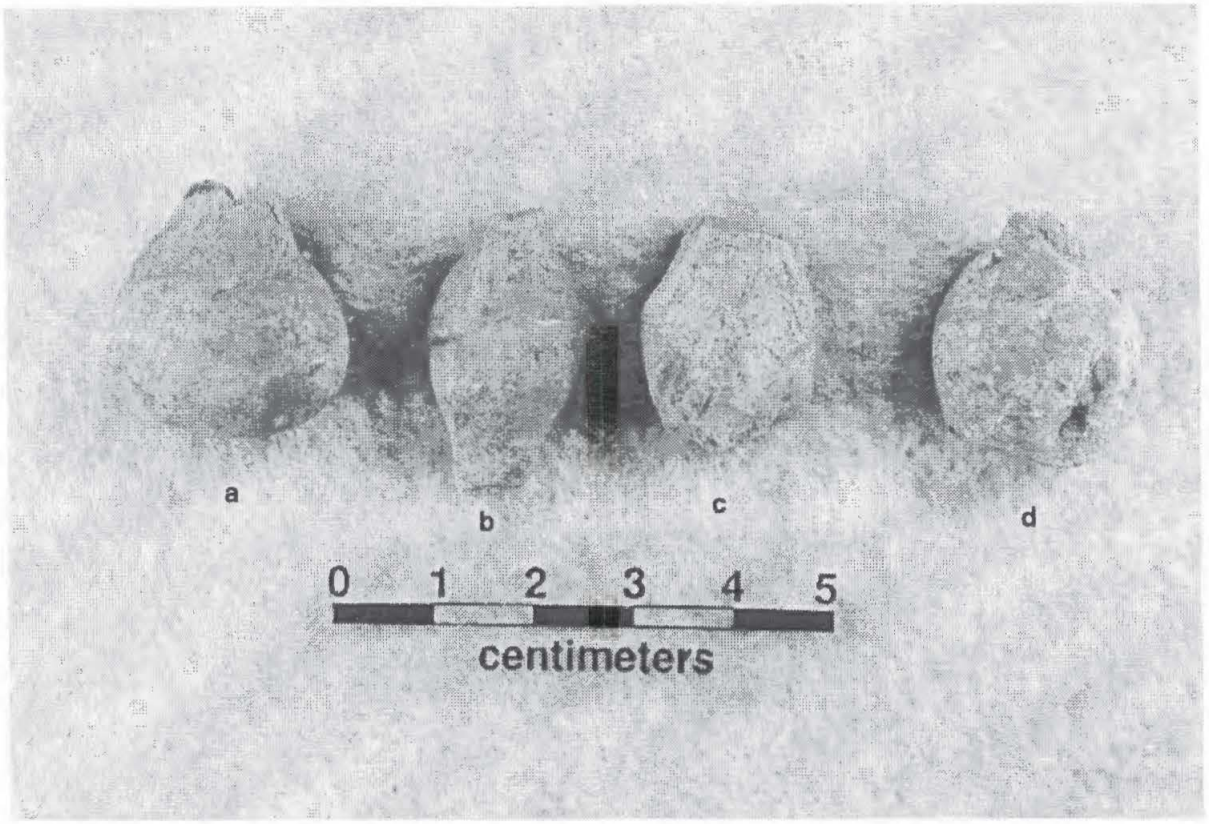

Figure 45. Clay balls with protrusions from the Anglin site midden excavations.

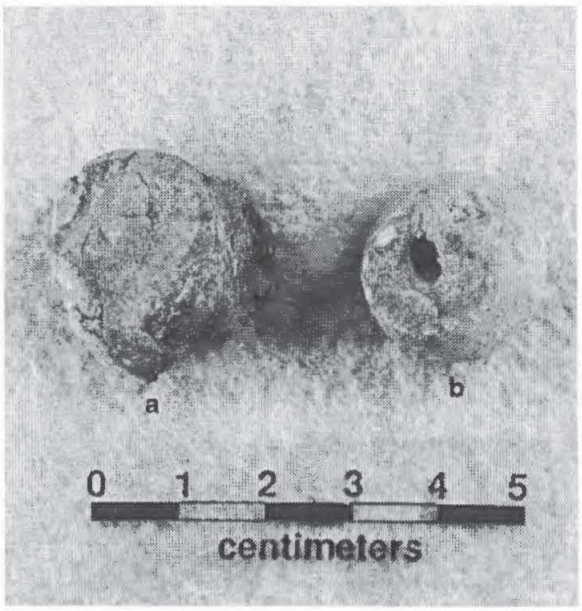

Figure 46. Clay ball and bead from the Anglin site midden excavations.

contexts at the Roseborough Lake site [Miroir et al. 1973:Figure 6g]), and two small rectangular pieces of uncertain location on the figurine (Figure 50a-c, e). One of the rectangular or tabular fragments has a small hole at its base, probably to facilitate fitting it on a stick or other kind of holder. Marlin Hawley (2008 personal communication) suggests that these holes are put into solid clay objects in order to keep them from shattering during firing.

A more complete figurine is anthropomorphic, with two legs and the area for a head (see Figure 50d). This figurine is 44 x 23 x 17 mm in length, width, and thickness. The last figurine is a quadruped, possibly a bear or dog (Figure 50f-f'). It is 45 mm in length and 21 mm in width.

Clay figurines from Caddo sites are found from pre-A.D. 1000 to post-18th century times, but are nowhere abundant anywhere in the Caddo area. The quantity of figurine fragments found at the Anglin site is noteworthy and completely unexpected. The fragmentary animal and human figurines from Anglin are much like other low fired clay figurines on Caddo and Southern Plains settlements.

Discoveries of early Caddo figurines include a large anthropomorphic figurine from a shaft tomb in one of the mounds at the Crenshaw site on the Red River in southwest Arkansas (Ann M. Early, 2008 personal communication). At the George C. Davis

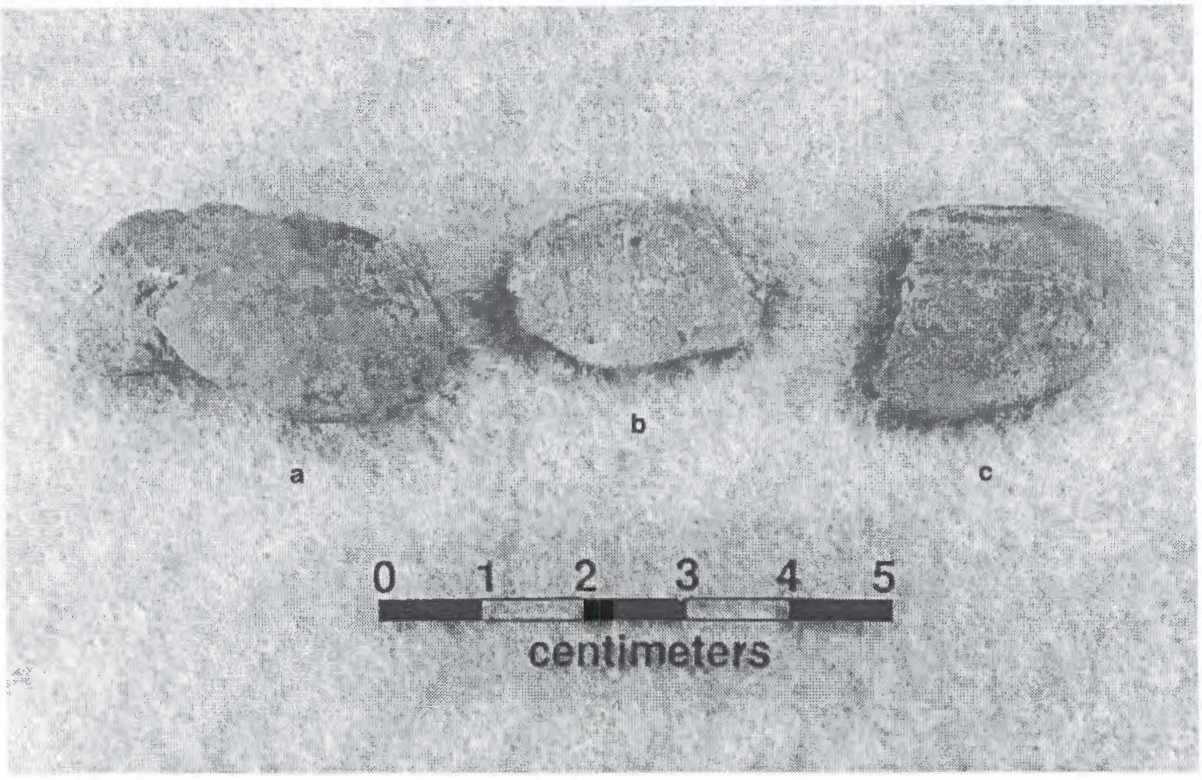

Figure 47. Spatula-shaped clay objects from the Anglin site midden excavations.

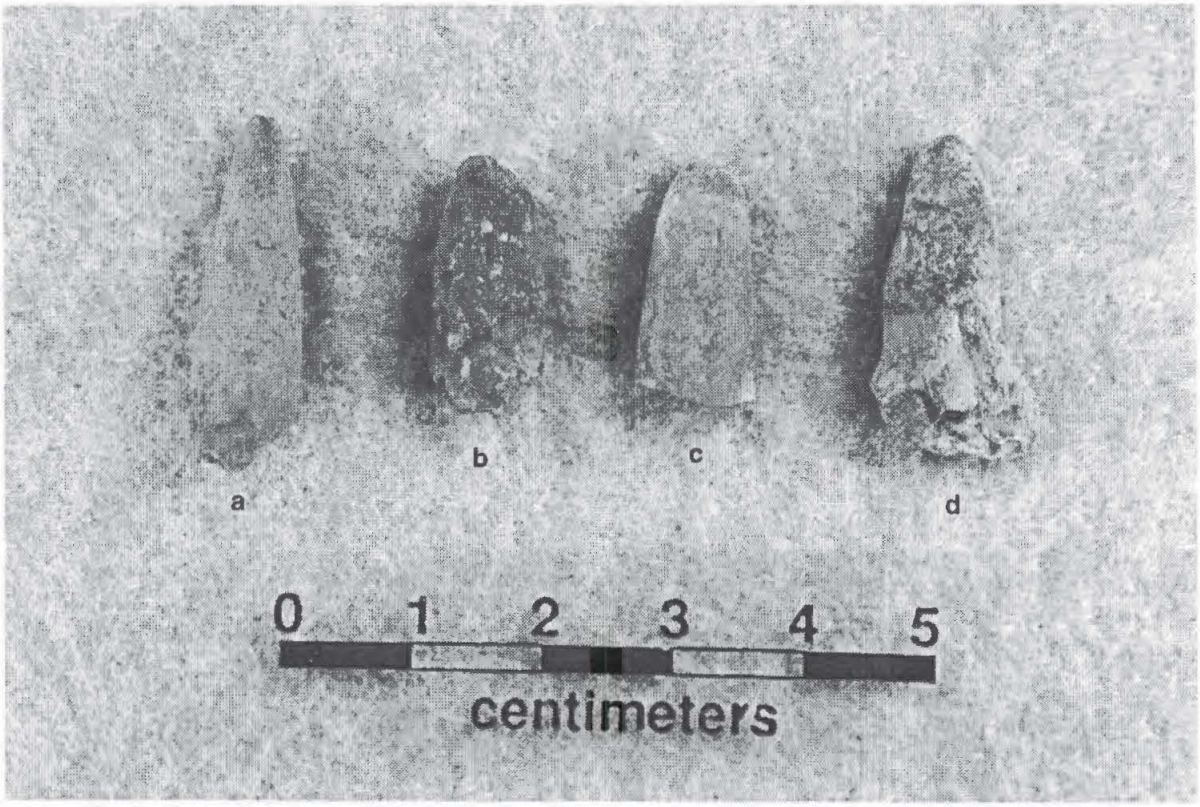

Figure 48. Clay objects with tapered points from the Anglin site midden excavations.

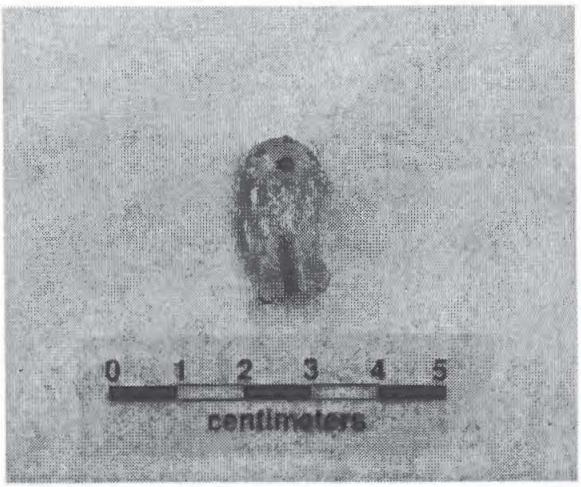

Figure 49. Possible bird or owl figurine from the Anglin site.

site on the Neches River in East Texas, in pre-A.D. 1300 archaeological deposits, there are parts of what are considered both human (n=4) and animal figurines (n=11) from the area of the Mound A excavations. The human figurines include head and body fragments (Newell and Krieger 1949:Figure 52s-t, v, x); the heads have punched eyes and mouth, with a shallow groove encircling the neck. The animal figurines include elongated limbs (Newell and Krieger 1949:Figure 52w), one possible dog head, and two quadrupeds.

Webb (1948:127-128 and Plate 16:4) has reported on figurine fragments from several Bossier phase sites in northwestern Louisiana. They are human torso fragments; Webb (1948:128) estimates that complete figurines would have been from 5-8 cm in height. There are human and animal figurines (bird and dog) at the Belcher site on the Red River in northwestern Louisiana (Webb 1959:176-177 and Figures 13f, 22a, and 35g); two may have been attached to pottery vessels. The one free-standing figurine is a small human figure (2.3 cm in height) with visible arms and hands folded across the upper torso. This figurine came from House 1, and probably dates from after ca. A.D. 1650, during the terminal Belcher phase occupation there. The contemporaneous McLelland site on the Red River in northwestern Louisiana had one human figurine fragment (Kelley 1997:55 and Figure 44), apparently the "lower portion of a human torso." It was found in the area of a possible ramada in domestic archaeological deposits. The early historic (ca. A.D. 1680-1714) Allen phase component at the Deshazo site in East Texas has four cylindrical-shaped pieces that may be fragments of modeled figurines (Fields 1995:227 and Figure 80a-b).

Historic Wichita sites along the Red River and elsewhere in the north central part of Texas (see Smith 1993:Figures 24j-l and 26g-h) do have quantities of clay figurines, as do some prehistoric Plains Village sites in the Washita River basin in south central Oklahoma (Bell 1984:Figure 14.3d-h). Hundreds of mostly broken figurines have been reported from the Spanish Fort complex of sites, which date from the mid- to late-18th and early 19th centuries (i.e., Bell 1967:Figures 47a-j and 57n-p). Identifiable pieces from these sites include complete and fragmentary human effigies, as well as quadrupeds, particularly horses and horses with riders. Bear, deer-like animals, and bird (probably owls) forms may also be depicted. Some of the anthropomorphic figures have separately modeled limbs, particularly legs.

An 18th century site on the Colorado River in west Texas reported by Skinner (1978) had a number of fragmentary figurines depicting humans (n=102), dogs, horses, and horses with saddles. According to Skinner (1978:41-42):

> All of the figures appear to be handmade by rolling and pinching the clay to form the desired shapes. There is no evidence of molding... Appendages are not well made and no attention was paid to creating fingers or feet. Most of the human figures are estimated to be about 10 cm high although one example is considerably smaller.

Ear Spools

The nine clay ear spools or ear ornaments from the Anglin occur in several different forms and sizes, with different ear attachments; none of them are decorated. Form A includes one large circular spool, 31 in diameter and 6 mm thick with a small interior conical plug or attachment (Figure 51d-d').

Form B (n=2) are tubular-shaped ear spools, with equal-sided flanges or sides, a shallow central groove, and no interior plug (see Figure 51b-b'); Turner (1978:Figure 21d) illustrates similar ear spools from burials at the Titus phase Tuck Carpenter site in the Big Cypress Creek basin and Webb (1959:Figure 138a) recovered one like it on the floor of House 2 in Belcher phase (ca. A.D. 1500-1650) contexts at the Belcher site. At Anglin, their diameters range from 18-19 mm; the one complete spool is 14 mm in height. Forms C (n=1) and D (n=1) are stylistically

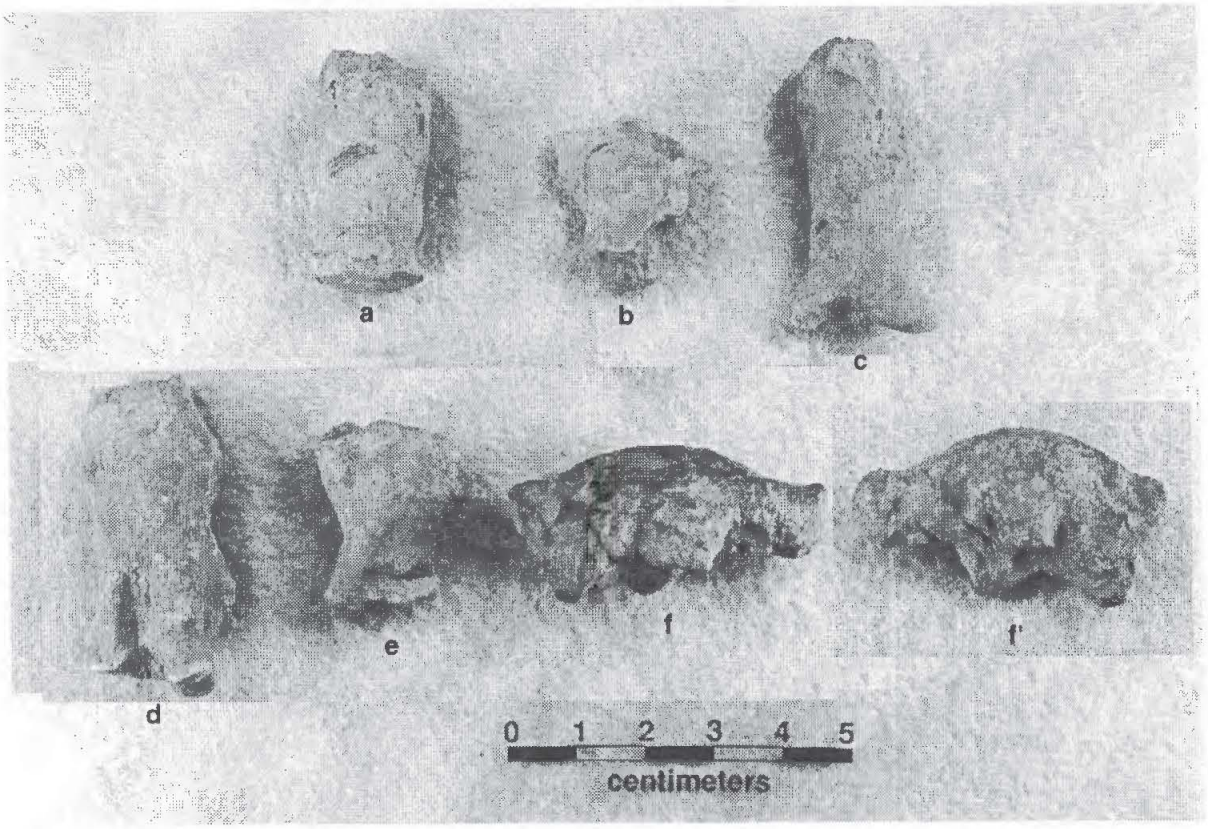

Figure 50. Figurine fragments from the Anglin site midden excavations.

related to the Form B spools in that they have equal-sided flanges and no interior plug (see Figure 51a-a' and e-e'). Forms C and D have deep central grooves; Turner (1978:Figure 21a) illustrates a Form C ear spool from a Tuck Carpenter burial. The Form C ear spool is 12 mm in height, while the Form D spool is 23 mm in diameter and 17 mm in height.

The Form E ear spool (n=1) at the Anglin site is circular in shape (see Figure 51c-c'), 19 mm in diameter, and very thin (2 mm), with a central interior plug or attachment that is 11 mm in diameter and height. A fragmentary ear spool piece from Unit 8 in the midden excavations may be from a second Form E ear spool. This piece is 17 mm in diameter and has a central interior plug.

The last ear spool form (Form F) includes two large circular disks (18-20 mm in diameter) with large central interior plugs (see Figure 51f-f'). These attachments stand 17-18 mm in height.

Perforated Sherds

Spindle whorls are disk-shaped sherds (usually base sherds) that have a central perforation or hole drilled in them. The spindle whorl would have been affixed on a spindle to help maintain its rotary motion during spinning activities. The presence of spindle whorls on these Caddo sites suggests that Caddo women at the Stouts Creek sites were processing fibers to produce textiles (cf. Alt 1999). 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.

Tuinier Farm

A single perforated sherd (with one complete perforation and a second partial perforation) comes from the northern Midden 2 at Tuinier Farm (see Figure 41d). The perforated sherd is from the base of a grog-tempered vessel.

Anglin

There are four perforated plain body and base sherds from the Anglin midden excavations. Each has a single perforation that ranges from 8.0-11.6 mm in diameter.

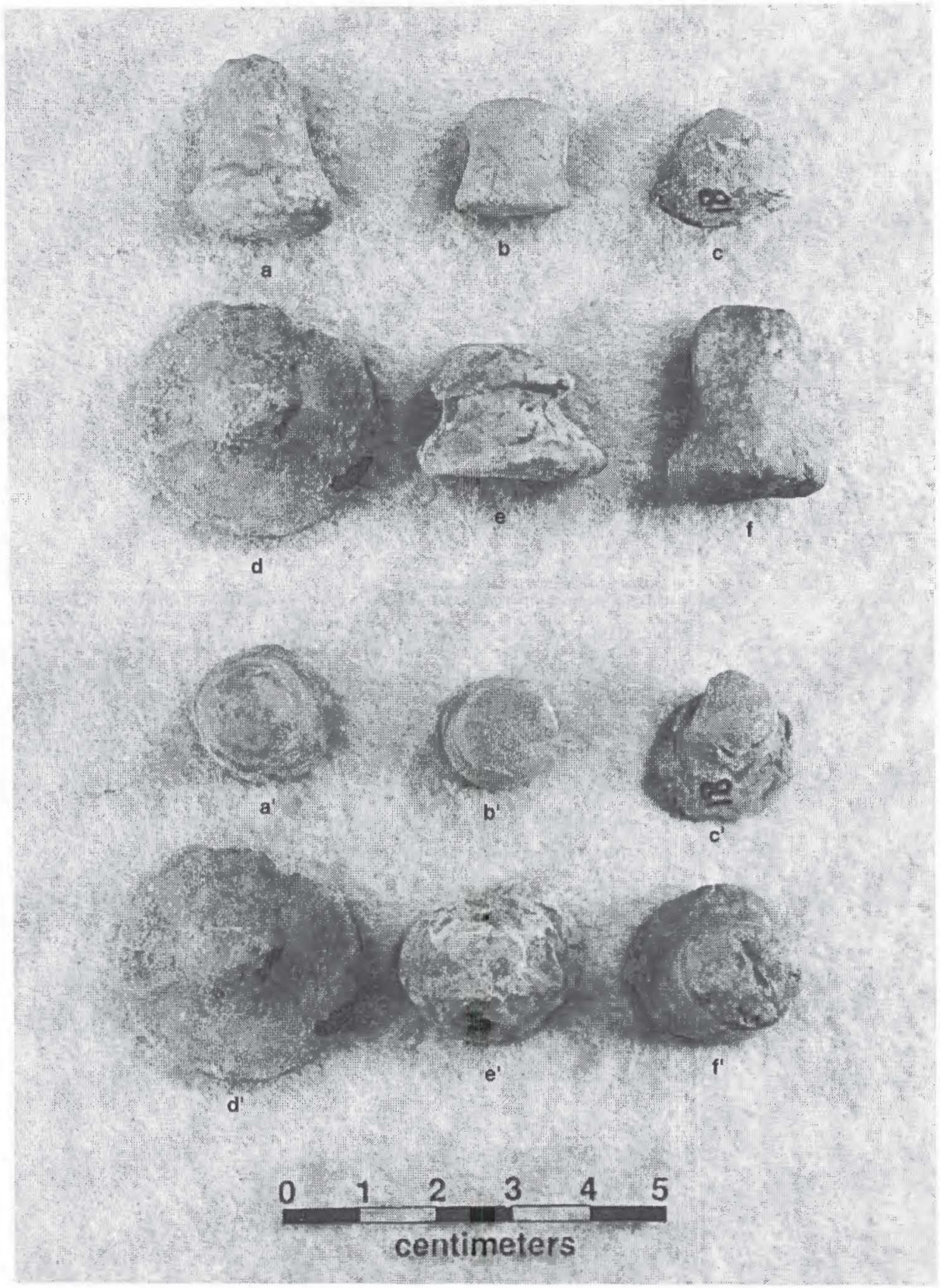

Figure 51. Ear spools from the Anglin site midden: a-a', Form C, b-b', Form B, c-c', Form E, d-d', Form A, e-e', Form D, f-f', Form F.

Clay Coils

Tuinier Farm

A single clay coil was recovered from excavations in the southern midden at the Tuinier Farm. Its discovery suggests that the Caddo were engaged in ceramic vessel manufacture at the site, because clay coils are the discarded remnants of the manufacture of coiled pottery vessels by Caddo potters that became exposed to fire and were preserved. They provide incontrovertible evidence for on-site ceramic vessel manufacture. The coils are roughened and unsmoothed.

Anglin

Clay coils and fragments of clay coils with rounded ends are numerous in the Anglin midden, as 27 clay pieces have been recovered in previous investigations here (Figure 52a-e). At Anglin, the clay coils and fragments are preserved as both narrow (n=18), between 6-12 mm in width, and wide (n=9) coils. The wide coils range from 13-24 mm in width.

Burned Clay and Daub

Tuinier Farm

A single piece of daub and at least 48 pieces of burned clay were found in the 2007 investigations at the Tuinier Farm. These pieces were found in both midden areas. The virtual absence of daub in the archaeological deposits suggests that the Caddo structures at the Tuinier Farm site may not have had a wattle and daub cover.

R. A. Watkins

There are six pieces of burned clay and six pieces of daub in the collection from this site. Their recovery suggests that clay-lined hearths, ovens, and daub-covered structures are likely present at the site.

Anglin

In addition to a piece from a mud-dauber nest, pieces of daub (n=214) and burned clay (n=638) are relatively abundant in the midden deposits at the Anglin site. As at the R.A. Watkins site, the recovery of daub and burned clay suggests that clay-lined hearths, ovens, and daub-covered structures are likely present in the area of the midden or at other locations at the site not far removed from the trash midden accumulation.

LITHIC ARTIFACTS

Tuinier Farm

A number of Late Caddo period triangular arrow points of the Maud and Talco types with concave bases have been found on the surface from the midden areas at the Tuinier Farm site (Figure 53). They are typically made of a heat-treated local quartzite.

In the borrow pit area at the southern end of the site, a wider range of arrow point forms made from a diverse range of lithic raw materials have been found in investigations led by Lee Green (Figure 54). They include triangular Maud and Talco points and stemmed arrow points ranging from Late Woodland/Early Caddo in age (Scallorn and Alba types) to Late Caddo forms (Perdiz and Bassett). Shafer and Green (2008) also document a range of Late Paleoindian to Archaic projectile points in this same area.

A 70 mm long beveled knive of a non-local gray chert was one of the grave goods found with one of the Caddo burials at the Tuinier Farm site (see Figure 38a, bottom). It was found in direct association with a plain elbow pipe. Beveled knives have been found in other Titus phase mortuary contexts (Perttula 2005:287 and Figure 6-41).

In the 2007 investigations, from hand excavations and surface collections, we recovered 51 pieces of lithic debris and seven tools, both chipped and ground. The chipped stone tools (n=5) include chert and quartzite biface fragments from a general surface context, as well as two expedient flake tools and a side scraper from the southern midden units. One of the expedient flake tools and the side scraper are made on flakes of local quartzite, while the other flake tool is on a non-local gray novaculite flake. The ground stone tools are a ferruginous sandstone abrader (Unit 3 in the southern midden) and a greenstone celt fragment (general site collections).

The lithic debris from Tuinier Farm is dominated by quartzite (n=38, 74.5%) from local gravel sources, mainly heat-treated to improve its knappability (cf. Shafer and Green 2008). Petrified wood is another local raw material that was knapped to make chipped stone tools: this material comprises 13.7% of the lithic debris. The remaining pieces of lithic debris produced during the manufacture of chipped stone tools include a light gray chert (n=2, 3.9%), brown chert (n=1, 2%), and a grayish-brown

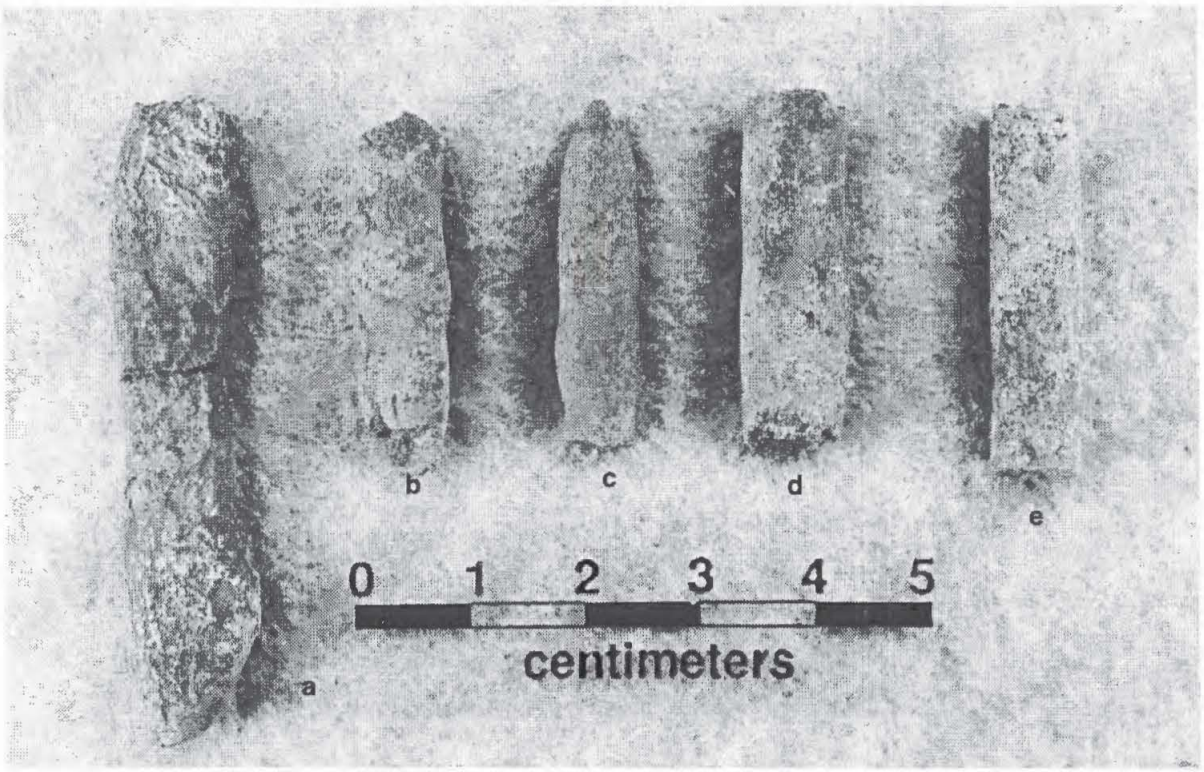

Figure 52. Clay coils from the Anglin site midden excavations.

chert (n=1, 2%), as well as a piece of quartz. All these materials may be available in local stream gravels, but likely not in large quantities or as more than small pebbles. Finally, there is a piece of debris from the resharpening of a celt.

R. A. Watkins

Only a handful of lithic debris from chipped stone tool manufacture is in the site artifact collections. These includes pieces of quartzite (n=5) and dark grayish-brown chert (n=1) pieces.

Anglin

Previous excavations in the midden deposits at the Anglin site have recovered a number of Maud and Talco arrow points (Figure 55). Most of these appear to have been made from the local coarse-grained and heat-treated quartzite.

In our 2007 investigations, we recovered 118 pieces of lithic debris and two core fragments. One of the core fragments was on a heat-treated quartzite pebble (ST B, 20-40 cm bs), while the other (Unit 1, 10-20 cm) is on gray chert. Both core fragments have a smooth cortical surface, indicating the raw material was collected from stream gravels.

The lithic debris is overwhelmingly dominated by flakes from local lithic raw materials, including quartzite (n=96, 81.4%) and petrified wood (n=16, 13.6%). The remaining pieces of lithic debris are black chert (n=1, 0.8%), yellow chert (n=1, 0.8%), gray novaculite (n=3, 2.5%), and claystone/siltstone (n=1, 0.8%). With the exception of the yellow chert, which can likely be found in low quantities in local stream gravel pebbles, the black chert (Big Fork chert), novaculite, and claystone/siltstone are non-local lithic raw materials gathered from gravel sources no closer than the Red River, about 110 km to the northeast. From this lithic raw material data—incomplete though it may be—the use of non-local lithic raw materials during the Titus phase occupation of the Anglin site was minimal. These Caddo apparently did not have much in the way of a dependable access to higher-quality lithics and had to rely on difficult to knap quartzite and petrified wood materials.

About 70% of the quartzite lithic debris from the Anglin site came from previously heat-treated pebbles. About 38% of the quartzite pieces are cortical, with a stream-rolled surface, indicative of the earlier stages of lithic pebble reduction.

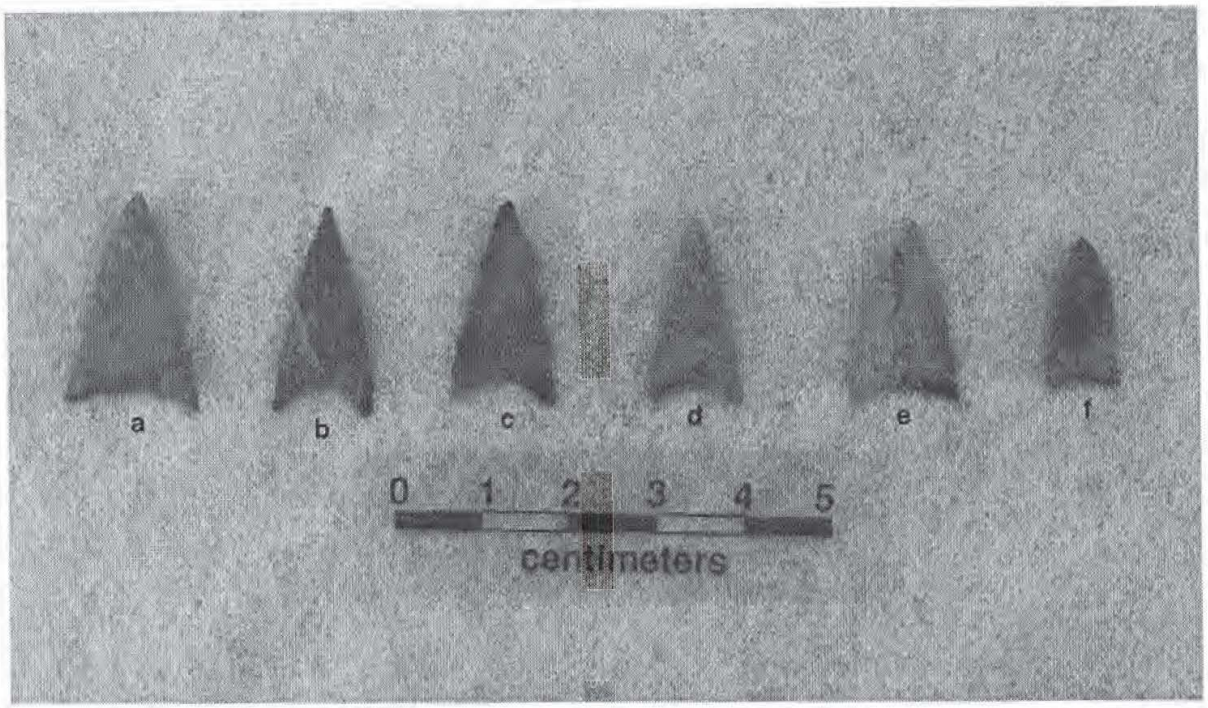

Figure 53. Arrow points from Tuinier Farm midden deposits: b-d, f, Talco; a, e, Maud.

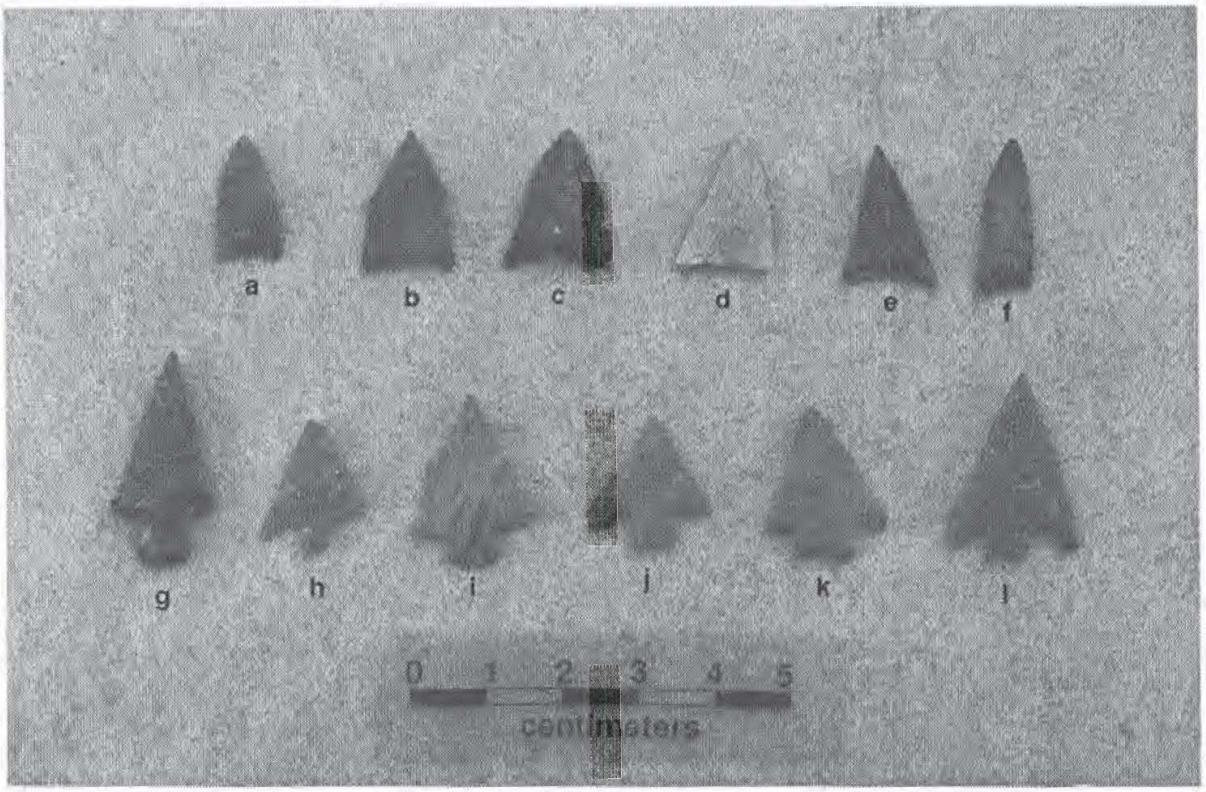

Figure 54. Arrow points from the borrow pit area at the Tuinier Farm site: a-f, Maud and Talco; g, Scallorn; h, Perdiz; i-k, Alba; l, possible Bassett.

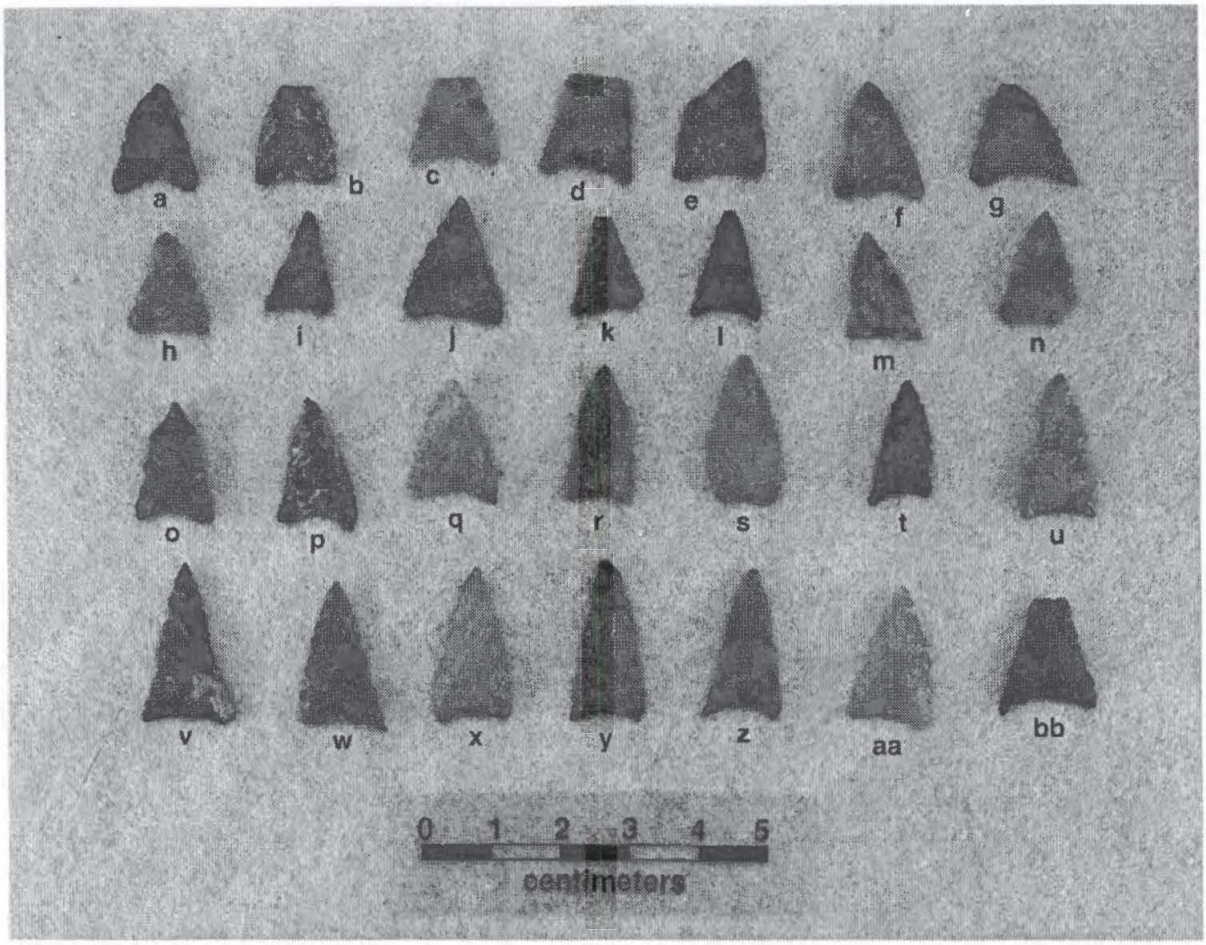

Figure 55. Triangular arrow point forms from the Anglin site midden excavations.

MARINE SHELL ARTIFACTS

Timothy K. Perttula and Lee Green

A single Clements-style marine shell disk (Perttula and Green 2006:22), probably used as an ear disk, is in the collections from the Anglin midden (Figure 56a-b). This particular disk is 22 mm in diameter, 3.5 mm thick, and has a central dot and a single engraved circle that is 16 mm in diameter. A second and smaller engraved shell disk (Perttula and Green 2006:Figure 3) from Anglin was not available for examination for this article.

Clements-style marine shell disks have been found at two sites in the Stouts Creek valley, both from midden contexts, and at only six other Caddo sites in the Ouachita, Red, and the Big Cypress stream basins in Northeast Texas, Northwest Louisiana, and Southwest Arkansas. Ceramic vessels found in burials at these other six sites indicate that the Caddo occupations there took place from ca. A.D. 1650-1700 (Perttula and Green 2006:23). The occurrence of Clements-style marine shell disks at the Anglin site clearly suggests some Caddo use of the site during the latter part of the Titus phase.

ANALYSIS OF THE MOLLUSCA FROM SITES 41HP237, 41HP238, AND 41HP240, HOPKINS COUNTY, TEXAS

Jesse Todd

Mollusca, both terrestrial gastropods and freshwater bivalves, were submitted to MA Consulting from Tuinier Farm (41HP237), R. A. Watkins (41HP238), and Anglin (41HP240) for analysis by Archeological & Environmental Consultants, LLC (Table 20). The following is the results of the analysis.

Only two gastropods were submitted from the collections, both from the Anglin site. One was a

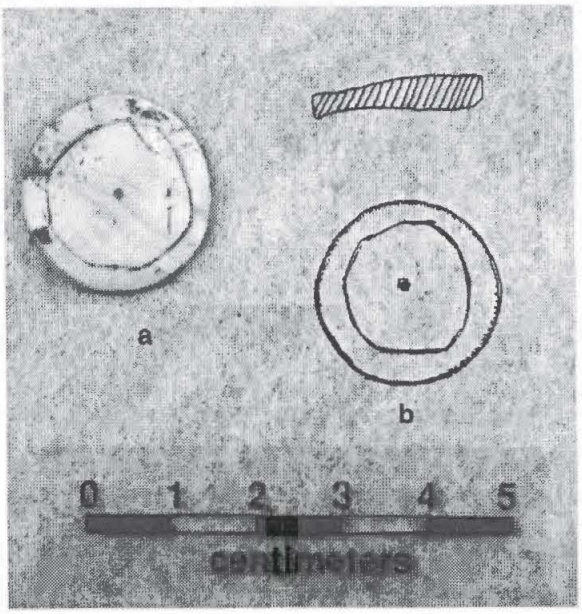

Figure 56. Marine shell disk from the Anglin site midden excavations: a, photograph; b, drawing by LeeAnna Schniebs.

Rabdotus dealbatus, which can be found in floodplain forests or in prairie grasslands. The second is *Mesodon thyroidus*, which indicates the presence of trees.

Twenty-three freshwater mussel valves were identified from the three sites. Normally, the Minimum Number of Individuals (MNI) would be less, but with so few shells, the valves could be compared to one another and no matches were found. The identified valves are *Lampsilis hydiana* (12, 52.2%), *Leptodea fragilis* (6, 26.1%), *Uniomerus declivis* (3, 13%), *Truncilla truncata* (1, 4.4%) and *Quadrula pustulosa* (1, 4.4%). Of the valves, one *L. fragilis* valve was recovered from Tuinier, one *U. declivis* valve was from the R. A. Watkins site, and the rest are from the Anglin site. The greatest number of valves (n=12) and the widest variety of species (n=5) were recovered from Unit 4 at Anglin. The unit was dominated by *Lampsilis hydiana* with seven valves.

Uniomerus declivis can stand dewatering, but based upon the presence of the other mussel species, it is unlikely the stream was dry. The rest of the mussels are such generalists that no other environmental information can be discerned.

Fragments consisting of umbos and shells were abundant and ranged from unburned to heat-treated (gray in color) to burned black. The valve count for *L. fragilis* may be deceiving because of the amount of thin shells present within the fragments. The shells appear to break along the lateral tooth. At least one freshwater mussel, either *Potamilus purpuratus* or *Amblema plicata*, is present based upon a few very thick shell fragments, but no identifiable umbo of these species could be found.

Based upon the range of sizes of the *L. hydiana* and *U. declivis*, the site inhabitants were not selective in their choice of species but were taking whatever freshwater mussels were present. It does not look as if freshwater mussels were a major part of the diet and probably were exploited at one time or very cautiously over time because it takes generally four years for a freshwater mussel species to replenish an area once it has been depleted.

Interestingly, sexual dimorphism could be discerned in the *Lampsilis hydiana* shells. As far as I know, no studies in Texas have been done to determine if the aboriginal inhabitants were selective sexually in their choice of freshwater mussels.

The fish host for *Leptodea fragilis* is the freshwater drum (*Aplodinotus grunniens*) whereas *Quadrula pustulosa* has several hosts, the shovelnose sturgeon (*Scaphirhynchus platorynchus*), black bullhead (*Ameiursu melas*), brown bullhead (*A. nebulosus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*) and white crappie (*Pomoxis annularis*). The sauger (*Stizosdedion canadense*) and the freshwater drum are hosts for *Truncilla truncata* (Howells et al. 1996:76, 122, 146)

Table 20. Description of Mussel Shell by Site and Unit from the Stouts Creek sites.

Tuinier Farm or Caddo Hill site (41HP237)	
South Midden, Unit 1, 10-20 cm bs:	
	shell and umbo fragments, some heat-treated *Leptodea fragilis*, left valve, 5% of valve present
R. A. Watkins site (41HP238)	
The midden	shell fragments, some burned black and others heat-treated
	Uniomerus declivis, left valve, 85% present
Anglin site (41HP240)	
Surface	shell and umbo fragments
Unit 2*	mussel shell fragments
Unit 4	mussel shell and umbo fragments, some heat-treated
	one thick shell fragment
	Leptodea fragilis, 10% of valve present
	Truncilla truncata, left valve, 33.3 mm long, 27.2 mm high
	Quadrula pustulosa, left valve, 38.1 mm long, 33.0 mm high
	Lampsilis hydiana, left valve, 80% present, 29.4 mm long
	L. hydiana, left valve, 90% present, 56.0 mm long, 35.8 mm high
	L. hydiana, right valve, 100% present, 42.9 mm long, 25.6 mm high
	L. hydiana, right valve, 100% present, 31.3 mm long, 20.0 mm high
	L. hydiana, left valve, 45% present
	L. hydiana, left valve, 30% present
	L. hydiana, 10% of valve present
	Uniomerus declivis, left valve, 100% present, 82.7 mm long, 45.8 mm high
	U. declivis, right valve, 100% present, 50.4 mm long, 26.0 mm high
Unit 5	shell and umbo fragments, some heat-treated, some burned black
Unit 6	shell fragments
	Lampsilis hydiana, left and right valve, 15% present each
Unit 7	umbo and shell fragments
	Leptodea fragilis, left valve, 30% present
Unit 8 (?)	shell fragments, some burned black
Unit 9	mussel shell fragments heat treated, some heat-treated
	Lampsilis hydiana, 25% of valve present
Unit 14	*Leptodea fragilis*, 25% of valve present
	Lampsilis hydiana, 15% of valve present
Unit 16	shell fragments
	Leptodea fragilis, left valve, 10% present
	L. fragilis, left valve, 15% present
Unit 18	shell and umbo fragments, some heat-treated and some burned black
	Lampsilis hydiana, left valve, 15% present
	Uniomerus declivis, left valve, 60% present
Unit 22	shell fragments, some burned black
Unit 23	shell fragments, some burned black
Unit 24	*Leptodea fragilis*, 35% of valve present
Midden	umbo and shell fragments
	Lampsilis hydiana, right valve, 85% present, 34.6 mm high, hole over umbo

*Unit designations for Lee Green excavations.

The published mollusca from Hopkins County are from the Cooper Lake (now Lake Jim Chapman) archaeological excavations. Freshwater mussel species recovered from the sites consist of *Potamilus purpuratus*, *Uniomerus tetralasmus*, *Amblema plicata*, *Lampsilis hydiana*, *Quadrula apiculata*, *Toxolasmus texasensis*, *Potamilus ohioensis*, *Lampsilis teres*, *Megalonaias nervosa*, *Truncilla truncata*, *Lasmgonia* cf. *costata*, *Ligumia* sp. indet., *Lampsilis* sp. indet. and *Leptodea* sp. indet. (Fullington 1994, 1995; Yates 1993; Zimmerman 1999). However, the mussels were recovered from sites along the South Sulphur River and its tributaries whereas the Tuinier Farm, R. A. Watkins, and Anglin sites were found along the spring-fed Stouts Creek and its tributaries, which is mapped as intermittent on the Purley, Texas 7.5' USGS quadrangle. An analogy, however, can be found in Tarrant County along White's Branch, an intermittent drainage within the Fort Worth Prairie. A small mussel shell lens site (41TR132) was found along the drainage just south of where a tributary flows into the branch (Skinner and Whorton 1993). It was postulated that the creek was spring-fed; otherwise, the presence of the shell lens site was more problematic.

FAUNAL ANALYSIS OF THREE LATE CADDO SITES IN HOPKINS COUNTY, TEXAS: TUINIER FARM, ANGLIN MIDDEN, AND THE R. A. WATKINS SITE

LeeAnna Schniebs

Introduction

Archaeological investigations over the last few years by several parties at three 16th to 17th century Caddo sites in Hopkins County, Texas, have yielded a combined total of 1,297 identifiable faunal specimens. Unidentifiable fragments were not recorded. Collections from the surface and in test excavations in the context of a recently plowed field at Tuinier Farm (41HP237) resulted in the retrieval of 337 bones. Nine hundred twenty seven pieces came from the Anglin Midden (41HP240), located in a lightly wooded area adjacent to a fence row next to another plowed field. Thirty-three fragments were found on the surface of the R. A. Watkins site (41HP238), a smaller third midden in the same area. The assemblage from each site is well preserved, and taxonomic recovery is diverse. All classes of vertebrates are represented, but mammals are clearly dominant. A complete inventory of the faunal remains is in Appendix 2.

Methods

Standard zooarchaeological techniques have been used. Attributes of the identifiable pieces consist of taxon, element and portion of that element, anatomical location of the element, any notes on age, burning, and presence of modification if applicable. Provenience information was recorded when available, but most specimens (at least from Tuinier Farm) were surface collected. The prehistoric vertebrate remains were inventoried using Excel 5.0 to manipulate the generated data. Weights of specimens and burning were recorded, but are only provided as documentation for future reference. Identifications were made to the most specific category possible depending on the condition of the bone and available comparative skeletal material. Only positive identifications resulted in the assignment of elements to genus or species. Bonnie Yates at the U. S. Fish and Wildlife Forensic Lab in Ashland, Oregon, confirmed the identification of several specimens when comparative material was unavailable or osteological references were inadequate.

Quantification of the assemblage from these three sites is summarized as number of identified specimens per taxon (NISP) and as minimum number of individuals (MNI) for identified elements from each site (Table 21). The MNI method was chosen as the most suitable analytical measure of abundance. "It involves no hypotheses and is purely factual. The minimum number of animals that the bones could have come from is an indisputable fact" (Chaplin 1971:69-70).

MNI estimates were calculated according to the most frequently occurring element, based on symmetry and element portion (Munzel 1986). In the mammalian class, teeth are usually used whenever possible (teeth still retained in socket were counted but not weighed). However, post-cranial elements were often used in this collection. In some cases, the presence of a single element constituted an MNI of one.

Results

The sites are located on the extreme eastern edge of the Post oak Savanna, and the western edge

of the Pineywoods, on Stouts Creek, about 15 km south of White Oak Creek, a large tributary of the Sulphur River. This area includes a wide variety of habitats exploited by the Caddo. The following section discusses the animals recovered from each of the sites and their preferred habitat (Table 22). Burned specimens are listed in Table 23.

Fishes

Found in a borrow pit area at the Tuinier Farm site, gar (*Lepisosteus* sp.) is represented by one scale. Gars are cigar-shaped predatory fish with thick diamond-shaped scales and beak-like jaws with sharp pointed teeth. They are known to

Table 21. Taxonomic composition of faunal remains from the Tuinier Farm, R. A. Watkins, and Anglin sites.

Site	Scientific Name	Common Name	NISP	MNI	Wt./g
41HP237 (Tuinier Site)					
	Vertebrata (indeterminate)	unidentifiable	1		0.6
	Osteichthyes	fish	2		0.05
	Lepisosteus sp.	gar	1	1	0.4
	Rana catesbiana	bullfrog	2	1	1.1
	Testudinata	turtle	48		34.9
	Terrapene sp.	box turtle	46	4	58.3
	Meleagris gallopavo	turkey	21	2	121.1
	Passeriformes (very small)	very sm. perching bird	1	1	0.05
	Didelphis virginiana	opossum	2	1	2.1
	Leporidae	unid. rabbit	1		0.1
	Sylvilagus floridanus	cottontail	7	1	2.2
	Lepus/Sylvilagus sp.	jack or swamp rabbit	1	1	0.9
	Sciurus sp.	squirrel	8	2	1.6
	Procyon lotor	raccoon	6	1	8.7
	Canidae	dog	57	3	205.1
	Odocoileus virginianus	deer	132	4	1302.7
	Bison bison	bison	1	1	2.2
		TOTAL	337	23	1742.1
41HP238 (Watkins Site)			NISP	MNI	Wt./g
	Ictalurus sp.	catfish	1	1	0.7
	Terrapene sp.	box turtle	1	1	1.1
	Meleagris gallopavo	turkey	2	1	0.7
	Dasypus novemcinctus	armadillo	7	1	2.7
	Sylvilagus floridanus	cottontail	1	1	1.3
	Canidae	dog	4	1	3.1
	Odocoileus virginianus	deer	16	2	97.7
	Bison bison	bison	1	1	3.4
		TOTAL	33	9	110.7
41HP240 (Anglin Site)			NISP	MNI	Wt./g
	Vertebrata (indeterminate)	unidentifiable	2		1.4
	Osteichthyes	fish	2	1	1.6
	Ictalurus sp.	catfish	3	1	3.2

Table 21. *(Continued)*

Site	Scientific Name	Common Name	NISP	MNI	Wt./g
41HP240 *(Continued)*					
	Aplodinotus grunniens	freshwater drum	2	2	3.5
	Testudinata	turtle	72		33.3
	Kinosternidae	musk or mud turtle	1	1	0.9
	Pseudemys sp.	pond turtle	1	1	0.3
	Terrapene sp.	box turtle	112	6	117.7
	Trionyx sp.	softshell	2	1	1.9
	Serpentes	lg. unid snake	8		8.6
	Viperidae	lg. poisonous snake	1	1	1.3
	Meleagris gallopavo	turkey	42	2	132.5
	Mammalia (large)	lg. mammal	5		6.3
	Didelphis virginiana	opossum	3	1	3.4
	Dasypus novemcinctus	armadillo	5	1	18.5
	Leporidae	unid. rabbit	8		2.25
	Sylvilagus floridanus	cottontail	36	3	16.35
	Lepus/Sylvilagus sp.	jack or swamp rabbit	36	2	25.6
	Sciurus sp.	squirrel	9	1	3
	Geomys sp.	pocket gopher	29	4	6.25
	Procyon lotor	raccoon	16	2	22.8
	Canidae	dog	208	5	400.2
	Felis concolor	cougar	3	1	73.2
	Sus scrofa	pig	1	1	2.2
	Odocoileus virginianus	deer	304	3	1251.9
	Bison bison	bison	16	1	354.4
		TOTAL	927	41	2492.55

frequent large streams, rivers, and shallow, weedy lakes, where they spawn in spring. They can use atmospheric oxygen and may bask on the surface of the water (Collins 1959). There are three species of gar in this part of Northeast Texas: longnose gar (*L. osseus*), alligator gar (*L. spatula*), and shortnose gar (*L. platostomus*). Specific identification was not possible based on a single scale, although the size of the specimen indicates a medium-size individual.

Catfish (*Ictalurus* sp.) is represented by four specimens from two sites. A vertebral spinous process fragment was found on the surface of the Watkins site. Two units and a surface collection at the Anglin Midden yielded three vertebral elements, and the specimen from Unit 4 is from a very large individual. Catfish are widely distributed throughout the region in various types of bodies of water, while the channel catfish (*I. punctatus*) prefers large waters.

Two otoliths from freshwater drum (*Aplodinotus grunniens*) were recovered from the Anglin Midden. Based on the measurements of these specimens (Witt 1960), one individual was 317 mm long, weighing approximately 400 g. The other fish was much larger, at 647 m long, and weighed approximately 4,440 g. These large fish would have provided several pounds of meat. The preferred habitat of the freshwater drum includes lake shallows and large rivers, and it produces a grunting sound that is audible (Collins 1959).

Four unidentifiable fish remains are also included in the collections. A flotation sample taken in a 40 x 40 cm unit (Unit 4, 10-20 cm bs) at the Tuinier Farm had two very small unidentifiable fragments from a minnow-sized fish. A vertebra from a medium-size fish came from Unit 21, and a second vertebra from a very large fish was found during general collection at the Anglin site. The second

Table 22. Preferred habitat of the animals recovered from the Tuinier Farm, R. A. Watkins, and Anglin sites.

Scientific Name	Common Name	Habitat
Osteichthyes	fish	aquatic
Lepisosteus sp.	gar	aquatic
Ictalurus sp.	catfish	aquatic
Aplodinotus grunniens	freshwater drum	aquatic
Rana catesbiana	bullfrog	aquatic
Kinosternidae	musk or mud turtle	aquatic
Pseudemys sp.	pond turtle	aquatic
Terrapene sp.	box turtle	woodlands and bottomlands
Trionyx sp.	softshell	aquatic
Viperidae	lg. poisonous snake	various
Meleagris gallopavo	turkey	wooded edges
Didelphis virginiana	opossum	woodlands
Dasypus novemcinctus	armadillo	various
Sylvilagus floridanus	cottontail	wooded edges
Lepus/Sylvilagus sp.	jack or swamp rabbit	jack=grasslands, swamp=bottomlands
Sciurus sp.	squirrel	woodlands and bottomlands
Geomys sp.	pocket gopher	sandy soils
Procyon lotor	raccoon	woodlands and bottomlands
Canidae	dog	various
Felis concolor	cougar	various
Sus scrofa	pig	various
Odocoileus virginianus	deer	wooded edges
Bison bison	bison	grasslands

Table 23. Burned faunal specimens from the Tuinier Farm, R. A. Watkins, and Anglin sites.

Site	Scientific Name	Common Name	Not Burned	Burned
41HP237 (Tuinier Site)				
	Vertebrata (indeterminate)	unidentifiable		1
	Osteichthyes	fish	2	
	Lepisosteus sp.	gar	1	
	Rana catesbiana	bullfrog	2	
	Testudinata	turtle	26	22
	Terrapene sp.	box turtle	31	15
	Meleagris gallopavo	turkey	21	
	Passeriformes (very small)	very sm. perching bird	1	
	Didelphis virginiana	opossum	2	
	Leporidae	unid. rabbit	1	
	Sylvilagus floridanus	cottontail	6	1
	Lepus/Sylvilagus sp.	jack or swamp rabbit	1	
	Sciurus sp.	squirrel	8	
	Procyon lotor	raccoon	4	2

Table 23. *(Continued)*

Site	Scientific Name	Common Name	Not Burned	Burned
41HP237 *(Continued)*				
	Canidae	dog	57	
	Odocoileus virginianus	deer	119	13
	Bison bison	bison	1	
		TOTAL	283	54
41HP238 (Watkins Site)				
	Ictalurus sp.	catfish	1	
	Terrapene sp.	box turtle	1	
	Meleagris gallopavo	turkey	1	1
	Dasypus novemcinctus	armadillo	7	
	Sylvilagus floridanus	cottontail	1	
	Canidae	dog	4	
	Odocoileus virginianus	deer	10	6
	Bison bison	bison	1	
		TOTAL	26	7
41HP240 (Anglin Site)				
	Vertebrata (indeterminate)	unidentifiable	2	
	Osteichthyes	fish	2	
	Ictalurus sp.	catfish	3	
	Aplodinotus grunniens	freshwater drum	2	
	Testudinata	turtle	49	23
	Kinosternidae	musk or mud turtle	1	
	Pseudemys sp.	pond turtle	1	
	Terrapene sp.	box turtle	77	35
	Trionyx sp.	softshell	1	1
	Serpentes	lg. unid snake	8	
	Viperidae	lg. poisonous snake	1	
	Meleagris gallopavo	turkey	35	7
	Mammalia (large)	lg. mammal	3	2
	Didelphis virginiana	opossum	3	
	Dasypus novemcinctus	armadillo	5	
	Leporidae	unid. rabbit	7	1
	Sylvilagus floridanus	cottontail	30	6
	Lepus/Sylvilagus sp.	jack or swamp rabbit	26	10
	Sciurus sp.	squirrel	8	1
	Geomys sp.	pocket gopher	29	
	Procyon lotor	raccoon	15	1
	Canidae	dog	206	2
	Felis concolor	cougar	3	
	Sus scrofa	pig	1	
	Odocoileus virginianus	deer	175	129
	Bison bison	bison	14	2
		TOTAL	707	220

specimen has been drilled slightly off-center, and the edges are smoothed from use-wear, possibly as an ornament.

Amphibians

The only amphibian identified in the collection, bullfrog (*Rana catesbiana*) is represented by two pelvic elements. They were recovered from Unit 3, 10-20 cm bs, at Tuinier Farm. The largest of all frogs, it prefers larger bodies of water, residing in lakes, ponds, bogs, and sluggish streams, hiding in vegetated areas (Conant 1975).

Reptiles

Only one plastron fragment from musk or mud turtle (Kinosternidae) was identified, and this is from Unit 23 at the Anglin Midden. The musk turtle is commonly called "stinkpot" because of the glands that secrete an offensive odor as a defense mechanism. "Bottom crawler" is another common description, as they are strongly aquatic turtles generally preferring slow-moving or shallow waters with soft bottoms and abundant vegetation (Behler 1995). Distinction between the two is difficult based on a single element, as there are two genera north of Mexico: *Sternotherus*, with four species of musk turtles, and *Kinosternon*, with five species of mud turtles. Currently, the mud turtle (*K. subrubrum*), the musk turtle (*S. carinatus*), and the stinkpot (*S. odoratus*) occupy this part of Northeast Texas.

One pelvic element from a large pond turtle (*Pseudemys* sp.) was found at the Anglin Midden. They are part of a large group of turtles (including sliders and cooters) that range from coast to coast, preferring areas where the water is shallow, the aquatic vegetation profuse, and the bottom soft and muddy: in ponds, marshes, ditches, edges of lakes, backwaters of streams, and in prairie sloughs, cattle tanks, and river pools (Conant 1975).

Box turtle (*Terrapene* sp.) is represented at all three sites, with a combined total of 159 specimens. Four units, one shovel test, and surface collections at Tuinier Farm yielded 46 shell fragments, with a site MNI of four based on hyoplastron elements. One pelvic element and 111 shell fragments came from 17 units at the Anglin Midden, and the site MNI is six (also based on hyoplastron pieces). One nuchal element was found on the surface of the Watkins site.

Two shell fragments from softshell turtle (*Trionyx* sp.) were recovered from units 7 and 18 at Anglin. Two species occupy the area: the smooth softshell (*T. muticus*) and the spiny softshell (*T. spiniferus*). Specific subspecies in Northeast Texas are the Midland Softshell (*T. m. muticus*) and the Pallid Softshell (*T. s. pallidus*). All species are aquatic, and the preferred habitat includes small marshy creeks, farm ponds, and large, fast-flowing rivers and lakes (Behler 1995). They are powerful swimmers, and they can run on land with startling speed and agility (Conant 1975). The carapace is circular, and covered with soft, leathery skin instead of horny scutes. They have long necks, strong jaws, and sharp beaks.

High quantities of indeterminate turtle were also recorded. One toe bone and 45 shell fragments were found at Tuinier Farm, recovered from three shovel tests and three excavation units (including fine screen and flotation samples taken in Unit 4). The Anglin Midden yielded 74 shell fragments from 15 units and general collections. Based on specimen size, most of these pieces are from terrapins or musk/mud turtles. The exceptions include the toe bone and one shell fragment from Tuinier Farm, and two pieces of shell from Anglin: they are from very large individuals (see Appendix 2). These three shell fragments are notable, as they are very water-worn, unlike other pieces in the assemblage. They could only be the remains of snapping turtle (*Chelydra* sp.) or pond turtle, as they are the only turtles in this size range.

The Anglin site had the only snake bones in the collection, comprised of nine large vertebrae. This includes one poisonous snake (Viperidae) from Unit 18, indicated by the long spur protruding vertically from the centrum. The other eight elements were recovered from five units and general collections. Unfortunately, absence of diagnostic attributes, specifically the centrum spur, prevented specific identification. However, they are all similar in size and may be the remains of a single individual. There are four species of poisonous snakes in Northeast Texas: rattlesnakes, copperheads, cottonmouth/water moccasins, and coral snakes.

Birds

All three sites had the remains of turkey (*Meleagris gallopavo*). At Tuinier Farm, four pieces came from three units (including two fragments from a flotation sample taken in Unit 4), and 17 bones were retrieved during general site surface collections. A minimum of two individuals were present at this site, based on distal ends of the tarsometatarsus.

Fourteen units and general collections at the Anglin Midden had 42 specimens. Based on proximal ends of the tibiotarsus, this site also has an MNI of two. Two turkey bones were found on the surface of the Watkins site, with a site MNI of one. Turkey occurs as wild fowl in open woodland environments (Robbins 1983), and its presence indicates exploitation of the grassy areas along the edges of the woods.

Tuinier Farm had one tiny specimen from a very small perching bird (Passeriformes). This distal tibiotarsus fragment was recovered from a flotation sample taken in Unit 4 (10-20 cm bs).

Mammals

Opossum (*Didelphis virginiana*) is represented by five specimens at two sites; both sites have an MNI of one. At Tuinier Farm, a vertebra was recovered in Unit 3 (10-20 cm bs), and an upper canine tooth was found during general surface collection. The tooth is drilled through the root area, and is highly polished from use-wear, probably because it was used as an ornament similar to the previously mentioned drilled fish vertebra. Opossum teeth are naturally very sharp, and this piece could have also functioned as a punch-type tool. Unit 17 at the Anglin site contained fragments from a scapula and pelvis, and an ulna fragment came from Unit 20. The opossum is widespread throughout Northeastern Texas, occupying a wide variety of habitats. This includes wooded areas, prairies, and marshes, preferring wetter areas near streams, swamps, creeks, and river bottoms (Schmidly 1983).

Nine-banded armadillo (*Dasypus novemcinctus*) is represented at two sites. Surface collection at the Watkins site had one vertebra, one cranial fragment, and five scutes. At the Anglin Midden, four pelvis fragments were found in general collections, and a humerus fragment came from Unit 18. The specimens are modern intrusives.

Eastern cottontail rabbit (*Sylvilagus floridanus*) is represented at all three sites. Seven specimens were recovered from Unit 1 (0-10 cm and 20-30 cm bs) at Tuinier Farm, including a mandible with four teeth. A femur fragment was found on the surface of the Watkins site. These two sites each have an MNI of one. General site collections and 12 units at the Anglin site yielded 36 specimens. Anglin has a site MNI of three, based on several bones (proximal femur, mandible, and lower second molar). An unfused femur and vertebra indicates that at least one individual is immature. The preferred habitat for the eastern cottontail is brushy areas with grasses and herbs for food and protection from predators; it is found in all vegetated areas of Northeast Texas, occasionally occurring in swamps and woodlands (Schmidly 1983).

Black-tailed jackrabbit or swamp rabbit (*Lepus californicus* or *Sylvilagus aquaticus*) is represented at two sites. One femur shaft fragment was found in Unit 1 (20-30 cm bs) at Tuinier Farm. The Anglin site had 36 specimens from general site collections and 13 units. Based on proximal humerii and upper third premolars, the Anglin site MNI is two. Because these two rabbits are similar in size, distinction between them is difficult, especially based on fragmentary remains. The jackrabbit is rare in the oak-hickory and pine-oak regions of Northeast Texas; the more common swamp rabbit prefers the marshy areas bordering floodplains, woodlands, and grasslands (Schmidly 1983). Based on the location of the sites in the region and their close proximity to water sources, it is likely that most of these bone fragments are the remains of swamp rabbit.

Squirrel (*Sciurus* sp.) was found at two sites. Eight specimens were recovered from two levels in four units at Tuinier Farm, and the site MNI of two is based on scapula fragments. Six units and general collections at Anglin Midden yielded nine bone fragments, with a site MNI of one. In Northeast Texas, gray squirrels (*S. carolinensis*) are rare in the pine woods and upland forests; fox squirrels (*S. niger*) are found in all timbered habitats (Schmidly 1983).

Pocket gopher (*Geomys* sp.) is represented by 29 specimens from six units and general site collections at the Anglin Midden. Based on mandibles, there were a minimum of four gophers in the faunal assemblage, including an immature individual. These are probably the remains of Louisiana pocket gopher (*G. breviceps*). These may be intrusive remains, although during times of stress could have been dietary supplements. Pocket gophers occur in sandy soils with a low clay content.

Raccoon (*Procyon lotor*) remains were recovered from two sites. Five specimens came from two levels in two units at Tuinier Farm, and a finely crafted awl manufactured from a fibula was found during general site collections. The Anglin Midden yielded 16 elements from three units and general collection areas. Site MNI at Tuinier Farm is one, and a minimum of two individuals were at Anglin (based on mandibles and teeth). Raccoons are found in all vegetated regions in Northeast Texas,

including floodplains, bottomlands, and hardwood-timbered habitats (Schmidly 1983). They seldom occur far from water, and do much of their foraging near or in bodies of water (Davis 1978).

Dog (*Canis* sp.) is well represented in the faunal collection. Tuinier Farm had 57 specimens, recovered from one shovel test (0-20 cm bs), three levels in three units (0-30 cm bs), and a general site collection. A minimum of three individuals were present at this site. Three teeth and one foot bone were found on the surface of the Watkins site. Twelve units at the Anglin Midden (including four levels in Unit 24) yielded 208 specimens. Based on the upper first molar, the Anglin Midden has a site MNI of five, and at least two of these dogs are immature. Domestic dogs (*C. familiaris)* are often found in prehistoric contexts. Their only domesticated animal, the Caddos used dogs to hunt buffalo and found them particularly useful for routing out bears, and they were eaten in times of extreme scarcity or possibly on a few ritual occasions (Newcomb 1993); most likely the dog remains are from disturbed burials.

Cougar (*Felis concolor*) is represented by three bones, recovered from the Anglin Midden. Identifications were confirmed by Bonnie Yates of the U.S. Fish and Wildlife Service. Also known as the puma, panther, or mountain lion (although there are no mountains in East Texas), reports of the so-called "black panthers" are common in eastern Texas; they probably occurred throughout the region prior to settlement by Anglo-Americans but have been consistently eliminated over most of the region since the end of the nineteenth century (Schmidly 1983). Deer is the cougar's preferred prey (Davis 1978). One element that compared favorably to cougar was also recovered from the Hurricane Hill site (Yates 1999:346) in the upper Sulphur River basin. Otherwise, bobcat is usually the most common feline found in Northeast Texas faunal assemblages.

One tooth from pig (*Sus scrofa*) was recovered from Unit 7 in the Anglin Midden. Feral hogs have been present in the United States since the first settlers brought them to Florida in 1539, and there is a sizeable population of feral hogs, European wild hogs, and hybrids in Texas; free-ranging hogs occur throughout the timbered country of Northeastern Texas (Schmidly 1983). This element is probably an intrusive faunal specimen.

Whitetail deer (*Odocoileus virginianus*) is the most common large game animal found in Caddo faunal assemblages. Not only are they the main game animal in Caddo diets, but their hides and bones are also utilized as clothing and tools. A total of 452 specimens were recovered from the three sites, ranging in age from about six months to 4 years old. This is based on tooth eruption, tooth wear (Severinghaus 1949), and epiphyseal fusion of post-cranial elements. The Tuinier site has an MNI of four, the Watkins site has an MNI of two, and the Anglin site has an MNI of three. Deer occur in all vegetal regions, but in Northeast Texas they are found in larger numbers in timbered areas (Schmidly 1983).

Bison (*Bison bison*) is represented at all three sites. Sixteen specimens were found at the Anglin Midden, including two drilled incisors and several post-cranial elements. The Watkins and Tuinier sites yielded only one drilled incisor each. These teeth were probably worn as pendants. Bison once ranged over almost the whole of eastern Texas, except for the densely wooded Big Thicket, and were probably numerous in the post oak woodlands, which were covered with woods and open prairies; they became extinct very soon after Anglo-Americans occupied the land (Schmidly 1983).

Modified Bone

Modified bone refers to faunal specimens with evidence of human alteration such as cutting, grinding, or other reshaping, as well as finished bone tools or jewelry. The three sites had 20 modified specimens (Table 24), and the majority came from the Anglin Midden. They have been grouped into four categories, distinguished by assumed function and/or form. The system is based loosely on Kidder's (1932) scheme for bone artifacts from Pecos, New Mexico, and an adaptation of this scheme by Beach and Causey (1984) for Arroyo Hondo, New Mexico. In large modified bone assemblages, the categories are often primarily sorted by anatomical element, animal used, then function.

Type A

This category is comprised of three sharply pointed specimens from the Anglin Midden and one from the Tuinier Farm. A finely crafted awl is manufactured from the proximal end of a deer ulna (Figure 57a), one of the most common elements used for tools of this type. The thin, tapering of the shaft needs little shaping to form the pointed working end, and the ulnar notch provides a perfect

Table 24. Modified faunal specimens from the Tuinier Farm, R. A. Watkins, and Anglin sites.

41HP--	LS Bag No	TU	Depth	Feat	Qty	Taxon	Elem/Por	Side	Age	Burn	Mod	Mod Type	Wt/g	Comments
240	47		surf	midden	1	deer	ulna prox	R		n	awl (sharp)	A	9	hi-polish
237	9		surf	midden	1	raccoon	fib dist	R		n	awl (sharp)	A	1.2	finely crafted
240	2		surf	midden	1	unid	unid			n	awl (sharp)	A	0.4	polish; exped tool?
240	18	7	surf	midden	1	unid	unid			n	awl (sharp)	A	1	
240	25	16	surf	midden	1	deer	ulnar notch	L		n	awl (dull)	B-I	3.3	
240	12		surf	midden	1	lg mam	unid			n	awl (dull)	B-I	2.4	
240	16	5	surf	midden	1	lg mam	unid			n	awl (dull)	B-I	0.8	
240	24	15	surf	midden	1	lg mam	unid			b	blunt	B-II	1.3	poss rib frg
240	37	24	20to30	midden	1	lg mam	unid			b	blunt	B-II	1.5	
240	34	24	30to40	midden	1	lg mam	unid			n	blunt frg	B-II	0.3	
240	17	6	surf	midden	1	bovid	incisor			n	drilled	C	2.5	incomp hole
240	48		surf	midden	1	bovid	incisor lo	L		n	drilled	C	1.6	hi-polish
237	8		surf	midden	1	bovid	incisor lo	R		n	drilled	C	2.2	
238	1		surf	midden	1	bovid	incisor	L		n	drilled	C	3.4	incomp hole
240	46		surf	midden	1	fish	vert	A		n	drilled	C	1.2	lg individual
237	8		surf	midden	1	opossum	C up	R		n	drilled	C	0.8	hi-polish
237	20	3	10to20	midden89	1	unid	l.b.frag			b	r+s	C	0.6	bead debris
240	36	24	10to20	midden	1	deer	antler pedicle			b	tool	D	7.8	pestle?
240	2		surf	midden	1	deer	mand frg	L		n	tool	D	22.7	ground, polished
237	14	1	10to20	S. midden	1	deer	mand t'row	L	3.5or4yrs	n	tool	D	48.8	ground, polished

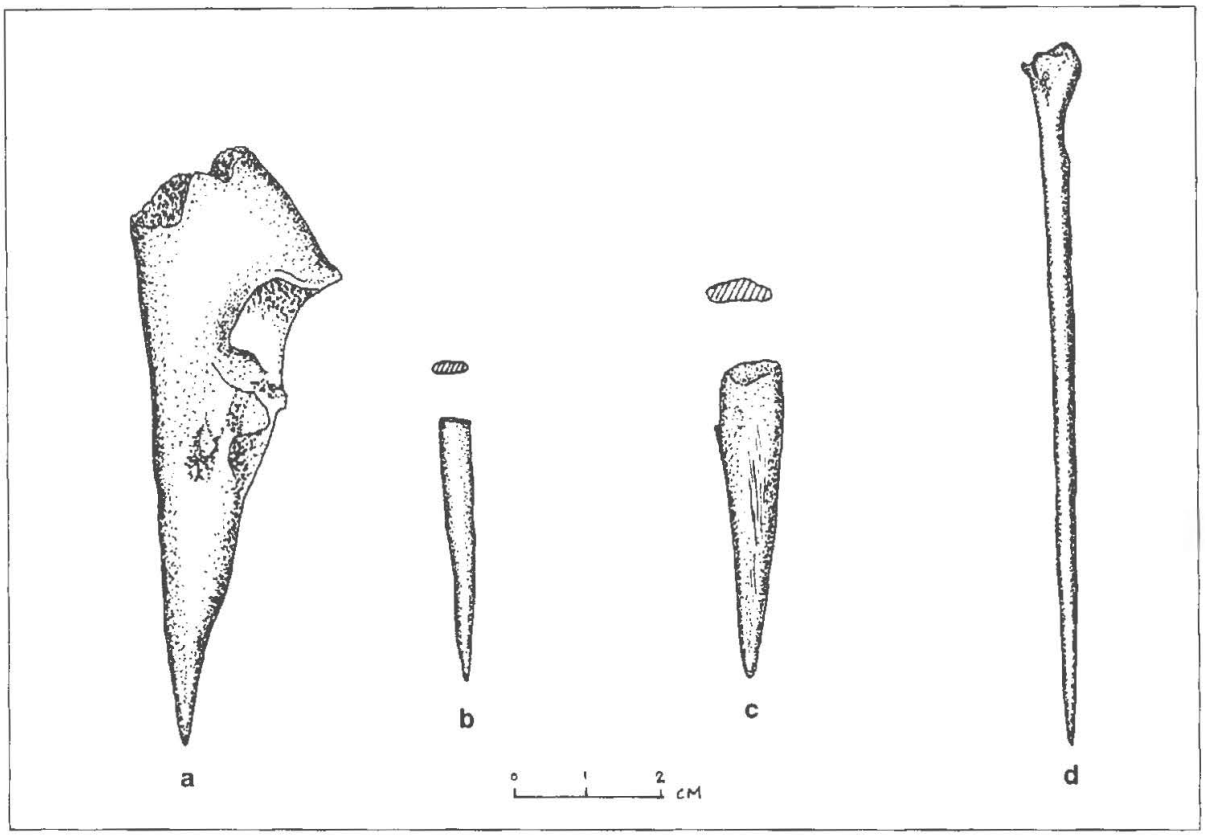

Figure 57. Type A modified bone: a-c, Anglin site; d, Tuinier Farm site.

handle. This piece measures about 8 cm in length, and originally was probably longer but was fractured during use, then resharpened at the broken edge. It is highly polished from use-wear. The second fragment from Anglin is broken at the shaft and measures 3.5 cm in length, with an almost needle-like appearance (Figure 57b). Because diagnostic attributes are absent, determination of animal and element was not possible. It is also very highly polished from use, and may have served as an expedient tool after breakage. The third piece is also broken at the shaft, and resembles the more commonly found awls: flat in cross-section, a wider mid-shaft, and tapering to the point (Figure 57c). Manufactured from an indeterminate element of an unidentifiable large mammal, it measures 4 cm in length and is not polished on the surface. The tool from the Tuinier Farm site is of particular interest, as it is in pristine condition despite its delicacy. Made from a raccoon fibula, it is 9.3 cm long, and is also needle-like in shape (Figure 57d). Perhaps this piece could have been worn as a hair pin as well as functioned as a punch-type tool. Striations from manufacture and use are visible on all four specimens.

Type B

This category includes six bone artifacts with semi-rounded or blunt ends that are not sharply pointed. They were all recovered from the Anglin site. The small deer ulna is broken on the proximal end, just above the finger notch handle, and the distal end is a dull point (Figure 58a). Originally it was probably very similar to the ulna awl described above (see Figure 57a), and served as a punch-type tool. Two similar fragments from unidentifiable large mammal bones are broad and flat in cross-section, broken mid-shaft, and taper into the dull pointed working ends (Figure 58b-c). Also broken at mid-shaft and flat in cross-section are two large mammal bone fragments that have rounded working ends, but are not pointed at all (Figure 58d-e). The final specimen is a broken fragment of unknown function, but remnants of a broad, dull working end are visible (Figure 58f).

Type C

This group is comprised of ornaments or special decorative items. A leg bone from an in-

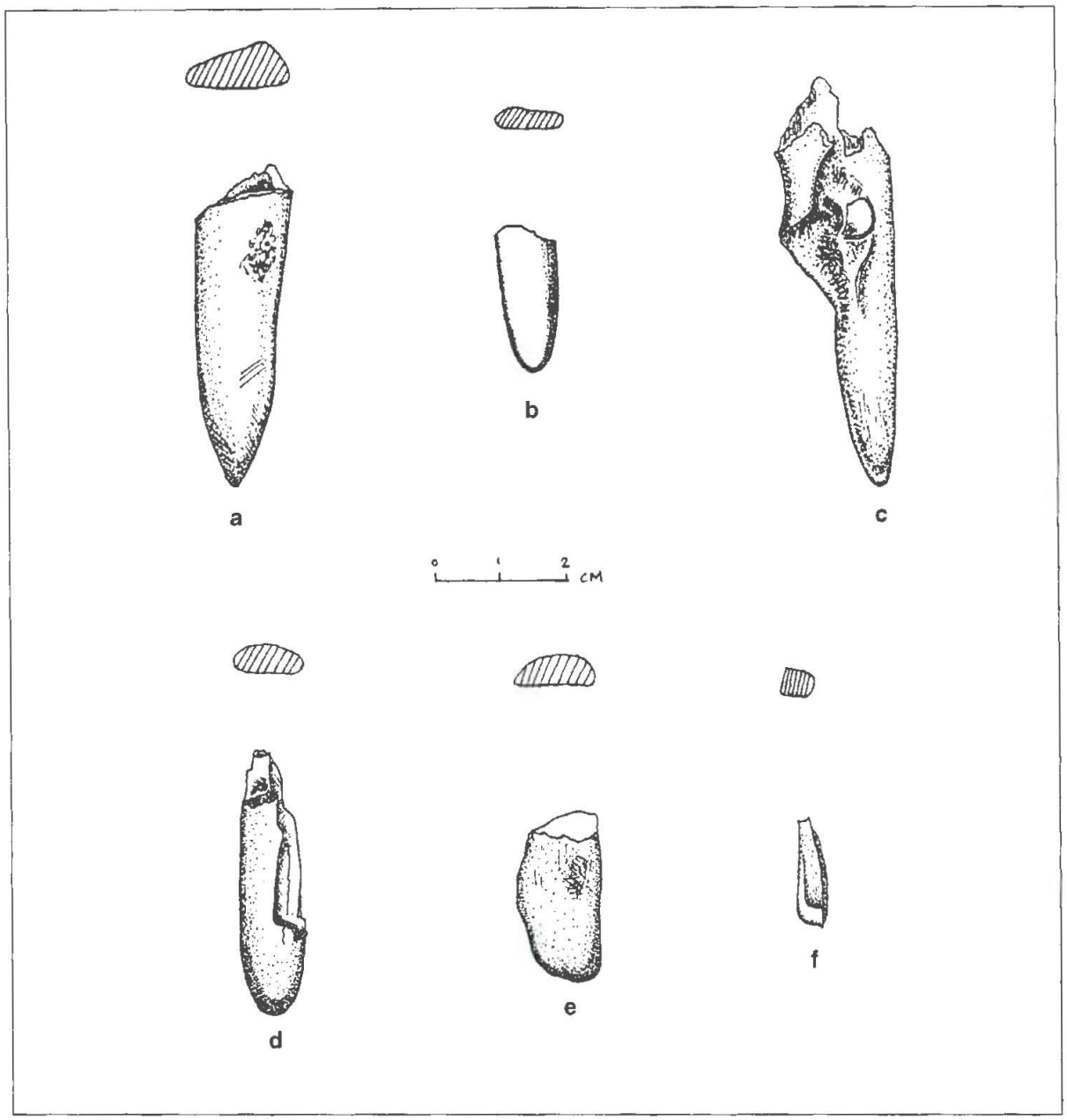

Figure 58. Type B modified bone from the Anglin site midden excavations.

determinate animal (a bird or small mammal) is recorded as bead debris (Figure 59a). Transverse scoring is visible mid-shaft, and the remnants have been snapped off by a ring and snap procedure. The other edge is ragged, and is assumed to be the discarded waste from the creation of a bone tube or bead. It was recovered in Unit 3 (10-20 cm bs) at the Tuinier Farm site.

Two drilled objects also came from the Tuinier Farm site: a bison incisor (see Figure 59b) and an upper canine tooth from an opossum (see Figure 59c). The opossum tooth is very sharp, and could have also served as a punch-type tool as well as an ornament. The R. A. Watkins site yielded a large bison incisor with evidence of intent to drill a hole through the tooth root, but the hole is incomplete and unfinished (see Figure 59d). Two more drilled bison incisors (see Figure 59e-f) were also recovered from the Anglin site, as well as the drilled vertebra from a large unidentifiable fish (see Figure 59g). One of the bison incisors from Anglin is also unfinished, similar to the specimen from the R. A. Watkins site.

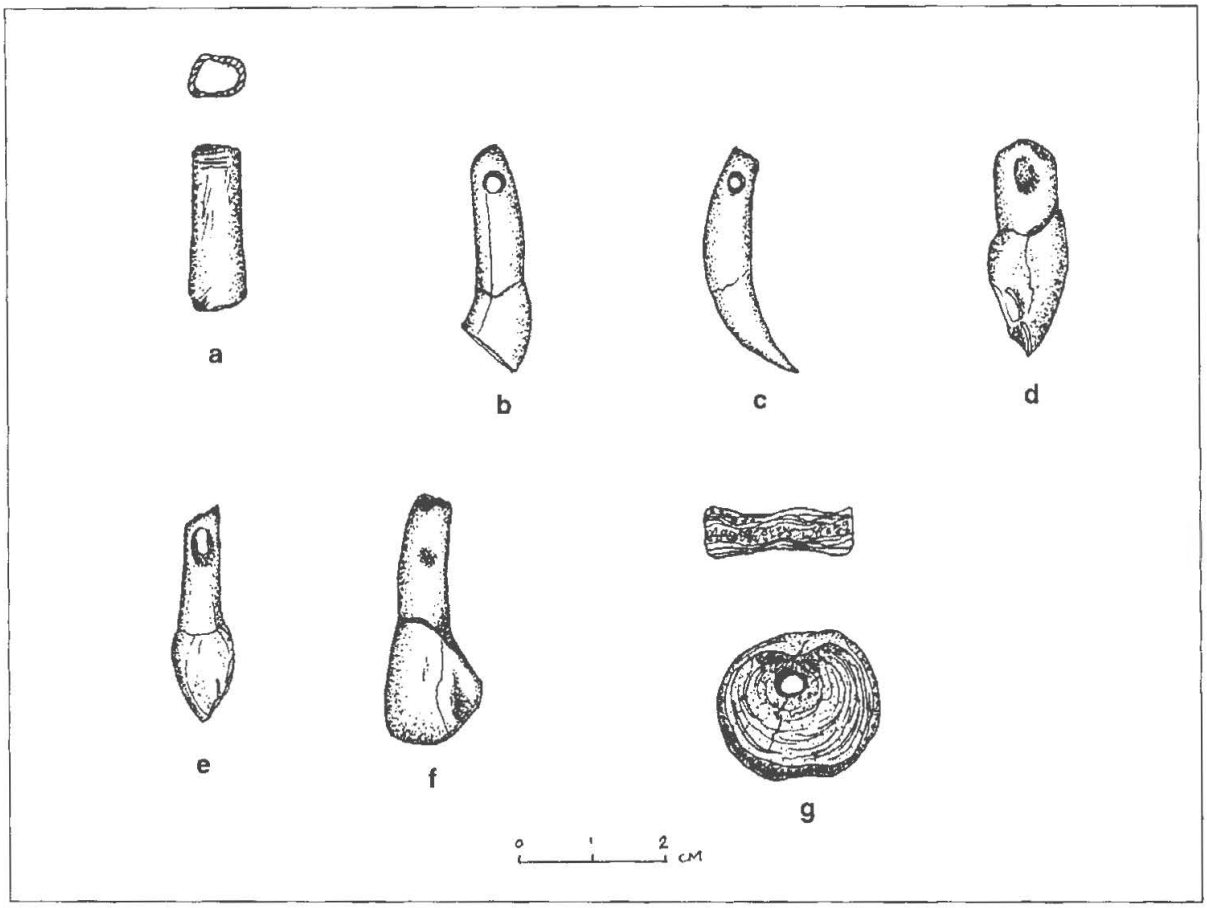

Figure 59. Type C modified bone from the Tuinier Farm, Watkins and Anglin sites: a-c, Tuinier Farm; d, R. A. Watkins; e-g, Anglin site.

Type D

Three items from deer bone comprise this category of modified specimens. An antler pedicle from a small deer was recovered in Unit 24 (10-20 cm) at the Anglin midden site excavations (Figure 60a). The surface of the base has been ground smooth, possibly from use as a pestle. The antler shaft is broken, but would have served well as a comfortably fitting handle. It measures 6 cm in length.

Also from the Anglin site is a modified deer mandible fragment (see Figure 60b). The diastema at the anterior end (the area closer to the incisors) has been removed, then shaped and ground to form a broad working edge, evidence of use as a rubbing or grinding implement. It is highly polished from use, and is 9 cm long. Another modified deer mandible came from Unit 1 (10-20 cm bs) at the Tuinier Farm site (see Figure 60c). It is almost complete, including all but one tooth in socket. The diastema is intact, but the incisor sockets are absent. This is the shaped and ground working edge, much more narrow than the mandible from Anglin. It is assumed that these two implements served the same function, probably as deer jaw sickles (cf. Brown 1964, 1996; Krieger 1946:202 and Plate 23c), but one has been used much more extensively. Both of these mandibles fit comfortably in the hand as does the antler fragment.

Krieger (1946:193) noted that two or three such deer jaw tools were recovered from the midden excavations at the Sanders site (41LR2) on the Red River, along with a fishhook, beamers, shaft wrenches, and awls. Four deer jaw sickles were recovered from burial and non-burial contexts at the Spiro site in eastern Oklahoma (Brown 1996:496). Brown (1996:496) has indicated that deer jaw sickles are found on Caddo and Southern Plains sites in Arkansas, Texas, and Oklahoma.

Summary

Aquatic species are abundant in the faunal remains from the Tuinier Farm, Anglin Midden, and Watkins site, but their contribution to the diet

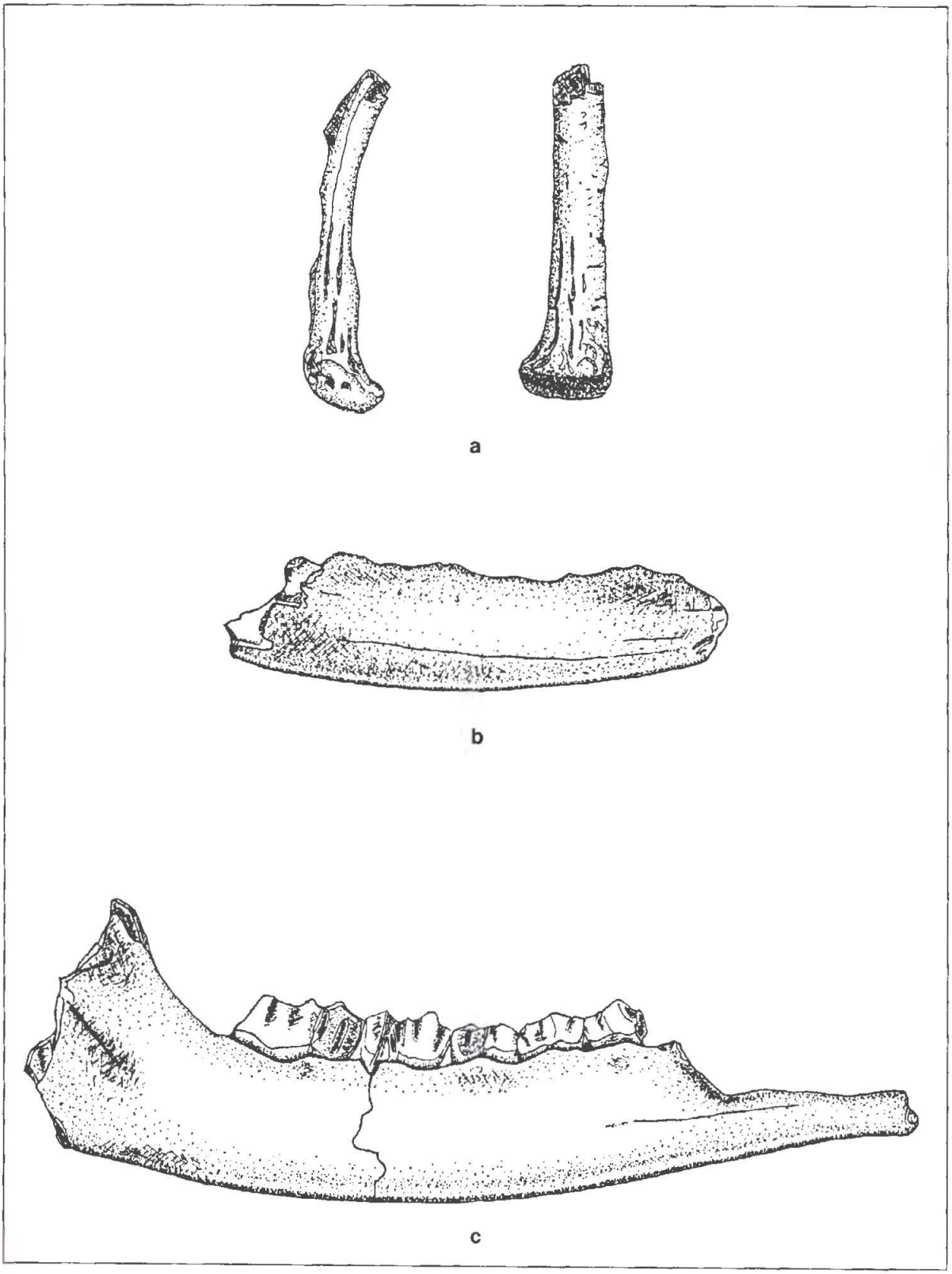

Figure 60. Type D modified bone: a-b, Anglin site; c, Tuinier Farm.

is probably minimal, based on the small size of most of the animals recovered. Wooded edges were hunted for deer, cottontail, and turkey. The remaining animals were found in grasslands, woodlands, and bottomlands.

The faunal assemblage suggests that the sites could have been occupied throughout the year because the animals identified would have been available during all seasons, specifically the fish, turkey, rabbits, and squirrel. The bison was probably obtained as the opportunity presented itself. However, the young deer indicates hunting during the summer or early fall, as offspring are born in the spring. The shed antler pedicle implies a late winter kill. Winter hunting may also be indicated by the presence of the cougar, opossum, and raccoon. Their pelts become especially luxurious and more valued than the rest of the year. Turtles were probably obtained during the warmer seasons.

The recovery of small animals, especially the turtles, suggests the possibility that entire families took part in the procurement of food. These animals could have been obtained by women and children using passive hunting techniques. Men were generally the hunters of deer and the other larger animals, but the deer surely provided the main meat source for the Caddo because of its availability. However, turtle, opossum, rabbit, squirrel, pocket gopher, and raccoon are also important dietary resources.

Previous investigations at other Caddo sites in the area document similar patterns of animal resource utilization and general species composition, such as Hurricane Hill. Environmental areas exploited include aquatic and riparian habitats, forests, and open meadows with wooded edges. The modified bone assemblage at these three Caddo sites provide further evidence of site activities such as plant processing as well as animal procurement and subsequent processing. The ornamental pieces may suggest that ceremonial or ritual endeavors also took place at the sites using animal parts. The canine bones could be the remnants of dog burials, as these are common in Late Caddo sites in this area.

The faunal specimens from the three sites are in very good condition, despite surface exposure and agricultural activities. The information presented in this section provides a representation of broad trends in the subsistence practices of the Late Caddo occupants that lived in the Stouts Creek valley: exploitation of the diverse animal life in the rich ecosystem of Northeast Texas.

SUMMARY AND CONCLUSIONS

The Tuinier Farm (41HP237), R. A. Watkins (41HP238), and Anglin (41HP238) sites are Late Caddo, Titus phase, domestic habitation sites on Stouts Creek in the Post Oak Savannah of northeastern Texas. The three sites were located and first investigated by Lee Green and associates over the last several years, where they identified considerable midden deposits at each site, located three burial features at the Tuinier Farm site, and recovered a substantial associated artifact assemblage (primarily consisting of ceramic vessel sherds from fine wares, utility wares, and plain wares) and an impressive amount of unburned and burned animal food debris. The Anglin and Tuinier Farm sites also have a number of clay objects, including figurines and figurine fragments as well as clay ear spools and disk, plus Clements style marine shell ear disks; these kinds of artifacts are otherwise quite rare in other prehistoric or early historic Caddo archaeological contexts in Northeast Texas and other parts of the Caddo archaeological area.

Principally because of the excellent preservation of the midden deposits at the Stouts Creek sites as well as the character of some of the intriguing artifacts from the Anglin site (i.e., Clements-style marine shell ear disks and an abundance of clay objects, including a large assortment of clay figurines and ear spools) and the Tuinier Farm (i.e., a ca. mid-17th century inverted rim Taylor Engraved vessel), limited shovel testing and hand excavations were conducted at the Anglin and Tuinier Farm sites in February 2007 to evaluate their archaeological character in more detail than had been previously done and also to gather first-hand and controlled archaeological data on the artifact and faunal assemblages. In conjunction with this effort, and with the permission of Lee Green and his associates, we also undertook a detailed examination of the extant collections from these Stouts Creek sites. This was done primarily to better ascertain the likely chronological age and social and cultural affiliations of the Caddo populations that occupied the Stouts Creek sites. That is to say, it was clear that the sites were occupied by what archaeologists call Titus phase Caddo groups (e.g., Perttula 1998, 2004; Thurmond 1990), likely during the latter part of the phase, or during the protohistoric/early historic period (Figure 61), but our intent was to clarify and refine—if possible—the chronological span of the occupations and the direction of cultural contacts

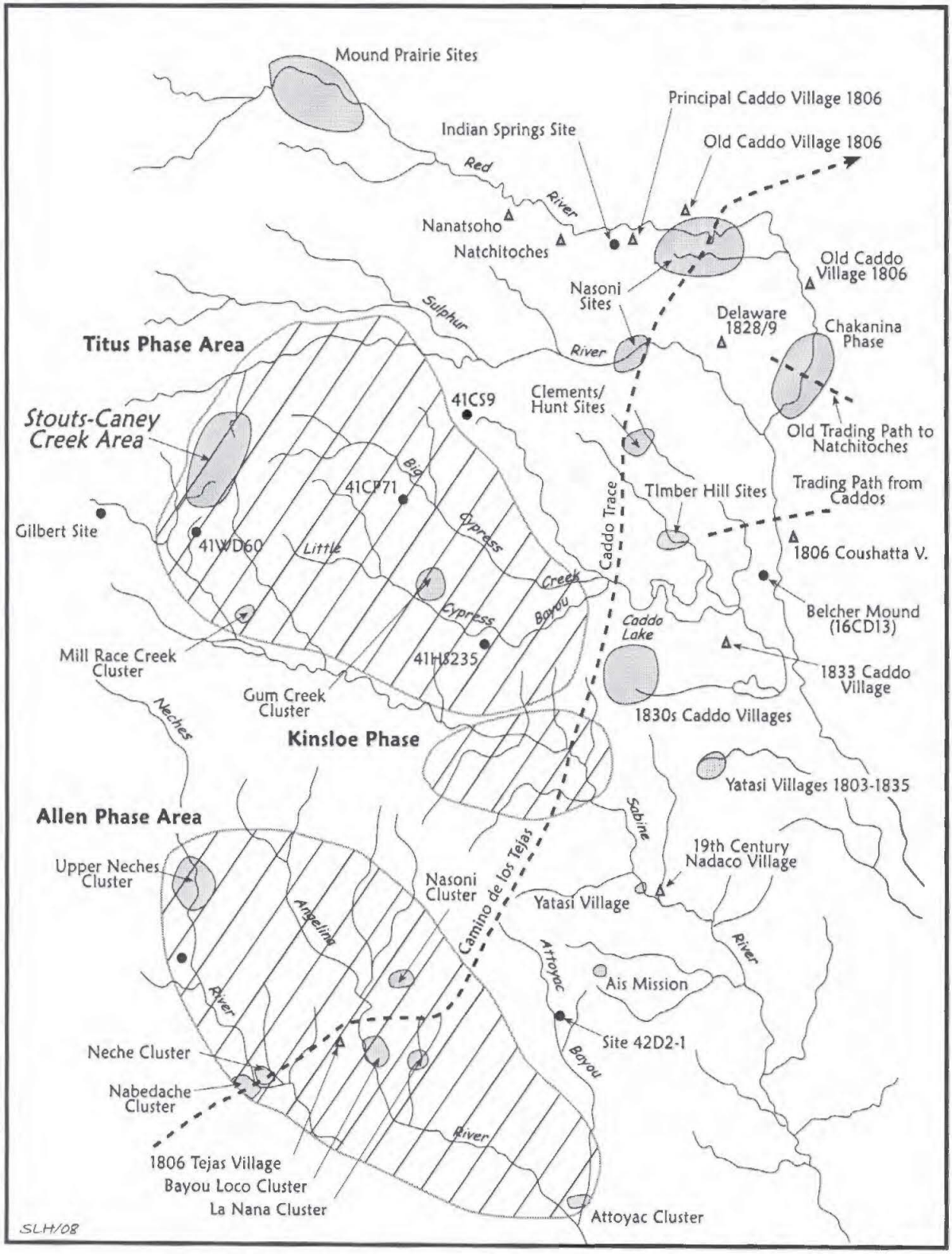

Figure 61. The Stouts/Caney Creek areas in East Texas, showing relevant protohistoric and Historic Caddo sites and archaeological phases, as well as the general location of some villages and trails mentioned in historic documents and maps.

and social interrelationships with other known and contemporaneous Titus phase groups in the Sulphur, Big Cypress, and upper Sabine River basins.

A simple but effective way of determining cultural and ceramic stylistic affiliations between contemporaneous Caddo groups in East Texas and northwestern Louisiana is to make comparisons between ceramic assemblages using a series of general decorative classes (i.e., brushed, ridged, incised, engraved, punctated, appliqued, and red-slipped) (see Kelley 2005:61-66) to "see how much variability occurs in assemblages from nearby regions." Kelley's examination of Belcher and Titus phase sites from different parts of the region, the Burnitt site in the Sabine River uplands in northwestern Louisiana, and sites at Toledo Bend Reservoir along the Sabine River showed "very little variation within each region and significant differences between the regions." Perforce, these similarities and differences in ceramic stylistic attributes and decorative classes lie at the heart of any conclusions about the cultural and ceramic affiliations of local Caddo groups. Determinations of cultural affiliations and close ceramic stylistic ties between different but contemporaneous Caddo sites clearly imply the existence of regular contact, interaction, and the sharing of ideas between Caddo peoples living at those sites.

I employ the same approach here with respect to ascertaining the cultural and ceramic stylistic affiliations of the Stouts Creek sites by utilizing ceramic decorative data (proportions of key utility wares and red-slipped wares, since Ripley Engraved is common at just about all these sites) from contemporaneous Caddo sites (mostly of Titus phase affiliation) in the region and comparing that to the decorative class information from the Anglin and Tuinier Farm sites (Table 25). The sites used in this comparative analysis includes several Titus phase sites in the Dry Creek and Caney Creek localities in the upper Sabine River basin; two substantial ceramic assemblages from Titus phase sites on the middle reaches of Big Cypress Creek, but belonging to the western Titus phase ceramic tradition; the James Owens site (41TT769) on White Oak Creek in the Sulphur River basin (Walters et al. 2003); and the Titus phase Ear Spool site (41TT653) on a tributary stream that flows north into White Oak Creek (Perttula and Sherman 2008).

Not just geographically, the Titus phase ceramic assemblages at the Tuinier Farm and Anglin sites belong with the western ceramic tradition of the Titus phase Caddo (Perttula 2005, editor:404-405): this tradition is marked by higher frequencies of plain wares than eastern ceramic tradition Titus phase sites, punctated utility wares, and La Rue Neck Banded utility wares, abundant use of red-slipping on fine ware vessels, as well as several unspecified varieties of Ripley Engraved. Western tradition Titus phase sites occur in the middle and upper parts of the Big Cypress Creek basin, as well as sites in the upper Sabine and White Oak Creek basins (Figure 62). Western tradition sites tend also to have trade wares from McCurtain phase Caddo groups living along the mid-reaches of the Red River. Eastern ceramic tradition Caddo sites lie in the middle and lower parts of the Big Cypress Creek basin. The utility wares are dominated by brushed jars, including Bullard Brushed and Karnack Brushed-Incised, more Harleton Appliqued vessels, as well as several varieties of Ripley Engraved. Other important fine wares in the eastern ceramic tradition sites include Taylor Engraved, Simms Engraved, and Bailey Engraved (Perttula 2005, editor: Table 11-10). In general, the eastern ceramic tradition Titus phase sites contain more trade wares from Belcher phase Caddo groups that lived to the east along the Red River in Northwest Louisiana and Southwest Arkansas.

The basic differences in eastern and western ceramic traditions within Titus phase sites suggests that there were long-standing dichotomies in belief and cultural practices that may have existed for 150-200 years. This dichotomy suggests that there were well-defined social boundaries between the different Titus phase communities—including the community that lived on Stouts Creek—inside and outside the Big Cypress Creek basin and that the cultural landscape across the Titus phase area (Figure 62) was complex and dynamic. Nevertheless, the sharing of a variety of Ripley Engraved motifs across the many different communities, and the basic similarity in much of the utility wares from one area to another, indicates that there was considerable intra-areal interaction and contact between each of the Titus phase communities.

The ceramic decorative category data included in Table 25 points to *close stylistic and cultural affiliations between the Stouts Creek Titus phase sites and contemporaneous Titus phase sites in the Dry Creek locality in the Lake Fork Creek basin not far to the south* (see Figure 62). Sites in these two areas share the considerable use of neck banded and appliqued utility wares, a minimal use of brushed utility wares, and the relative importance of red-slipped vessels (either plain red-slipped bowls and

Table 25. Comparison of selected decorative categories in Late Caddo ceramic assemblages in part of the upper Sabine, Big Cypress, and Sulphur River drainages.

Sites	Decorative Categories				
	Neck banded	Appliqued	Brushed	Red-slipped	N
Stouts Creek					
Tuinier Farm	7.4*	12.4	7.8	2.5	283
Anglin	10.5	17.0	3.2	14.7	1347
Dry Creek Locality, Lake Fork Creek basin					
Steck	14.5	11.4	9.4	16.7	922
Goldsmith	20.4	9.7	7.5	6.5	93
Pine Tree	25.0	24.4	0.5	0.0	404
Burks	4.3	6.1	16.6	24.3	820
Caney Creek Locality, Lake Fork Creek Basin					
Spoonbill**	2.7	4.1	3.4	N/A	296
Gilbreath	0.0	15.8	0.0	N/A	38
Killebrew	5.5	7.8	0.0	N/A	218
Big Cypress Creek, western basin					
Pilgrim's Pride	2.3	0.9	45.8	7.0	3952
Underwood	5.7	1.8	35.3	13.3	1034
White Oak Creek, western Sulphur River basin					
James Owens	12.2	10.8	14.9	23.0	74
East Piney Creek, western Sulphur River basin					
Ear Spool, CI	0.8	6.4	30.4	6.6	606
Ear Spool CII	0.9	2.5	52.4	3.5	1025

*percentage of each decorative category in the total assemblage of decorated sherds from the site

**Anglin Impressed sherds are also present at this site along with inverted rim Taylor Engraved vessels (Walters 2007) and Keno Trailed (Walters 1998), another protohistoric Caddo ceramic type; N/A=It is unclear from Bruseth and Perttula (1981:Table 5-4) if slipped sherds are also decorated or not, so it was impossible to tabulate the occurrence of undecorated red-slipped sherds in the same way as the other sites. Bruseth and Perttula (1981:Table 5-4) do indicate that 2.6% of the rim and decorated sherds from Spoonbill, 5.8% from Gilbreath, and 1.8% from Killebrew have a red slip.

Sources: This volume: Tuinier Farm and Anglin; Perttula 2005, ed.: Steck, Pine Tree, and Pilgrim's Pride sites; Perttula et al. 1993: Goldsmith; Perttula 2005: Burks; Bruseth and Perttula 1981: Spoonbill, Gilbreath, and Killebrew; Nelson and Perttula 2003: Underwood; Walters et al. 2003: James Owens; Perttula and Sherman 2008: Ear Spool, components I (ca. A.D 1400-1480) and II (ca. A.D. 1480 to the early 1600s).

carinated bowls or engraved red-slipped carinated bowls). Downstream on White Oak Creek, the ceramic assemblage from the James Owens site also has considerable amounts of neck banded and appliqued utility ware sherds and red-slipped vessel sherds, as well as a moderate proportion of brushed jar sherds (see Table 25). Appliqued utility wares are important in Caney Creek locality Titus phase sites, but red-slipped sherds, neck banded sherds, and brushed pottery sherds are relatively negligible

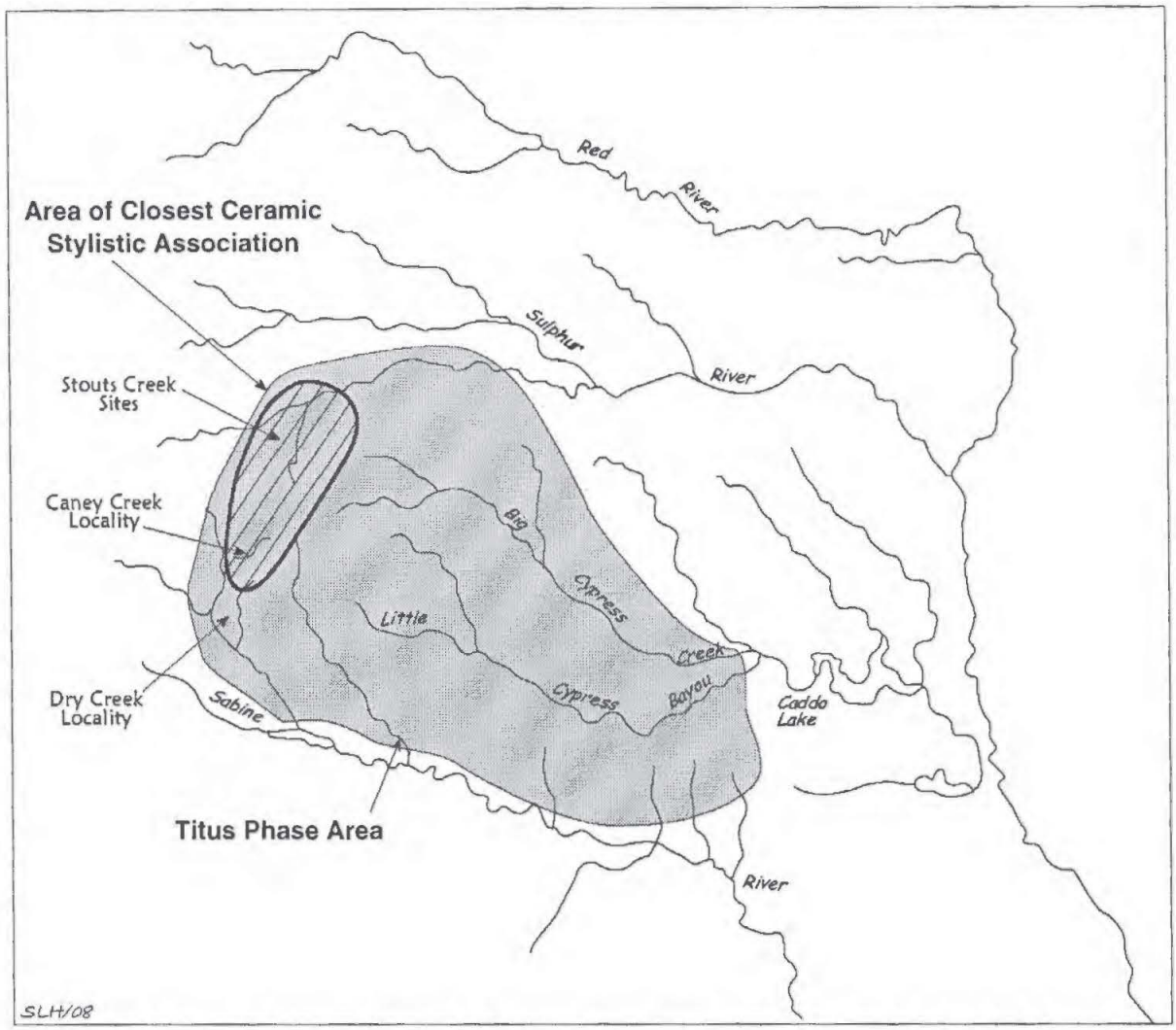

Figure 62. Map of the Titus phase area, depicting the area with sites having the closest stylistic associations with the ceramic assemblages in the Stouts Creek locality.

(see Table 25). Red-slipped vessel sherds are also an important part of Titus phase ceramic assemblages at the Pilgrim's Pride and Underwood sites in the western part of the Big Cypress Creek drainage, but here brushed jar sherds are proportionally quite common (35-46% of all the decorated sherds), as they are at the Ear Spool site in the western part of the Sulphur River basin (see Table 25).

Another way to measure the stylistic and cultural associations between contemporaneous Titus phase sites is with the consideration of the plain to decorated sherd ratio (P/DR) in their ceramic assemblages. The P/DR expresses the proportions with which vessel surfaces are decorated as detected in plain and decorated sherd counts, and there are interesting spatial and temporal trends in the P/DR of specific Caddo ceramic assemblages and traditions in Northeast Texas (Perttula 2004:390). For instance, unlike contemporaneous Late Caddo groups in northwestern Louisiana and eastern Texas that made ceramics where large portions of vessel surfaces were decorated (particularly with the introduction of brushing on the bodies of utility ware jars), and the proportions of decorated sherds in an assemblage may be as much as 50-60% of all the sherds (with P/DR ratios of less than 1.0), McCurtain phase ceramics from the middle Red River area have P/DR ratios that are greater than 40.0 (Perttula 2008:348-349). The proportion of decorated sherds in these assemblages is only about 2-3%, and it is clear that the ceramic tradition of the McCurtain phase Caddo was one comprised predominantly of plain vessels

and large rim-decorated vessels with plain and expansive bodies. At the other extreme, in the early 18th century Deshazo site in the Angelina River basin in East Texas, the proportion of decorated sherds in the assemblage is an impressive 77% (dominated by brushed sherds), with a P/DR of 0.29 (see Fields 1995).

Of the sites listed in Table 25 that have some measure of ceramic stylistic relationships with the Tuinier Farm and Anglin sites, those with the most similar P/DR in their ceramic assemblages are Titus phase sites 20-30 km to the east-southeast (in the case of the Pilgrim's Pride and Underwood sites) and east-northeast (in the case of the Ear Spool site) in the Big Cypress Creek basin (Table 26). The most divergent with respect to their P/DR values from the Stouts Creek sites are several Titus phase sites in the Dry Creek and Caney Creek localities in the upper Sabine River basin, which is ironic given that they are not geographically distant (see Figure 62) and are also stylistically much the same in the kinds of decorated wares, at least in respect to the prominence of Ripley Engraved vessels, the use of red slipping, and in the character of their principal utility wares (see Table 25), especially the use of neck banded and appliqued decorations on jars and the infrequent use of brushing on utility ware vessels.

Taking these two measures together (i.e., selected decorative categories and P/DR), it is apparent that the closest stylistic and cultural affiliations of the Stouts Creek Titus phase sites lie with other Titus phase communities within a 20-30 km radius to the north, south, and east-southeast. Even within these areas, however, there existed considerable local and intra-areal diversity in the character of the decorated utility ware and fine ware vessels made and used by different but socially interactive Titus phase communities.

In summary, the Tuinier Farm, Anglin, and R. A. Watkins sites are part of a very distinctive western Titus phase community that lived in the Post Oak Savannah in the Stouts Creek valley in the 16th century and much of the 17th century A.D; the Culpepper site (see Scurlock 1962) is another component in the community. Their unique archaeological nature rests in the character of their material culture: particularly with the fine ware and utility ware ceramics they made and used (among them Anglin Impressed, a

Table 26. Plain to decorated sherd ratios (P/DR) in select assemblages in the upper Sabine, White Oak Creek, and western Big Cypress Creek drainage basins in Northeastern Texas.

Site	Stream basin	Total No. of Sherds	Proportion Decorated	P/DR
Pilgrim's Pride	Big Cypress Creek	9540	41%	1.41
Tuinier Farm	**White Oak Creek**	**743**	**38%**	**1.62**
Ear Spool	White Oak Creek	6167	30%	2.16
Anglin	**White Oak Creek**	**4606**	**29%**	**2.42**
Underwood	Big Cypress Creek	3807	27%	2.68
Goldsmith	Upper Sabine, Dry Creek locality	368	25%	3.23
James Owens	White Oak Creek	320	23%	3.32
Burks	Upper Sabine, Dry Creek locality	4300	19%	4.24
Gilbreath	Upper Sabine, Caney Creek locality	390	10%	9.26
Killebrew	Upper Sabine, Caney Creek locality	2855	8%	11.58

new utility ware type), as well as the abundance of clay ear spools and figurine fragments found in domestic contexts, suggesting they were in regular use within the community, and the use of marine shell Clements style ear disks, also found in domestic contexts. These particular kinds of artifacts are rarely found at any other Caddo sites in Northeast Texas, much less other parts of the Caddo archaeological area, even in important mortuary or mound contexts, and speaks to the distinctive cultural practices and adaptive strategies employed by this Titus phase community to successfully thrive in the Post Oak Savannah of Northeast Texas. By all measures, this community thrived until ca. A.D. 1700, after which they abandoned the area.

END NOTES

1. The historic artifacts found at the Tuinier Farm and Anglin sites date from the 19th century and are not associated with the 16th and 17th century Caddo occupations. At Tuinier, a total of 25 cut nails (24 with heads and one nail shank), possibly Type 7 forms (1834-1847) but more likely Type 8 examples (1820-1891) (see Wells 2000:335), had been collected from the surface of the South midden, suggesting a log structure stood in this area. At the Anglin site, there were two pieces of glazed hand-made brick fragments.

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Appendix 1

Inventory of Recovered Artifacts in 2007 Investigations

Tuinier Farm (41HP237)

General surface	1 engraved sherd
ST 1, 0-20 cm	1 quartzite lithic debris; 1 petrified wood lithic debris; 4 plain body sherds; 2 engraved sherds; 1 appliqued sherd
ST 1, 20-40 cm	3 plain body sherds
ST 2, 0-20 cm	1 engraved sherd; 1 plain body sherd
ST 3, 0-20 cm	1 quartzite lithic debris; 1 plain body sherd
ST 4, 0-20 cm	1 plain rim sherd; 2 plain body sherds; 1 plain base sherd; 1 trailed sherd; 1 burned clay
ST 4, 20-25 cm	2 plain body sherds
ST 5, 0-20 cm	1 plain body sherd
ST 6, 0-20 cm	3 plain body sherds; 1 plain base sherd; 1 burned clay; 1 clay object
ST 6, 20-30 cm	3 plain body sherds; 1 engraved rim sherd
Unit 1, 0-10 cm	29 plain body sherds; 2 plain base sherds; 1 neck banded sherd; 1 appliqued sherd; 1 punctated sherd; 1 incised sherd; 6 engraved sherds
Unit 1, 10-20 cm (South Midden)	5 quartzite lithic debris; 2 petrified wood lithic debris; 1 quartzite flake tool; 2 elbow pipe rims; 1 plain rim sherd; 56 plain body sherds; 4 plain base sherds; 11 engraved sherds; 2 corn-cob impressed sherds; 2 brushed sherds; 6 appliqued sherds; 18 burned clay
Unit 1, 20-30 cm	1 quartzite lithic debris; 1 petrified wood lithic debris; 1 plain rim sherd; 11 plain body sherds; 2 corn-cob impressed sherds; 1 appliqued sherd; 1 clay coil; 3 burned clay
South Midden	1 quartzite side scraper; 2 incised sherds; 1 corn-cob impressed sherd; 1 red-slipped sherd; 1 punctated sherd; 18 engraved sherds; 2 plain rim sherds; 26 plain body sherds; 1 plain base sherd
Unit 2, 0-10 cm	1 plain rim sherd; 14 plain body sherds; 1 plain base sherd; 3 engraved sherds; 1 quartzite lithic debris; 1 burned clay
Unit 2, 10-20 cm	10 quartzite lithic debris; 3 plain rim sherds; 44 plain body sherds; 1 plain base sherd; 2 incised sherds; 2 brushed sherds; 6 engraved sherds; 2 red-slipped sherds; 2 appliqued sherds; 1 drilled body sherd; 2 burned clay
Unit 2, 20-30 cm	6 quartzite lithic debris; 1 petrified wood lithic debris; 1 light gray chert lithic debris; 31 plain body sherds; 1 plain rim sherd; 1 plain base sherd; 3 appliqued sherds; 1 neck banded sherd; 1 brushed sherd; 8 engraved sherds; 1 clay bead; 3 burned clay
North Midden at Unit 2	10 plain body sherds; 1 plain base sherd; 1 engraved sherd
Unit 3, 0-10 cm	2 quartzite lithic debris; 1 gray novaculite flake tool; 4 plain rim sherds; 29 plain body sherds; 2 engraved sherds; 1 incised sherd; 1 possible pipe sherd

Unit 3, 10-20 cm	11 burned clay; 2 plain rim sherds; 52 plain body sherd; 2 plain base sherds; 1 corn-cob impressed sherd; 3 neck banded sherds; 3 punctated sherds; 3 appliqued sherds; 2 incised sherds; 9 engraved sherds; 5 quartzite lithic debris
Unit 3, 20-30 cm	8 burned clay; 1 daub; 38 plain body sherds; 1 plain base sherd; 2 incised sherds; 2 engraved sherds; 1 corn-cob impressed sherd; 1 brushed sherd; 4 appliqued sherds; 1 ferruginous sandstone abrader
Unit 4, 0-10 cm	7 plain body sherds; 1 appliqued sherd; 1 neck banded sherd
Unit 4, 10-20 cm	2 quartzite lithic debris; 1 brown chert lithic debris; burned clay present but not tabulated; 5 plain rims; 11 plain body sherds; 4 plain base sherds; 1 brushed sherd; 2 engraved sherds; 1 red-slipped sherd; 1 engraved-punctated elbow pipe sherd
Unit 4, 20-30 cm	2 petrified wood lithic debris; 1 quartzite lithic debris; 1 engraved-punctated elbow pipe rim sherd; 2 engraved sherds; 1 corn-cob impressed sherd; 2 clay objects; 15 plain body sherds; 2 plain base sherds; burned clay not tabulated
Midden 2 surface	7 plain body sherds; 1 plain base sherd; 1 engraved sherd; 1 trailed sherd
Northeast of Midden 2	1 engraved sherd

Anglin Site (41HP240)

ST B, 0-20 cm	1 quartzite lithic debris
ST B, 20-40 cm	1 quartzite lithic debris; 1 fire-cracked rock (ferruginous sandstone); 2 plain body sherds
ST B, 40-60 cm	4 quartzite lithic debris; 2 plain body sherds
ST C, 0-20 cm	2 quartzite lithic debris
ST C, 20-40 cm	3 plain body sherds
ST 1, 0-20 cm	2 quartzite lithic debris; 1 engraved sherd
ST 2, 0-20 cm	1 daub; 3 plain body sherds; 1 red-slipped body sherd
ST 2, 20-40 cm	3 quartzite lithic debris; 1 petrified wood lithic debris; 1 plain body sherd; 2 engraved sherds
Unit 1, 0-10 cm	5 quartzite lithic debris; 2 petrified wood lithic debris; 6 plain body sherds
Unit 1, 10-20 cm	2 novaculite lithic debris; 5 petrified wood lithic debris; 26 quartzite lithic debris; 1 claystone-siltstone flake tool; 1 clay object; 1 plain rim sherd; 12 plain body sherd; 3 brushed sherds; 1 incised sherd
Unit 2, 0-10 cm	5 quartzite lithic debris; 10 plain body sherds; 3 engraved sherds; 1 brushed sherd; 1 red-slipped sherd
Unit 2, 10-20 cm	7 quartzite lithic debris; 13 plain body sherds; 1 punctated sherd; 1 red-slipped sherd; 1 engraved sherd
Unit 2, 20-25 cm	2 quartzite lithic debris; 9 plain body sherds; 3 engraved sherds; 1 punctated sherd
Unit 3, 0-10 cm	4 quartzite lithic debris; 1 plain rim sherd; 8 plain body sherds; 3 engraved sherds; 2 red-slipped sherds; 1 punctated sherd; 1 appliqued sherd

Unit 3, 10-20 cm	1 limonite pigment stone; 1 petrified wood lithic debris; 6 quartzite lithic debris; 1 quartzite flake tool; 3 burned clay; 2 plain rim sherds; 8 plain body sherds; 3 engraved sherds
Unit 3, 20-30 cm	2 petrified wood lithic debris; 1 brown chert lithic debris; 1 dark gray chert lithic debris; 13 quartzite lithic debris; 4 burned clay; 2 plain rim; 16 plain body sherds; 1 plain base sherd; 2 engraved sherds; 1 red-slipped sherd; 1 neck-banded sherd
Unit 3, 30-40 cm	4 petrified wood lithic debris; 9 quartzite lithic debris; 4 burned clay; 19 plain body sherds; 2 plain base sherds; 3 engraved sherds; 1 red-slipped sherd

APPENDIX 2

Inventory of Faunal Remains from the Tuinier Farm (41HP237) and Anglin (41HP240) Sites

Appendix 2												
						Tuinier site						
LS Bag No	TU	Depth	Feat	Qty	Taxon	Elem/Por	Side	Age	Burn	Mod	Wt/g	Comments
1		surf	S.midden	1	deer	hum dist med	L		b		6.2	
1		surf	S.midden	1	deer	astragalus	L		n		9.8	
1		surf	S.midden	1	deer	astragalus	L		n		9.7	
1		surf	S.midden	1	deer	astragalus	L		n		10.7	
1		surf	S.midden	1	deer	astragalus	R		n		13.3	
1		surf	S.midden	1	deer	astragalus	R		n		10.2	
1		surf	S.midden	1	deer	astragalus	R		n		7.3	
1		surf	S.midden	1	deer	calc shft	L		n		8.4	
1		surf	S.midden	1	deer	fem shft frg			n		4.6	sp frac
1		surf	S.midden	1	deer	mtcar dx		imm	n		13.1	sp frac
1		surf	S.midden	1	deer	mtcar prox	R		n		11.8	sp frac
1		surf	S.midden	1	deer	nav-cub	R		n		7.6	
1		surf	S.midden	1	deer	rad shft			n		9.9	sp frac
1		surf	S.midden	1	deer	rad shft frg			n		3.2	sp frac
1		surf	S.midden	1	deer	tib dx epiph	L	imm	n		5.3	
1		surf	S.midden	1	deer	tib shft frg	R		n		12.3	sp frac
1		surf	S.midden	1	deer	tib shft frg			n		5.3	sp frac
1		surf	S.midden	2	deer	phx1	L		n		8.7	
1		surf	S. midden	2	turtle	shell frg			n		14.7	"water worn"; lg. indiv
2		surf	midden	1	canid	hum dist	L		n		9.5	
2		surf	midden	1	canid	mand condyle	R		n		2.1	
2		surf	midden	1	canid	max frg	L		n		3.8	
2		surf	midden	1	canid	tib prox	L		n		4.4	
2		surf	midden	1	canid	ulna prox	R		n		5.3	
2		surf	midden	1	canid	vert	A	imm	n		3	
2		surf	midden	1	canid	vert	A		n		3.6	
2		surf	midden	1	deer	fem shft frg	L		b		23.2	sp frac
2		surf	midden	1	deer	atlas frg			n		19.5	
2		surf	midden	1	deer	calcaneus	R	imm	n		19.1	
2		surf	midden	1	deer	fem shft frg			n		12.9	sp frac
2		surf	midden	1	deer	fem shft frg			n		9.1	sp frac
2		surf	midden	1	deer	hum dist	L		n		28	sp frac
2		surf	midden	1	deer	hum dist	R		n		23.6	sp frac
2		surf	midden	1	deer	ishium frg	L		n		5.2	
2		surf	midden	1	deer	M2 lo root	R		n		0	in socket
2		surf	midden	1	deer	M3 lo	R		n		0	in socket
2		surf	midden	1	deer	mand t'row	R		n		14.9	
2		surf	midden	1	deer	mtpod shft frg			n		9.7	sp frac
2		surf	midden	1	deer	mttar prox	L		n		33.3	sp frac

2		surf	midden	1	deer	rad dist	R		n		27.1	sp frac
2		surf	midden	1	deer	rad shft+prox frg	L		n		16.7	sp frac
2		surf	midden	1	deer	rib shft			n		7	
2		surf	midden	1	deer	tib dist	L		n		23.4	sp frac
2		surf	midden	1	deer	tib px	R	imm	n		10	sp frac
2		surf	midden	1	deer	ulnar notch	R		n		5.4	
2		surf	midden	1	deer	vert	A	imm	n		9.7	
2		surf	midden	1	deer	vert	A		n		13.7	
2		surf	midden	1	turkey	hum prox	L		n		14.7	prox cond absent
2		surf	midden	1	turkey	hum shft	L		n		7.4	
2		surf	midden	1	turkey	rad shft			n		3.5	
2		surf	midden	1	turkey	tbt dist	R		n		4	
2		surf	midden	1	turkey	tbt shft	L		n		8	
3		surf	midden	1	box turtle	periph+carapace frg	A		n		6.6	
3		surf	midden	1	box turtle	xiphiplastron	R		n		2.2	
3		surf	midden	1	canid	acetab frg	L		n		2.1	
3		surf	midden	1	canid	astragalus	L		n		2.1	
3		surf	midden	1	canid	astragalus	L		n		2	
3		surf	midden	1	canid	C lo	R		n		0.9	
3		surf	midden	1	canid	calcaneus	R		n		2.8	
3		surf	midden	1	canid	hum px epiph	L	imm	n		2.3	
3		surf	midden	1	canid	M1 lo	R		n		0	in socket
3		surf	midden	1	canid	M3 lo	R		n		0	in socket
3		surf	midden	1	canid	mand t'row	R		n		10.5	
3		surf	midden	1	canid	Mt5	L		n		1.2	
3		surf	midden	1	canid	PM4 lo	R		n		0	in socket
3		surf	midden	1	canid	tib dist	R		n		2.2	
3		surf	midden	1	canid	ulnar notch frg	R		n		2.8	
3		surf	midden	1	deer	scaphoid	R		b		2.8	
3		surf	midden	1	deer	tib dist	L		b		26	sp frac
3		surf	midden	1	deer	astragalus	R		n		10.2	
3		surf	midden	1	deer	calcaneus	L		n		14.5	
3		surf	midden	1	deer	fem prox	L		n		13.8	sp frac
3		surf	midden	1	deer	fem shft	L		n		23.7	sp frac
3		surf	midden	1	deer	fem shft frg	L		n		3.3	sp frac
3		surf	midden	1	deer	fem shft frg	R		n		10.1	sp frac
3		surf	midden	1	deer	hum shft frg	L		n		7.6	sp frac
3		surf	midden	1	deer	hum shft frg	L		n		5.9	sp frac
3		surf	midden	1	deer	hum shft frg	R		n		12	sp frac
3		surf	midden	1	deer	mand post frg	R		n		7.6	
3		surf	midden	1	deer	mtcar dist			n		14	sp frac
3		surf	midden	1	deer	mtpod shft frg			n		7.3	sp frac

3		surf	midden	1	deer	phx1	R		n		6.7	
3		surf	midden	1	deer	phx1 dist	R		n		3.3	sp frac
3		surf	midden	1	deer	phx2	L		n		3.1	
3		surf	midden	1	deer	rad prox	R		n		8.6	sp frac
3		surf	midden	1	deer	rad shft frg			n		8.4	sp frac
3		surf	midden	1	deer	rid head			n		5	
3		surf	midden	1	deer	scap head	R		n		10.9	
3		surf	midden	1	deer	thor spinous process	A		n		3.1	
3		surf	midden	1	deer	tib prox	L		n		19.8	fusing
3		surf	midden	1	deer	tib shft frg	R		n		17	sp frac
3		surf	midden	1	deer	tib shft frg	R		n		11.2	sp frac
3		surf	midden	1	deer	tib shft frg			n		7.6	sp frac
3		surf	midden	1	deer	ulna prox	R		n		8.1	
3		surf	midden	1	deer	vert centrum	A	imm	n		5.7	
3		surf	midden	1	turkey	fem shft frg			n		2.1	sp frac
3		surf	midden	1	turkey	innom frg	R		n		2.7	
3		surf	midden	1	turkey	rad shft			n		0.6	sp frac
3		surf	midden	1	turkey	tbt shft	L		n		3.5	sp frac
3		surf	midden	1	turkey	tmt dist	L		n		4.1	sp frac
3		surf	midden	1	turkey	ulna shft			n		2.4	sp frac
3		surf	midden	2	canid	rad shft			n		6.3	
3		surf	midden	2	deer	vert	A		n		35.4	
3		surf	midden	3	canid	vert	A		n		12.3	
3		surf	midden	3	deer	vert	A	imm	n		67.2	
4		surf	midden	1	canid	fem dist	R		n		11.4	
4		surf	midden	1	canid	fem prox	L		n		6.4	
4		surf	midden	1	canid	fem prox	R		n		8.3	
4		surf	midden	1	canid	innom	R		n		8.9	
4		surf	midden	1	canid	mand frg			n		2.4	
4		surf	midden	1	canid	rad prox	R		n		3.2	
4		surf	midden	1	canid	rad prox	R		n		3.4	
4		surf	midden	1	canid	tib dist+shft	L		n		9.4	
4		surf	midden	1	canid	tib prox+shft	R		n		11.5	
4		surf	midden	1	canid	tibia	R		n		15.7	
4		surf	midden	1	canid	ulnar notch	R		n		2.2	
4		surf	midden	1	deer	phx1	R		b		6.5	
4		surf	midden	1	deer	fem shft frg	R		n		10.2	sp frac
4		surf	midden	1	deer	fem shft frg			n		12.5	sp frac
4		surf	midden	1	deer	M1 lo	R		n		0	in socket
4		surf	midden	1	deer	mand cond+asend ram	L		n		5	
4		surf	midden	1	deer	mand t'row	R		n		17.6	
4		surf	midden	1	deer	PM3 lo	R		n		0	in socket

4		surf	midden	1	deer	PM4 lo	R		n		0	in socket
4		surf	midden	1	deer	rad prox	L		n		8.5	sp frac
4		surf	midden	1	deer	rad prox med	L		n		10.6	sp frac
4		surf	midden	1	deer	rad prox med	L		n		8.7	sp frac
4		surf	midden	1	deer	rib head+shft			n		5.8	
4		surf	midden	1	deer	scap	L		n		45.5	
4		surf	midden	1	deer	tib crest	R		n		8.9	sp frac
4		surf	midden	1	deer	tib prox	R		n		57.2	sp frac
4		surf	midden	1	deer	ulna px	L	imm	n		13.4	
4		surf	midden	1	deer	ulna px	L	imm	n		5.8	
4		surf	midden	1	turkey	hum shft	L		n		11.5	
4		surf	midden	1	turkey	hum shft	R		n		4.9	sp frac
4		surf	midden	1	turkey	tbt shft	L		n		20.9	sp frac
4		surf	midden	1	turkey	thoracic	A		n		8.6	
4		surf	midden	1	turkey	ulna shft	R		n		4	inc prox frg
4		surf	midden	1	turkey	ulna shft	R		n		7.8	
4		surf	midden	2	canid	vert	A		n		4.7	
4		surf	midden	2	deer	vert	A		n		35.9	
5		surf	S. midden	1	deer	PM3 lo	R		n		1	
5		surf	S. midden	1	deer	rad prox	R		n		10.3	sp frac
6		surf	midden	1	box turtle	peripheral			b		2.6	
6		surf	midden	1	canid	M1 lo	L		n		0	in socket
6		surf	midden	1	canid	M2 lo	L		n		0	in socket
6		surf	midden	1	canid	mandible t'row	L		n		17.5	
6		surf	midden	1	canid	max t'row	R		n		3.3	
6		surf	midden	1	canid	PM2 lo	L		n		0	in socket
6		surf	midden	1	canid	PM3 lo	L		n		0	in socket
6		surf	midden	1	canid	PM3 up	R		n		0	in socket
6		surf	midden	1	canid	PM4 lo	L		n		0	in socket
6		surf	midden	1	canid	PM4 up	R		n		0	in socket
6		surf	midden	1	canid	tib dist+shft	R		n		10	
6		surf	midden	1	deer	hum dist	L		n		40.9	sp frac
7		b'pit area	midden	1	gar	scale			n		0.4	
8		surf	midden	1	bovid	incisor lo	R		n	drilled	2.2	
8		surf	midden	1	canid	C lo	R		n		1.1	
8		surf	midden	1	opossum	C up	R		n	drilled	0.8	hi-polish
9		surf	midden	1	raccoon	fib dist	R		n	awl (sharp)	1.2	finely crafted
10		surf	mid 2	1	deer	hum dist	L		n		12.2	
11		surf	midden 3	1	box turtle	peripheral			b		1.6	
12	4	20to30	midden 4	1	box turtle	peripheral			b		0.2	FLOT
12	4	20to30	midden 7	1	box turtle	hypoplastron frg	L		n		0.4	FLOT
12	4	20to30	midden 8	1	box turtle	hypoplastron frg	L		n		0.1	FLOT

12	4	20to30	midden 5	3	turtle	shell frg			b		0.5	FLOT
12	4	20to30	midden 6	5	turtle	shell frg			n		0.5	FLOT
13	1	0to10	midden 10	1	c'tail	fem shft frg			n		0.3	
13	1	0to10	midden 14	1	c'tail	M1 lo	R		n		0	in socket
13	1	0to10	midden 15	1	c'tail	M2 lo	R		n		0	in socket
13	1	0to10	midden 11	1	c'tail	mand t'row	R		n		1.5	
13	1	0to10	midden 12	1	c'tail	PM3 lo	R		n		0	in socket
13	1	0to10	midden 13	1	c'tail	PM4 lo	R		n		0	in socket
13	1	0to10	midden 16	1	deer	rad prox frg			n		3.2	sp frac
13	1	0to10	midden 17	1	raccoon	hum shft	L		b		3.5	
13	1	0to10	midden 9	1	turtle	shell frg			b		0.6	
14	1	10to20	S. midden	1	box turtle	epi,hyo+entoplastron	A		n		8.9	front half plastron
14	1	10to20	S. midden	1	box turtle	hyoplastron	L		n		1.8	
14	1	10to20	S. midden	1	box turtle	hyoplastron frg			n		0.3	"bridge"
14	1	10to20	S. midden	1	box turtle	hypoplastron frg	R		n		0.6	"bridge"
14	1	10to20	S. midden	1	box turtle	nuchal frg+peripheral	A		n		1.5	
14	1	10to20	S. midden	1	box turtle	peripheral			n		0.2	
14	1	10to20	S. midden	1	box turtle	peripheral+carapace	R		n		4	"bridge"
14	1	10to20	S. midden	1	box turtle	xiphiplastron frg	L		n		0.8	"edge"
14	1	10to20	S. midden	1	canid	Mt3	R		n		1.1	
14	1	10to20	S. midden	1	canid	phx			n		0.3	
14	1	10to20	S. midden	1	canid	zygo frg			n		0.4	
14	1	10to20	S. midden	1	deer	mand t'row	L	5or4y	n	tool	48.8	polish, ground
14	1	10to20	S. midden	1	deer	antler tip			n		1.4	
14	1	10to20	S. midden	1	deer	M1 lo	L	5or4y	n		0	in socket
14	1	10to20	S. midden	1	deer	M2 lo	L	5or4y	n		0	in socket
14	1	10to20	S. midden	1	deer	M3 lo	L	5or4y	n		0	in socket
14	1	10to20	S. midden	1	deer	PM3 lo	L	5or4y	n		0	in socket
14	1	10to20	S. midden	1	deer	PM4 lo	L	5or4y	n		0	in socket
14	1	10to20	S. midden	1	deer	rad dist frg	R		n		2	
14	1	10to20	S. midden	1	deer	thoracic facet	A		n		1.3	
14	1	10to20	S. midden	1	squirrel	incisor lo	R		n		0.1	
14	1	10to20	S. midden	1	squirrel	scap head	L		n		0.2	
14	1	10to20	S. midden	2	box turtle	plastron frg			n		1.1	"edge"
14	1	10to20	S. midden	2	turtle	shell frg			b		0.5	
14	1	10to20	S. midden	3	box turtle	peripheral			b		1.4	
14	1	10to20	S. midden	12	turtle	shell frg			n		3.9	
15	1	20to30	midden 48	1	c'tail	calc platform	L		b		0.4	
15	1	20to30	midden 45	1	deer	mtpod shft frg			b		2	sp frac
15	1	20to30	midden 44	1	deer	nav-cub	L		n		7.7	
15	1	20to30	midden 47	1	jack/swamp	fem shft frg			n		0.9	
15	1	20to30	midden 46	1	turkey	tmt shft frg			n		0.2	

16	2	0to10	midden 50	1	deer	phx1 dist frg	R		n		0.8	sp frac
16	2	0to10	midden 49	1	turtle	shell frg			b		1.2	
17	2	10to20	midden 56	1	box turtle	peripheral frg			n		0.5	
17	2	10to20	midden 55	1	deer	antler frg			b		1	
17	2	10to20	midden 52	1	deer	mtpod shft frg			b		0.4	
17	2	10to20	midden 53	1	deer	rad shft frg			b		1.1	sp frac
17	2	10to20	midden 54	1	deer	phx1 prox frg	R		n		0.6	
17	2	10to20	midden 51	1	deer	vert epiph	A	imm	n		1	
18	2	20to30	midden 60	1	canid	PM3 up	L		n		0.4	
18	2	20to30	midden 63	1	deer	mtpod shft frg			b		0.7	
18	2	20to30	midden 66	1	deer	antler frg			n		2.3	
18	2	20to30	midden 62	1	deer	atlas frg	A		n		1.5	
18	2	20to30	midden 61	1	deer	calc dx epiph	L	imm	n		2	
18	2	20to30	midden 64	1	deer	mttar shft frg+prox frg	R		n		9.4	sp frac
18	2	20to30	midden 59	1	squirrel	fem prox	R		n		0.2	
18	2	20to30	midden 58	1	squirrel	scap head	L		n		0.1	
18	2	20to30	midden 57	1	turkey	tbt shft frg	R		n		5.5	
18	2	20to30	midden 65	2	deer	fem shft frg			n		4.2	sp frac
19	3	0to10	midden 68	1	canid	scap head	R		n		1.4	
19	3	0to10	midden 70	1	raccoon	rad prox	L		b		0.4	
19	3	0to10	midden 69	1	raccoon	ulna prox	L		n		1.8	
19	3	0to10	midden 67	2	box turtle	peripheral			n		1.6	
20	3	10to20	midden 76	1	box turtle	hyoplastron frg	R		b		0.7	almost complete
20	3	10to20	midden 72	1	box turtle	peripheral			b		2.4	
20	3	10to20	midden 75	1	box turtle	hyoplastron	R		n		1.7	
20	3	10to20	midden 77	1	box turtle	hyoplastron frg	L		n		0.6	
20	3	10to20	midden 78	1	box turtle	hypoplastron frg	L		n		0.5	"bridge"
20	3	10to20	midden 73	1	box turtle	peripheral			n		2.6	
20	3	10to20	midden 74	1	box turtle	peripheral+pleural			n		1.2	
20	3	10to20	midden 85	1	bullfrog	innominate	R		n		0.7	
20	3	10to20	midden 86	1	bullfrog	pubis	A		n		0.4	
20	3	10to20	midden 71	1	deer	hum dist	L		n		17.5	sp frac
20	3	10to20	midden 84	1	deer	phx prox frg			n		0.4	
20	3	10to20	midden 80	1	deer	tib shft frg			n		3.5	sp frac
20	3	10to20	midden 81	1	opossum	vert	A		n		1.3	
20	3	10to20	midden 88	1	raccoon	scap blade frg	L		n		0.8	
20	3	10to20	midden 87	1	raccoon	scap neck	R		n		1	
20	3	10to20	midden 83	1	squirrel	atlas	A		n		0.2	
20	3	10to20	midden 82	1	squirrel	temporal	R		n		0.2	
20	3	10to20	midden89	1	unid	l.b.frag			b	r+s	0.6	bead debris
20	3	10to20	midden 79	3	box turtle	shell frg			b		1.5	
21	3	20to30	midden 98	1	box turtle	hypoplastron	L		b		2.6	"bridge"+partial R

21	3	20to30	midden 96	1	box turtle	peripheral			n		0.7	
21	3	20to30	midden 99	1	box turtle	plastron frg			n		0.2	
21	3	20to30	midden 97	1	box turtle	pleural			n		2.1	in 2 frgs
21	3	20to30	midden 94	1	canid	astragalus	L		n		1.4	
21	3	20to30	midden 93	1	canid	fib shft			n		0.9	
21	3	20to30	midden 90	1	deer	antler frg			b		4.7	
21	3	20to30	midden 91	1	deer	patella	L		b		3.9	
21	3	20to30	midden 92	1	deer	acetab+ishium frg	L		n		9	
21	3	20to30	midden 95	1	squirrel	hum prox	R		n		0.5	
21	3	20to30	midden 100	2	box turtle	shell frg			b		0.8	
22	4	0to10	midden 101	1	turtle	shell frg			b		0.4	40x40; FS
22	4	0to10	midden 102	2	turtle	shell frg			n		1.2	40x40; FS
23	4	10to20	midden 108	1	box turtle	epiplastron	L		n		0.4	40x40; FLOT
23	4	10to20	midden 107	1	box turtle	hyoplastron	L		n		1.4	40x40; FLOT
23	4	10to20	midden 109	1	deer	antler frg			b		0.3	40x40; FLOT
23	4	10to20	midden 113	1	rabbit	phx prox			n		0.1	40x40; FLOT
23	4	10to20	midden 110	1	squirrel	rad prox	R		n		0.1	40x40; FLOT
23	4	10to20	midden 104	1	turkey	fem shft frg			n		0.6	40x40; FLOT
23	4	10to20	midden 103	1	turkey	tmt dist	L		n		4.1	40x40; FLOT
23	4	10to20	midden 114	1	turtle	phx			n		0.1	40x40; FLOT; lg indiv
23	4	10to20	midden 111	1	v.sm bird	tbt dist	R		n		0.05	40x40; FLOT
23	4	10to20	midden 112	2	fish	unid			n		0.05	40x40; FLOT; sm indiv
23	4	10to20	midden 106	2	turtle	pleural			n		1.8	40x40; FLOT
23	4	10to20	midden 105	8	turtle	shell frg			b		1.6	40x40; FLOT
24		surf	S. midden	1	turtle	shell frg			n		5.6	"water worn"; lg. indiv
25	ST 2	0to20	midden	1	canid	cuboid	L		n		0.6	
25	ST 2	0to20	midden	1	turtle	shell frg			n		0.9	in 2 frgs
26	ST 4	0to20	midden	1	deer	lunate	L		n		1.7	open root
26	ST 4	0to20	midden	1	deer	tooth frg		imm	n		0.5	
27	ST 1	0to20	midden	1	turtle	shell frg			b		0.3	
28	ST 1	20to40	S. midden	3	turtle	shell frg			b		0.7	
29	ST 6	0to20	midden	1	box turtle	peripheral	R		b		0.7	"bridge"
29	ST 6	0to20	midden	1	deer	mtpod shft frg			n		3.9	
29	ST 6	0to20	midden	1	turtle	shell frg			b		0.1	
30	ST 6	20to30	midden	1	box turtle	hypoplastron frg	L		n		0.7	
30	ST 6	20to30	midden	1	deer	phx frg			n		0.6	
30	ST 6	20to30	midden	1	turtle	shell frg			b		0.3	
30	ST 6	20to30	midden	3	box turtle	plastron frg			n		1.1	
						Anglin site						
1		surf	midden	1	armadillo	maxilla frg	R		n		0.5	
1		surf	midden	1	armadillo	vert	A		n		1.2	

1		surf	midden	1	bovid	incisor	L		n	drilled	3.4	incomp hole
1		surf	midden	1	box turtle	nuchal	A		n		1.1	
1		surf	midden	1	c'tail	fem prox	R		n		1.3	
1		surf	midden	1	canid	C lo	L	imm	n		0.4	open root
1		surf	midden	1	canid	C lo	R		n		0.8	
1		surf	midden	1	canid	carpal	L		n		0.5	
1		surf	midden	1	canid	PM4 up	L		n		1.4	
1		surf	midden	1	catfish	spinous process			n		0.7	
1		surf	midden	1	deer	magnum	R		b		1	
1		surf	midden	1	deer	mtpod dist condyle			b		3.4	
1		surf	midden	1	deer	mtpod shft frg			b		1.1	
1		surf	midden	1	deer	nav-cub	L		b		7.1	
1		surf	midden	1	deer	rad prox	L		b		5.7	sp frac
1		surf	midden	1	deer	sacrum centrum frg	A		b		3.8	
1		surf	midden	1	deer	antler frg			n		1	
1		surf	midden	1	deer	calcaneus	R		n		24.6	
1		surf	midden	1	deer	mttar shft frg			n		1.1	
1		surf	midden	1	deer	phx3	R		n		2.6	
1		surf	midden	1	deer	rad prox	L		n		22.7	sp frac
1		surf	midden	1	deer	rad shft			n		21.3	sp frac
1		surf	midden	1	turkey	tbt dist frg			b		0.3	
1		surf	midden	1	turkey	phx			n		0.4	
1		surf	midden	4	deer	tooth frg			n		2.3	
1		surf	midden	5	armadillo	scute			n		1	
1		surf	midden	1	canid	M1 lo	R	aged	n		0	in socket
1		surf	midden	1	canid	M1 lo	R	iverag	n		0	in socket
1		surf	midden	1	canid	PM4 lo	R	iverag	n		0	in socket
1		surf	midden	1	box turtle	hyoplastron	L		n		1.6	
1		surf	midden	1	box turtle	nuchal w/carapace frg	A		n		9.9	3 frgs
1		surf	midden	1	canid	acetabulum	R		n		4.4	2 frgs xmend
1		surf	midden	1	canid	acetabulum	R		n		3.6	
1		surf	midden	1	canid	axis	A		n		4.9	
1		surf	midden	1	canid	C up	L		n		0.9	
1		surf	midden	1	canid	cervical	A	imm	n		3.4	
1		surf	midden	1	canid	fem dist lat	R		n		1.8	
1		surf	midden	1	canid	hum dist	L		n		5.5	
1		surf	midden	1	canid	hum dist	L		n		5.7	
1		surf	midden	1	canid	hum dist	R		n		7.4	
1		surf	midden	1	canid	M1 up	R		n		1	
1		surf	midden	1	canid	mand condyle	R		n		0.4	
1		surf	midden	1	canid	mand t'row	R		n		8.3	
1		surf	midden	1	canid	mand t'row	R		n		11.2	

1		surf	midden	1	canid	Mt3	L		n		1.1	
1		surf	midden	1	canid	Mt4	R		n		1.2	
1		surf	midden	1	canid	Mt5 prox	L		n		0.6	
1		surf	midden	1	canid	mtpod		imm	n		0.2	
1		surf	midden	1	canid	PM4 up	L		n		1.2	
1		surf	midden	1	canid	PM4 up	R	imm	n		0.6	open roots
1		surf	midden	1	canid	rad dx	R	imm	n		3.9	no dx epiph
1		surf	midden	1	canid	rad shft			n		2	
1		surf	midden	1	canid	sacrum frg	A		n		1.7	
1		surf	midden	1	canid	scap head	L		n		1.9	
1		surf	midden	1	canid	ulna prox	L		n		2.9	
1		surf	midden	1	canid	ulna shft	L		n		2.7	
1		surf	midden	1	canid	ulnar notch	L		n		2.4	
1		surf	midden	1	deer	ulna prox	R		n	cuts	15.2	oblique cuts
1		surf	midden	1	deer	antler tip			b		0.6	
1		surf	midden	1	deer	mtcar dist frg			b		7.5	
1		surf	midden	1	deer	mtpod shft frg			b		3.1	
1		surf	midden	1	deer	phx dist frg			b		1.3	spir frac
1		surf	midden	1	deer	calcaneus	R		n		20.8	
1		surf	midden	1	deer	fem dist	L	imm	n		28.8	spir frac;unfused
1		surf	midden	1	deer	fem shft frg			n		5.5	
1		surf	midden	1	deer	hum shft	L		n		16.9	spir frac
1		surf	midden	1	deer	mtpod shft frg			n		8	
1		surf	midden	1	deer	mtpod shft frg			n		4.6	spir frac
1		surf	midden	1	deer	mtpod shft frg			n		4.3	spir frac
1		surf	midden	1	deer	mttar prox ant	L		n		17.2	split longitud
1		surf	midden	1	deer	rad prox	R		n		24.4	spir frac
1		surf	midden	1	deer	tib shft frg			n		18.2	spir frac
1		surf	midden	1	deer	ulna prox	R		n		6.9	
1		surf	midden	1	lg snake	vert	A		n		1.1	spur broken
1		surf	midden	1	pond turtle	pelvis frg	R		n		0.3	
1		surf	midden	1	raccoon	hum dist	L		n		2.9	
1		surf	midden	1	turkey	tbt dist med frg	R		b		0.5	
1		surf	midden	1	turkey	ulna shft frg	R		b		1	
1		surf	midden	1	turkey	hum shft	L		n		10.1	
1		surf	midden	1	turkey	thoracic frg	A		n		1.7	
1		surf	midden	1	turkey	tmt shft	R		n		4.5	
1		surf	midden	1	turkey	ulna dist	R		n		10.7	inc most shft
1		surf	midden	2	canid	lumbar frg	A		n		4.5	
2		surf	midden	1	bovid	astragalus	R		n	cuts	61.5	
2		surf	midden	1	bovid	cervical	A	imm	n		43.2	
2		surf	midden	1	bovid	incisor lo			n		1.9	

2		surf	midden	1	bovid	mtcar dist			n		77.3	"8"
2		surf	midden	1	bovid	mtpod dist condyle			n		28	
2		surf	midden	1	bovid	rib frg			n		16.9	
2		surf	midden	1	bovid	thoracic	A		n		64.4	"20"
2		surf	midden	1	bovid	ulna px	R	imm	n		9.3	px epiph missing
2		surf	midden	1	c'tail	M2 lo	L		n		0	in socket; "19"
2		surf	midden	1	c'tail	mandible	L		n		1.4	no diastema;"19"
2		surf	midden	1	canid	fem dist	R		n		5.5	
2		surf	midden	1	canid	fem shft	R		n		3	
2		surf	midden	1	canid	hum shft	R		n		3.8	"8"
2		surf	midden	1	canid	hum shft	R		n		1.8	"18"
2		surf	midden	1	canid	incisor lo			n		0.4	
2		surf	midden	1	canid	lumbar	A		n		2.6	"18"
2		surf	midden	1	canid	ulna prox	L	imm	n		6.4	px epiph missing
2		surf	midden	1	canid	ulna prox	R		n		3.3	
2		surf	midden	1	deer	hum dist	L		n	cuts	22.1	spir frac
2		surf	midden	1	deer	ulnar notch	L		n	cuts	6.7	"14"
2		surf	midden	1	deer	mand frg	L		n	tool	22.7	ground, polished
2		surf	midden	1	deer	antler base frg			b		5.7	
2		surf	midden	1	deer	antler tip			n		3.6	
2		surf	midden	1	deer	calcaneus	R		n		22.9	
2		surf	midden	1	deer	max t'row	L		n		3.9	inc 2 teeth; "14"
2		surf	midden	1	deer	mtcar dist			n		28.8	spir frac
2		surf	midden	1	deer	mtcar prox ant	L		n		11.2	longitud split
2		surf	midden	1	deer	mttar dist			n		14.3	spir frac
2		surf	midden	1	deer	mttar shft			n		6.1	spir frac
2		surf	midden	1	deer	PM2 up	R		n		1.3	
2		surf	midden	1	deer	pm3 up	L	6 mo	n		0	approx age; "14"
2		surf	midden	1	deer	pm4 up	L	6 mo	n		0	approx age; "14"
2		surf	midden	1	deer	rad dist	R		n		25.4	spir frac
2		surf	midden	1	deer	ulna prox	L		n		11.2	
2		surf	midden	1	drum	otolith	L		n		0.4	L=1.3cmW=.9
2		surf	midden	1	drum	otolith	R		n		3.1	L=2.4cmW=1.7
2		surf	midden	1	squirrel	incisor up	R		n		0.2	hi-polish
2		surf	midden	1	turkey	fib prox	L		n		0.4	
2		surf	midden	1	turkey	tbt shft	R		n		16	"8"
2		surf	midden	1	unid	unid			n	awl (sharp)	0.4	polish; exped tool?
2		surf	midden	3	deer	tooth frg			n		2.8	
3		surf	midden	1	box turtle	hyoplastron frg			n		0.8	
3		surf	midden	1	box turtle	plastron frg			n		0.2	
3		surf	midden	1	c'tail	ilium frg	R		n		0.3	
3		surf	midden	1	c'tail	M1 lo	L		n		0	in socket

3		surf	midden	1	c'tail	M2 lo	L		n		0	in socket
3		surf	midden	1	c'tail	mand t'row	L		n		1	
3		surf	midden	1	c'tail	PM4 lo	L		n		0	in socket
3		surf	midden	1	canid	hum dist	L		n		2	
3		surf	midden	1	canid	hum shft frg	L		n		1	
3		surf	midden	1	canid	PM4 up frg	L		n		1.2	
3		surf	midden	1	canid	scap head frg	R		n		0.6	
3		surf	midden	1	canid	thoracic	A		n		0.9	
3		surf	midden	1	canid	tooth frg			n		0.3	
3		surf	midden	1	deer	astrag frg			b		0.7	
3		surf	midden	1	deer	calc dist ant lat frg	L		b		0.8	
3		surf	midden	1	deer	mtpod dx condyle		imm	b		2	
3		surf	midden	1	deer	mtpod shft frg			b		0.3	
3		surf	midden	1	deer	petrous frg			b		1.8	
3		surf	midden	1	deer	phx1 dist			b		2.5	
3		surf	midden	1	deer	phx1 dist frg	L		b		0.7	
3		surf	midden	1	deer	astragalus	R		n		16.3	
3		surf	midden	1	deer	mtpod shft frg			n		1.7	
3		surf	midden	1	deer	rad shft frg			n		3.2	sp frac
3		surf	midden	1	jack/swamp	hum prox	L		n		1.3	
3		surf	midden	1	jack/swamp	vert	A	imm	n		0.9	
3		surf	midden	1	pocket gopl	frontal	A		n		0.1	
3		surf	midden	1	pocket gopl	hum dist	L		n		0.1	
3		surf	midden	1	pocket gopl	incisor lo	R		n		0	in socket
3		surf	midden	1	pocket gopl	mandible	R		n		0.6	
3		surf	midden	1	pocket gopl	PM4 lo	R		n		0	in socket
3		surf	midden	1	raccoon	PM2 up	R		n		0.5	in max frg
3		surf	midden	1	turkey	sternum frg			n		1.7	
3		surf	midden	1	turtle	shell frg			b		0.4	
3		surf	midden	1	turtle	shell frg			n		0.5	
3		surf	midden	2	box turtle	peripheral			n		2.9	
3		surf	midden	2	pocket gopl	tooth unid			n		0.05	
4		surf	midden	1	deer	mtpod shft frg			b		1.8	sp frac
4		surf	midden	1	turtle	shell frg			b		0.5	
5		surf	midden	1	bovid	rib shft frg			b		11.6	
5		surf	midden	1	box turtle	hyoplastron frg			b		1	
6		surf	midden	1	armadillo	innominate	R		n		7.7	
6		surf	midden	1	box turtle	hyoplastron	L		n		1	
6		surf	midden	1	deer	scap	R		n		23.5	
6		surf	midden	1	jack/swamp	max t'row	R		n		2.1	
6		surf	midden	1	jack/swamp	PM3 up	R		n		0	in socket
6		surf	midden	1	jack/swamp	PM4 up	R		n		0	in socket

7	surf	midden	1	box turtle	hypoplastron	R	b		0.8	
7	surf	midden	1	c'tail	fem shft frg	L	b		0.8	
7	surf	midden	1	deer	mttar shft frg		b		1.1	sp frac
7	surf	midden	1	raccoon	scap head	L	n		0.9	
7	surf	midden	1	turkey	tbt shft frg	L	n		2.5	dist area
8	surf	midden	1	bovid	mtcar shft frg		n		5.7	
8	surf	midden	1	box turtle	peripheral		n		0.8	
8	surf	midden	1	box turtle	pleural		n		0.8	
8	surf	midden	1	c'tail	diastema	L	n		0.2	
8	surf	midden	1	c'tail	incisor lo frg	L	n		0.05	
8	surf	midden	1	catfish	vert	A	n		0.6	
8	surf	midden	1	deer	antler frg		b		0.8	
8	surf	midden	1	deer	mtpod shft frg		b		1	
8	surf	midden	1	deer	mttar shft frg		n		0.9	sp frac
8	surf	midden	1	turkey	rad dist	R	n		2.4	
8	surf	midden	1	turtle	shell frg		b		0.3	
8	surf	midden	2	box turtle	peripheral		b		1	
8	surf	midden	2	deer	antler frg		n		2.3	
9	surf	midden	1	box turtle	hyoplastron frg	L	n		0.7	
9	surf	midden	1	box turtle	peripheral		n		0.8	
9	surf	midden	1	canid	acetabulum	L	n		3.2	
9	surf	midden	1	canid	fem prox	L	n		4.8	
9	surf	midden	1	canid	fib dist	R	n		0.2	
9	surf	midden	1	canid	hum prox	L	n		5.2	
9	surf	midden	1	canid	humerus	R	n		10.6	
9	surf	midden	1	canid	ilium	R	n		3.5	
9	surf	midden	1	canid	Mt2	R	n		0.8	
9	surf	midden	1	canid	Mt3	R	n		0.9	
9	surf	midden	1	canid	Mt4	R	n		1	
9	surf	midden	1	canid	Mt5 prox	R	n		0.7	
9	surf	midden	1	canid	rad shft	R	n		4.4	
9	surf	midden	1	canid	radius	L	n		5	
9	surf	midden	1	canid	scap blade frg	L	n		0.4	
9	surf	midden	1	canid	scap head	L	n		1.2	
9	surf	midden	1	canid	tibia	L	n		10.4	
9	surf	midden	1	canid	tibia	R	n		8.8	
9	surf	midden	1	canid	vert	A	n		2	
9	surf	midden	1	canid	vert centrum frg	A	n		0.9	
9	surf	midden	1	canid	zygo frg		n		1	
9	surf	midden	1	deer	mtpod prox frg		b		1	
9	surf	midden	1	deer	phx3	L	b		2.4	
9	surf	midden	1	deer	antler frg		n		0.9	

9		surf	midden	1	deer	petrous frg	R		n		1.7	
9		surf	midden	1	deer	tib shft frg			n		7.4	sp frac
9		surf	midden	2	canid	phx			n		0.7	
9		surf	midden	2	deer	antler frg			b		1	
9		surf	midden	2	deer	tooth frg			n		1.5	
9		surf	midden	2	turtle	shell frg			n		1.5	
9		surf	midden	7	deer	mtpod shft frg			b		7.2	
10		surf	midden	1	canid	atlas	A		n		4.2	
10		surf	midden	1	canid	bulla	L		n		1.1	
10		surf	midden	1	canid	bulla	R		n		0.2	
10		surf	midden	1	canid	C lo	R		n		0	in socket
10		surf	midden	1	canid	C up	L		n		0	in socket
10		surf	midden	1	canid	frontal	A		n		3.6	
10		surf	midden	1	canid	M1 lo	L		n		0	in socket
10		surf	midden	1	canid	M1 lo	R		n		0	in socket
10		surf	midden	1	canid	M1 up	L		n		0	in socket
10		surf	midden	1	canid	M1 up	R		n		0	in socket
10		surf	midden	1	canid	M2 lo	L		n		0	in socket
10		surf	midden	1	canid	M2 lo	R		n		0	in socket
10		surf	midden	1	canid	mand t'row	L		n		13.3	
10		surf	midden	1	canid	mandible t'row	R		n		15.3	
10		surf	midden	1	canid	max t'row	L		n		4.2	
10		surf	midden	1	canid	max t'row	R		n		4.6	
10		surf	midden	1	canid	occip condyle	L		n		1.2	
10		surf	midden	1	canid	occip condyle	R		n		0.8	
10		surf	midden	1	canid	petrous	L		n		1	
10		surf	midden	1	canid	petrous	R		n		3.5	
10		surf	midden	1	canid	PM2 lo	R		n		0	in socket
10		surf	midden	1	canid	PM3 lo	L		n		0	in socket
10		surf	midden	1	canid	PM3 lo	R		n		0	in socket
10		surf	midden	1	canid	PM4 lo	L		n		0	in socket
10		surf	midden	1	canid	PM4 lo	R		n		0	in socket
10		surf	midden	1	canid	PM4 up	L		n		0	in socket
10		surf	midden	1	canid	PM4 up	R		n		0	in socket
10		surf	midden	1	canid	premax	L		n		2.2	
10		surf	midden	1	canid	squamosal	L		n		1.6	
10		surf	midden	1	canid	vert	A		n		2.6	
10		surf	midden	3	canid	incisor unid			n		0.6	
10		surf	midden	4	canid	cran frg			n		4.9	
11		surf	midden	1	bovid	rib shft			n		12.8	
11		surf	midden	1	box turtle	plastron frg			b		0.4	
11		surf	midden	1	box turtle	peripheral	R		n		0.6	"bridge"

11		surf	midden	1	box turtle	peripheral			n		1.4	
11		surf	midden	1	box turtle	xiphiplastron frg	L		n		1.3	
11		surf	midden	1	c'tail	M1 lo	L		n		0	in socket
11		surf	midden	1	c'tail	M2 lo	L		n		0	in socket
11		surf	midden	1	c'tail	mand t'row	L		n		1.2	
11		surf	midden	1	c'tail	PM4 lo	L		n		0	in socket
11		surf	midden	1	canid	M1 lo	L		n		1	
11		surf	midden	1	canid	vert	A		n		1.8	
11		surf	midden	1	deer	mtpod dist condyle			b		1.2	
11		surf	midden	1	deer	mtpod shft frg			b		0.5	
11		surf	midden	1	deer	mtcar shft frg			n		5.2	sp frac
11		surf	midden	1	deer	mttar shft frg			n		15	sp frac
11		surf	midden	1	raccoon	hum shft	R		n		3.9	
11		surf	midden	1	raccoon	M1 lo	L		n		0	in socket
11		surf	midden	1	raccoon	M2 lo	L		n		0	in socket
11		surf	midden	1	raccoon	mand t'row	L		n		4.2	
11		surf	midden	1	raccoon	PM4 lo	L		n		0	in socket
11		surf	midden	1	turkey	phx			n		0.7	
11		surf	midden	1	turtle	shell frg			n		0.4	
11		surf	midden	2	deer	tib shft frg			n		13.4	sp frac
11		surf	midden	2	turtle	shell frg			b		2.1	
11		surf	midden	3	armadillo	pelvis frg			n		8.8	
12		surf	midden	1	bovid	sternum frg	A		n		10.3	
12		surf	midden	1	box turtle	peripheral frg			b		0.3	
12		surf	midden	1	box turtle	hyoplast+ento	A		n		7.2	
12		surf	midden	1	box turtle	peripheral frg			n		0.4	
12		surf	midden	1	box turtle	xiphiplastron frg	L		n		0.8	
12		surf	midden	1	c'tail	calc prox	L		b		0.3	
12		surf	midden	1	canid	astragalus	L		n		0.7	sm indiv
12		surf	midden	1	canid	fem dist	L		n		5.7	
12		surf	midden	1	canid	fem dist	L		n		2.8	
12		surf	midden	1	canid	fem dist	R		n		8.4	
12		surf	midden	1	canid	hum dist	L		n		4.3	
12		surf	midden	1	deer	mtpod dx frg		imm	b		1.7	
12		surf	midden	1	deer	mttar prox frg	L		b		1	
12		surf	midden	1	deer	axis	A		n		21.6	
12		surf	midden	1	deer	hum shft frg	L		n		2.5	
12		surf	midden	1	deer	mtcar prox ant	L		n		14.3	sp frac
12		surf	midden	1	deer	mtpod shft frg			n		2	
12		surf	midden	1	deer	tooth frg			n		0.4	
12		surf	midden	1	jack/swamp	mand t'row	R		b		1	
12		surf	midden	1	jack/swamp	M2 lo	R		n		0	in socket

12		surf	midden	1	jack/swamp	M3 lo	R		n		0	in socket
12		surf	midden	1	lg mam	unid			n	awl (dull)	2.4	
12		surf	midden	1	pocket gopl	incisor lo	L		n		0	in socket
12		surf	midden	1	pocket gopl	mandible	L		n		0.6	
12		surf	midden	1	squirrel	hum dist	L		b		0.3	
12		surf	midden	1	turkey	ulna shft			n		6.7	
12		surf	midden	1	turtle	shell frg			b		0.1	
12		surf	midden	2	canid	vert	A		n		3.1	
12		surf	midden	2	turtle	shell frg			n		1	
13		surf 03	midden	1	box turtle	hyoplastron	R		n		1.4	
13		surf 03	midden	2	box turtle	peripheral			b		2	
14	3	surf	midden	1	box turtle	hypoplastron	R		n		2.6	
14	3	surf	midden	1	deer	mttar shft frg			n	cuts	3.4	sp frac; trans cuts
14	3	surf	midden	1	deer	phx1 prox	L		b		2.1	
14	3	surf	midden	1	turkey	scap prox	R		n		1.8	
14	3	surf	midden	1	turtle	shell frg			n		0.2	
14	3	surf	midden	2	deer	antler frg			n		4	
15	4	surf	midden	1	box turtle	peripheral			b		0.4	
15	4	surf	midden	1	box turtle	epiplastron	R		n		0.9	
15	4	surf	midden	1	box turtle	plastron frg			n		0.4	
15	4	surf	midden	1	c'tail	fem prox	R		n		1.2	
15	4	surf	midden	1	canid	ilium frg	R		n		1.9	
15	4	surf	midden	1	catfish	vert frg	A		n		2	v.lg indiv
15	4	surf	midden	1	deer	antler frg			b		1.5	
15	4	surf	midden	1	deer	hum dist frg			b		2.4	
15	4	surf	midden	1	deer	rad prox med frg	L		b		3	
15	4	surf	midden	1	deer	antler frg			n		1.7	
15	4	surf	midden	1	deer	phx1 dist	L		n		2.3	
15	4	surf	midden	1	rabbit	vert	A		b		0.6	
15	4	surf	midden	1	squirrel	mand condyle	L		n		0.2	
15	4	surf	midden	1	turkey	hum prox	L		n		1.4	
15	4	surf	midden	2	box turtle	peripheral			n		1.4	
15	4	surf	midden	2	deer	mtpod dist condyle			b		3.1	
15	4	surf	midden	2	deer	mtpod shft frg			b		2.3	
15	4	surf	midden	3	turtle	shell frg			n		1	
16	5	surf	midden	1	box turtle	peripheral			b		0.7	
16	5	surf	midden	1	box turtle	peripheral frg	L		b		0.5	"bridge"
16	5	surf	midden	1	box turtle	hyoplastron	R		n		1.3	
16	5	surf	midden	1	box turtle	hyoplastron	R		n		1.7	
16	5	surf	midden	1	box turtle	peripheral	L		n		0.9	"bridge"
16	5	surf	midden	1	box turtle	plastron frg			n		0.7	
16	5	surf	midden	1	canid	C up	R		n		1.3	open root

16	5	surf	midden	1	canid	incisor			n		0.3	
16	5	surf	midden	1	canid	Mc1 prox	L		n		0.6	
16	5	surf	midden	1	canid	mtpod dist			n		0.3	
16	5	surf	midden	1	canid	phx			n		0.4	
16	5	surf	midden	1	cougar	rad prox	R		n		41.3	almost complete
16	5	surf	midden	1	deer	mtpod dist condyle frg			b		1.8	
16	5	surf	midden	1	deer	phx1 dist frg	R		b		0.8	
16	5	surf	midden	1	deer	fem shft frg			n		6.9	sp frac
16	5	surf	midden	1	deer	mtpod dx condyle frg		imm	n		2	
16	5	surf	midden	1	deer	phx1 dist frg			n		1.2	
16	5	surf	midden	1	deer	rad dist	L		n		17.8	sp frac
16	5	surf	midden	1	deer	tooth frg			n		0.3	
16	5	surf	midden	1	lg mam	unid			n	awl (dull)	0.8	
16	5	surf	midden	1	turkey	tbt dist	L		b		3.2	
16	5	surf	midden	1	turkey	vert	A		n		0.7	
16	5	surf	midden	2	box turtle	peripheral			n		2.5	
16	5	surf	midden	2	deer	antler frg			b		1.7	
16	5	surf	midden	2	deer	mtpod shft frg			b		2.3	
16	5	surf	midden	2	deer	antler frg			n		2.3	
16	5	surf	midden	3	turtle	shell frg			n		1.3	
16	5	surf	midden	4	turtle	shell frg			b		2.9	
17	6	surf	midden	1	bovid	incisor			n	drilled	2.5	incomp hole
17	6	surf	midden	1	bovid	sesamoid			b		5.5	
17	6	surf	midden	1	box turtle	hyoplastron	L		n		1.8	
17	6	surf	midden	1	c'tail	tib shft	R		b		0.9	
17	6	surf	midden	1	c'tail	fem prox	R		n		0.8	
17	6	surf	midden	1	canid	astrag frg	R		n		0.7	
17	6	surf	midden	1	canid	astragalus	L		n		1.4	
17	6	surf	midden	1	deer	antler frg			b		1.6	
17	6	surf	midden	1	deer	mtpod shft frg			b		3.3	sp frac
17	6	surf	midden	1	deer	rad dist frg	L		b		1.6	
17	6	surf	midden	1	deer	mtpod prox frg			n		3.4	sp frac
17	6	surf	midden	1	deer	rad dist frg	R		n		2.7	
17	6	surf	midden	1	deer	rad shft frg			n		3	sp frac
17	6	surf	midden	1	deer	ulnar notch	R		n		2.7	
17	6	surf	midden	1	lg snake	vert	A		n		1.1	spur broken
17	6	surf	midden	1	pocket gopl	acetabulum	L		n		0.1	
17	6	surf	midden	1	pocket gopl	mand frg	R		n		0.1	diastema
17	6	surf	midden	1	pocket gopl	sacrum	A		n		0.2	
17	6	surf	midden	1	pocket gopl	tibia	L		n		0.1	
17	6	surf	midden	1	rabbit	vert	A		n		1.2	
17	6	surf	midden	1	turtle	shell frg			b		0.3	

17	6	surf	midden	2	deer	antler frg			n		3.2	
17	6	surf	midden	2	deer	mttar shft frg			n		2.6	sp frac
17	6	surf	midden	2	turtle	shell frg			n		0.6	
17	6	surf	midden	5	box turtle	peripheral			b		2.5	
18	7	surf	midden	1	box turtle	peripheral			n		0.7	
18	7	surf	midden	1	box turtle	xiphiplastron	R		n		2.6	
18	7	surf	midden	1	canid	astrag frg	L		n		0.5	almost complete
18	7	surf	midden	1	canid	m1 up	R	imm	n		0.7	open roots
18	7	surf	midden	1	canid	Mc1 prox	L		n		0.4	
18	7	surf	midden	1	canid	phx			n		0.4	
18	7	surf	midden	1	canid	squamosal	L		n		0.9	
18	7	surf	midden	1	cougar	scap head	L		n		22.5	
18	7	surf	midden	1	cougar	tib shft			n		9.4	sp frac
18	7	surf	midden	1	deer	calc px	L	imm	b		4	
18	7	surf	midden	1	deer	fem shft frg			b		1.9	sp frac
18	7	surf	midden	1	deer	mtpod shft frg			b		3.1	sp frac
18	7	surf	midden	1	deer	mttar prox ant frg	R		b		3.3	sp frac
18	7	surf	midden	1	deer	phx dist frg			b		0.9	
18	7	surf	midden	1	deer	phx1	R		b		7.4	
18	7	surf	midden	1	deer	phx3 prox	R		b		1.6	
18	7	surf	midden	1	deer	ulnar notch	L		b		2.2	
18	7	surf	midden	1	deer	antler frg			n		1.5	
18	7	surf	midden	1	deer	phx1 prox	L		n		1.5	
18	7	surf	midden	1	deer	phx2 frg	L		n		1.7	
18	7	surf	midden	1	deer	phx3	L		n		3.1	
18	7	surf	midden	1	jack/swamp	hum prox	L		b		0.5	
18	7	surf	midden	1	jack/swamp	calcaneus	R		n		0.8	
18	7	surf	midden	1	pig	incisor			n		2.2	
18	7	surf	midden	1	pocket gopl	cranium	A		n		0.9	
18	7	surf	midden	1	pocket gopl	incisor lo	L		n		0	in socket
18	7	surf	midden	1	pocket gopl	incisor lo	R		n		0	in socket
18	7	surf	midden	1	pocket gopl	incisor up	L		n		0	in socket
18	7	surf	midden	1	pocket gopl	incisor up	R		n		0	in socket
18	7	surf	midden	1	pocket gopl	mandible	L		n		0.4	
18	7	surf	midden	1	pocket gopl	mandible	R		n		0.4	
18	7	surf	midden	1	rabbit	incisor lo frg	R		n		0.05	
18	7	surf	midden	1	raccoon	mand frg	R		b		4.7	
18	7	surf	midden	1	softshell tur	shell frg			n		1.5	
18	7	surf	midden	1	squirrel	fem prox	R		n		0.5	
18	7	surf	midden	1	turkey	tmt spur			b		1	
18	7	surf	midden	1	turkey	tmt shft	L		n		12.8	
18	7	surf	midden	1	unid	unid			n	awl (sharp)	1	

18	7	surf	midden	2	box turtle	peripheral			b		1.3	
18	7	surf	midden	2	deer	mtpod shft frg			n		18.1	sp frac
18	7	surf	midden	5	turtle	shell frg			n		2	
19	8	surf	midden	1	box turtle	hypoplastron frg	R		n		1.2	
19	8	surf	midden	1	box turtle	peripheral			n		0.4	
19	8	surf	midden	1	box turtle	plastron frg			n		0.7	
19	8	surf	midden	1	c'tail	fem px	R	imm	n		0.9	
19	8	surf	midden	1	canid	astragalus	R		n		1.4	
19	8	surf	midden	1	canid	carpal	L		n		0.4	
19	8	surf	midden	1	canid	hum	L	imm	n		1.3	no epiph;neonatal
19	8	surf	midden	1	canid	m1 up	R	imm	n		0	in socket
19	8	surf	midden	1	canid	max t'row	R	imm	n		0.9	
19	8	surf	midden	1	canid	pm4 up	R	imm	n		0	in socket
19	8	surf	midden	1	deer	phx prox frg			b		0.5	
19	8	surf	midden	1	deer	sesamoid			b		0.4	
19	8	surf	midden	1	deer	ascend ramus frg			n		0.5	
19	8	surf	midden	1	deer	mtpod shft frg			n		1.4	
19	8	surf	midden	1	deer	phx1	R		n		6.3	
19	8	surf	midden	1	deer	rad shft			n		1.9	sp frac
19	8	surf	midden	1	jack/swamp	incisor lo	R		n		0	in socket
19	8	surf	midden	1	jack/swamp	mand frg	R		n		1.8	diastema
19	8	surf	midden	1	turtle	shell frg			b		0.3	
19	8	surf	midden	2	box turtle	peripheral			b		1.2	
19	8	surf	midden	2	deer	mtpod prox frg			b		2	sp frac
19	8	surf	midden	2	deer	antler frg			n		1.1	
19	8	surf	midden	2	deer	mtpod shft frg			n		7	sp frac
19	8	surf	midden	2	lg snake	vert	A		n		2.5	spur broken
19	8	surf	midden	3	turtle	shell frg			n		1.3	
19	8	surf	midden	5	deer	antler frg			b		4	
19	8	surf	midden	5	rabbit	tooth frg			n		0.4	prob jack/swamp
20	9	surf	midden	1	box turtle	hyoplastron	R		n		1.4	
20	9	surf	midden	1	box turtle	hypoplastron	L		n		1.9	
20	9	surf	midden	1	box turtle	hypoplastron frg	L		n		0.7	
20	9	surf	midden	1	deer	antler frg			b		0.6	
20	9	surf	midden	1	deer	phx2 dist	R		b		0.8	
20	9	surf	midden	1	deer	acetab frg	L		n		4.4	
20	9	surf	midden	1	deer	mtpod dist			n		10.9	
20	9	surf	midden	1	deer	mtpod shft frg			n		1.1	sp frac
20	9	surf	midden	1	deer	nav-cub	R		n		6.1	
20	9	surf	midden	1	deer	phx			n		2.1	v. abraded,exfol
20	9	surf	midden	1	deer	phx2	L		n		3.6	
20	9	surf	midden	1	deer	tib shft frg			n		7	sp frac

20	9	surf	midden	1	jack/swamp	incisor lo frg	L		n		0	in socket
20	9	surf	midden	1	jack/swamp	mand diastema	L		n		0.7	
20	9	surf	midden	1	jack/swamp	tib dist	R		n		0.7	
20	9	surf	midden	1	lg snake	vert	A		n		1.2	spur broken
20	9	surf	midden	1	pocket gopl	cranium	A		n		1.1	
20	9	surf	midden	1	pocket gopl	incisor up	L		n		0	in socket
20	9	surf	midden	1	pocket gopl	incisor up	R		n		0	in socket
20	9	surf	midden	1	raccoon	M1 lo	L		n		0	in socket
20	9	surf	midden	1	raccoon	M2 lo	L		n		0	in socket
20	9	surf	midden	1	raccoon	mand t'row	L		n		5.2	
20	9	surf	midden	1	raccoon	PM2 lo	L		n		0	in socket
20	9	surf	midden	1	raccoon	PM3 lo	L		n		0	in socket
20	9	surf	midden	1	raccoon	PM4 lo	L		n		0	in socket
20	9	surf	midden	1	squirrel	ilium	R		n		0.3	
20	9	surf	midden	3	box turtle	peripheral			n		3.8	
20	9	surf	midden	4	box turtle	shell frg			n		3.1	
21	11	surf	midden	1	c'tail	acetabulum	L		b		0.3	
21	11	surf	midden	1	jack/swamp	fem dist	R		n		1.4	
22	12	surf	midden	1	box turtle	peripheral frg			n		0.4	
22	12	surf	midden	1	box turtle	pleural frg			n		0.9	
22	12	surf	midden	1	c'tail	jugal	R		n		0.3	
22	12	surf	midden	1	deer	ilium frg	R		n		9.5	
22	12	surf	midden	1	deer	mtcar prox	R		n		12.8	sp frac
22	12	surf	midden	1	deer	mtpod dx condyle		imm	n		3.2	
22	12	surf	midden	1	deer	petrous	R		n		2.6	
22	12	surf	midden	1	deer	podial unid	L		n		1.6	v. abraded+exfol
22	12	surf	midden	1	pocket gopl	fem shft	R	imm	n		0.1	
22	12	surf	midden	1	pocket gopl	scapula	R		n		0.1	
22	12	surf	midden	1	turtle	shell frg			b		0.2	
22	12	surf	midden	3	deer	antler frg			b		1.7	
23	14	surf	midden	1	c'tail	vert	A	imm	n		0.3	
23	14	surf	midden	1	deer	mtpod shft frg			b		1	sp frac
23	14	surf	midden	1	deer	mtpod shft frg			n		1.3	sp frac
23	14	surf	midden	1	deer	phx prox frg			n		0.7	
23	14	surf	midden	1	deer	PM2 up	L		n		1.6	in max frg
23	14	surf	midden	1	jack/swamp	acetabulum	L		n		1.6	
23	14	surf	midden	1	jack/swamp	tib prox	R		n		1	
23	14	surf	midden	1	jack/swamp	ulna prox	L		n		0.6	
23	14	surf	midden	1	turkey	sternum frg	A		n		2.2	
23	14	surf	midden	1	turkey	tmt shft			n		1.6	
24	15	surf	midden	1	box turtle	hypoplastron	L		n		2.4	
24	15	surf	midden	1	box turtle	peripheral frg	R		n		0.6	"bridge"

24	15	surf	midden	1	box turtle	pleural			n		1.1	
24	15	surf	midden	1	box turtle	pleural frg			n		0.6	
24	15	surf	midden	1	box turtle	xiphiplastron	R		n		2.4	
24	15	surf	midden	1	box turtle	xiphiplastron frg	L		n		1.2	
24	15	surf	midden	1	canid	M1 lo	L		n		1.4	
24	15	surf	midden	1	canid	tib dist	L		n		2	
24	15	surf	midden	1	deer	acetab frg	L		b		8.1	
24	15	surf	midden	1	deer	nav-cub	L		b		6.8	
24	15	surf	midden	1	deer	phx2	R		b		2.8	
24	15	surf	midden	1	deer	antler tip			n		4.8	
24	15	surf	midden	1	deer	fem frg (process)	R		n		4	sp frac
24	15	surf	midden	1	deer	fem shft frg			n		5.4	sp frac
24	15	surf	midden	1	deer	fem shft frg (m.scar)	R		n		5.3	sp frac
24	15	surf	midden	1	deer	mtpod shft frg			n		9	sp frac
24	15	surf	midden	1	deer	mttar prox ant	R		n		11.2	sp frac
24	15	surf	midden	1	deer	phx1 dist	R		n		1.2	
24	15	surf	midden	1	deer	phx3	R		n		2.1	
24	15	surf	midden	1	deer	PM3 up	L		n		1.6	ave wear
24	15	surf	midden	1	lg mam	unid			b	blunt	1.3	poss rib frg
24	15	surf	midden	1	pocket gopl	sacrum	A		n		0.2	
24	15	surf	midden	1	turkey	digit			n		0.4	
24	15	surf	midden	1	turkey	tmt shft	L		n		2	
24	15	surf	midden	2	deer	antler frg			n		8.9	v.abraded+exfol
25	16	surf	midden	1	canid	fem dx frg		imm	n		1.4	
25	16	surf	midden	1	canid	M1 lo	L		n		1.6	
25	16	surf	midden	1	canid	M1 lo frg	L		n		0.8	
25	16	surf	midden	1	canid	M2 lo	L		n		0.3	
25	16	surf	midden	1	canid	mand frg	L		n		5.5	
25	16	surf	midden	1	deer	ulnar notch	L		n	awl (dull)	3.3	
25	16	surf	midden	1	deer	phx1 dist	R		b		2.1	
25	16	surf	midden	1	deer	astragalus	R		n		14.7	
25	16	surf	midden	1	deer	mtcar shft frg			n		7.8	sp frac
25	16	surf	midden	1	deer	phx2 frg	L		n		2.2	sp frac
25	16	surf	midden	1	jack/swamp	max t'row	R		b		1.1	
25	16	surf	midden	1	jack/swamp	PM2 up	R		b		0	in socket
25	16	surf	midden	1	jack/swamp	PM3 up	R		b		0	in socket
25	16	surf	midden	1	jack/swamp	hum shft	L		n		2.2	
25	16	surf	midden	1	turkey	coracoid shft	R		n		6.1	
25	16	surf	midden	1	turkey	fib prox	L		n		1.1	
25	16	surf	midden	1	turkey	tmt dist	L		n		1.5	
26	17	surf	midden	1	box turtle	hypoplastron	R		n		5.3	
26	17	surf	midden	1	c'tail	acetab frg	R		n		0.4	

26	17	surf	midden	1	c'tail	scap head	L		n	0.5	
26	17	surf	midden	1	deer	antler frg			b	0.9	
26	17	surf	midden	1	deer	mtpod shft frg			b	1.4	
26	17	surf	midden	1	deer	phx1 prox	R		b	2.8	sp frac
26	17	surf	midden	1	deer	acetabulum	R		n	36.6	
26	17	surf	midden	1	deer	mtpod shft frg			n	10.4	sp frac
26	17	surf	midden	1	deer	rad shft			n	14.6	sp frac
26	17	surf	midden	1	deer	vert facet			n	2.8	
26	17	surf	midden	1	jack/swamp	hum shft frg	R		b	0.3	
26	17	surf	midden	1	opossum	ilium frg	R		n	1.8	
26	17	surf	midden	1	opossum	scap head	L		n	0.5	
26	17	surf	midden	1	squirrel	hum prox	R		n	0.4	
26	17	surf	midden	1	turkey	coracoid dist	R		n	1	
26	17	surf	midden	1	turkey	hum shft	L		n	11.9	
26	17	surf	midden	1	turtle	shell frg			b	0.2	
26	17	surf	midden	2	deer	antler frg			n	0.8	
26	17	surf	midden	3	turtle	shell frg			n	1.4	
27	18	surf	midden	1	bovid	phx frg		imm	n	1.9	
27	18	surf	midden	1	box turtle	peripheral			n	0.3	
27	18	surf	midden	1	canid	mtpod dist			n	0.4	
27	18	surf	midden	1	canid	petrous	R		n	0.8	
27	18	surf	midden	1	canid	PM2 up	L		n	0.4	
27	18	surf	midden	1	deer	astrag frg	R		b	6.1	
27	18	surf	midden	1	deer	phx1 prox frg	R		b	1	sp frac
27	18	surf	midden	1	deer	podial frg			b	0.8	
27	18	surf	midden	1	deer	patella	R		n	6	
27	18	surf	midden	1	jack/swamp	acetab frg	L		n	0.9	
27	18	surf	midden	1	turkey	tbt prox frg	L		b	2.2	
27	18	surf	midden	1	turkey	tbt shft			n	2	
27	18	surf	midden	1	turtle	shell frg			n	0.1	
27	18	surf	midden	2	box turtle	peripheral			b	1.1	
27	18	surf	midden	2	box turtle	shell frg			b	0.7	
28	18	surf	midden	1	canid	calc prox	R		n	2.5	
28	18	surf	midden	1	canid	M2 lo	R		n	0	in socket
28	18	surf	midden	1	canid	mand frg	R		n	2.8	
28	18	surf	midden	1	deer	acetab frg			b	3.7	
28	18	surf	midden	1	deer	antler frg			b	2.3	
28	18	surf	midden	1	deer	nav-cub frg	R		b	2.5	
28	18	surf	midden	1	deer	tib shft frg			b	2.6	sp frac
28	18	surf	midden	1	deer	hum prox frg			n	4.4	
28	18	surf	midden	1	deer	ulnar notch	R		n	3	
28	18	surf	midden	1	deer	ulnar notch frg	L		n	1.2	

28	18	surf	midden	1	deer	ulnar notch frg	R		n		1.3	
28	18	surf	midden	1	deer	vert facet			n		2.9	
28	18	surf	midden	1	lg snake	vert	A		n		0.5	spur broken
28	18	surf	midden	1	pocket gopl	incisor lo	R		n		0	in socket
28	18	surf	midden	1	pocket gopl	mandible	R		n		0.6	
28	18	surf	midden	1	turkey	coracoid shft frg	R		n		1.1	
28	18	surf	midden	1	turkey	tbt prox	R		n		7.2	
28	18	surf	midden	1	turtle	shell frg			n		0.5	
29	18	surf	midden	1	box turtle	peripheral			b		0.4	
29	18	surf	midden	1	box turtle	hyoplastron	R		n		1.1	
29	18	surf	midden	1	canid	scap head	L		n		1.2	
29	18	surf	midden	1	deer	antler frg			b		4.2	
29	18	surf	midden	1	deer	mttar prox post frg	L		b		2.3	sp frac
29	18	surf	midden	1	deer	phx1 dist frg	R		b		1.1	
29	18	surf	midden	1	deer	mtpod dx condyle		imm	n		3.2	
29	18	surf	midden	1	deer	mtpod shft frg			n		2.6	sp frac
29	18	surf	midden	1	deer	nav-cub	L		n		6.8	
29	18	surf	midden	1	deer	phx1 prox	R		n		2.9	sp frac
29	18	surf	midden	1	deer	podial unid	R		n		1.5	
29	18	surf	midden	1	deer	scap neck frg			n		2.7	
29	18	surf	midden	1	lg viperidae	vert	A		n		1.3	long spur
29	18	surf	midden	1	pocket gopl	mandible	R		n		0.5	
29	18	surf	midden	1	turkey	tbt prox	R		n		1.7	
29	18	surf	midden	2	box turtle	plastron frg			b		2.8	
29	18	surf	midden	2	box turtle	peripheral			n		2.9	
29	18	surf	midden	2	turtle	shell frg			b		1.1	
29	18	surf	midden	3	box turtle	plastron frg			n		1.6	
29	18	surf	midden	6	turtle	shell frg			n		3.4	
30	19	surf	midden	1	box turtle	plastron frg			b		0.6	
30	19	surf	midden	1	deer	phx3 prox	R		b		1.1	
30	19	surf	midden	1	deer	scaphoid frg	R		b		2	
30	19	surf	midden	1	deer	ulnar notch frg	L		b		2.7	
30	19	surf	midden	1	deer	mand frg	L	imm	n		2.7	
30	19	surf	midden	1	deer	mtpod shft frg			n		4.4	sp frac
30	19	surf	midden	1	deer	petrous	L		n		1	prob imm: v. sm.
30	19	surf	midden	1	deer	pm2 lo	L	imm	n		0	unerupted
30	19	surf	midden	1	deer	pm3 lo	L	imm	n		0	unerupted
30	19	surf	midden	1	turkey	fem shft frg			n		1.1	
30	19	surf	midden	2	deer	antler frg			b		1.7	
30	19	surf	midden	2	deer	mtpod shft frg			b		6.9	sp frac
30	19	surf	midden	2	turtle	shell frg			n		1.4	
31	20	surf	midden	1	deer	antler frg			b		1.9	

32	22	surf	midden	1	box turtle	innominate	L		n		0.5	
32	22	surf	midden	1	deer	ascend ramus	L		n		1.6	
32	22	surf	midden	1	deer	mtpod shft frg			n		1.9	sp frac
32	22	surf	midden	1	deer	phx3	R		n		0.9	
32	22	surf	midden	1	deer	rad dist	L		n		9.2	
32	22	surf	midden	1	deer	ulna prox	L		n		6.8	
32	22	surf	midden	2	box turtle	peripheral			b		0.8	
32	22	surf	midden	2	lg snake	vert	A		n		2.2	spur broken
32	22	surf	midden	2	turtle	shell frg			b		1	
33	23	surf	midden	1	box turtle	peripheral			n		1.7	
33	23	surf	midden	1	c'tail	fem dist	R		n		0.7	
33	23	surf	midden	1	c'tail	fem dist	R		n		0.5	
33	23	surf	midden	1	canid	astragalus	R		n		1.3	
33	23	surf	midden	1	canid	C lo	L		n		1.2	
33	23	surf	midden	1	canid	fem px	R	imm	n		0.7	
33	23	surf	midden	1	canid	hum px	L	imm	n		0.3	
33	23	surf	midden	1	canid	ilium frg	L		n		1.1	
33	23	surf	midden	1	canid	ilium frg	R	imm	n		1	
33	23	surf	midden	1	canid	max frg	L		n		2.2	
33	23	surf	midden	1	canid	Mc2 prox	L	imm	n		0.2	
33	23	surf	midden	1	canid	Mc3 px	L	imm	n		0.3	
33	23	surf	midden	1	canid	PM4 up	R		n		2.7	in max frg
33	23	surf	midden	1	canid	scap head	R		n		1	
33	23	surf	midden	1	canid	tib px	R	imm	n		2.3	
33	23	surf	midden	1	deer	antler frg			b		15	
33	23	surf	midden	1	deer	mtpod dx condyle		imm	b		1.3	
33	23	surf	midden	1	deer	mttar prox post frg	L		b		5.2	sp frac
33	23	surf	midden	1	deer	nav-cub	L		b		5.6	
33	23	surf	midden	1	deer	nav-cub frg	L		b		3.5	
33	23	surf	midden	1	deer	patella frg			b		6	
33	23	surf	midden	1	deer	ulna dist frg			b		0.9	
33	23	surf	midden	1	deer	mtpod dx condyle		imm	n		2.9	
33	23	surf	midden	1	deer	mtpod shft frg			n		2.6	sp frac
33	23	surf	midden	1	deer	phx2 dist	R		n		0.9	
33	23	surf	midden	1	deer	scaphoid frg	L		n		1.3	
33	23	surf	midden	1	deer	thoracic sp	A		n		3.6	
33	23	surf	midden	1	deer	ulna dist	L		n		1.1	
33	23	surf	midden	1	deer	ulna dist	R		n		1.3	
33	23	surf	midden	1	jack/swamp	M2 lo	L		n		0	in socket
33	23	surf	midden	1	jack/swamp	mand frg	L		n		1.1	
33	23	surf	midden	1	kinosternid	hypoplastron	R		n		0.9	
33	23	surf	midden	1	turkey	fem shft frg			n		1.4	

33	23	surf	midden	3	deer	mtpod shft frg			b		4.6	sp frac
34	24	30to40	midden	1	box turtle	hyoplastron	L		n		1.5	
34	24	30to40	midden	1	canid	acetab frg	R	imm	n		0.5	
34	24	30to40	midden	1	canid	phx			n		0.2	
34	24	30to40	midden	1	deer	max frg	L		n		2.1	sm indiv: imm?
34	24	30to40	midden	1	deer	PM2 up	L		n		0	in socket; imm?
34	24	30to40	midden	1	lg mam	unid			n	blunt frg	0.3	
34	24	30to40	midden	2	deer	antler frg			n		3.6	
35	24	0to10	midden	1	box turtle	peripheral			b		0.3	
35	24	0to10	midden	1	canid	mand condyle	R		n		0.9	
35	24	0to10	midden	1	deer	mand condyle	L		b		1.3	
35	24	0to10	midden	1	deer	mttar prox post frg	L		b		0.7	sp frac
35	24	0to10	midden	1	deer	sesamoid			b		0.5	
35	24	0to10	midden	1	deer	hum shft frg			n		5.8	sp frac
35	24	0to10	midden	1	deer	mtpod shft frg			n		1.3	sp frac
35	24	0to10	midden	1	deer	petrous	R		n		0.8	sm indiv: imm?
35	24	0to10	midden	1	deer	tib shft frg			n		2.5	sp frac
35	24	0to10	midden	1	turtle	shell frg			b		0.4	
35	24	0to10	midden	3	turtle	shell frg			n		1.4	
36	24	10to20	midden	1	canid	acetab frg	L		n		1.4	
36	24	10to20	midden	1	canid	acetab frg	L		n		0.7	
36	24	10to20	midden	1	canid	acetab frg	R		n		2	
36	24	10to20	midden	1	canid	astragalus	L	imm	n		0.4	
36	24	10to20	midden	1	canid	astragalus	L		n		1.1	
36	24	10to20	midden	1	canid	C up	R		n		1.1	
36	24	10to20	midden	1	canid	calcaneus	L	imm	n		0.6	
36	24	10to20	midden	1	canid	fem px	L	imm	n		0.9	
36	24	10to20	midden	1	canid	hum dist	L		n		4.3	
36	24	10to20	midden	1	canid	hum dist	R		n		8.1	
36	24	10to20	midden	1	canid	hum shft	L		n		3.1	
36	24	10to20	midden	1	canid	incisor			n		0.2	
36	24	10to20	midden	1	canid	M1 up	L		n		1	
36	24	10to20	midden	1	canid	M1 up	R		n		1.1	
36	24	10to20	midden	1	canid	mand condyle	L		n		1.9	
36	24	10to20	midden	1	canid	Mc2 prox	L		n		0.1	
36	24	10to20	midden	1	canid	Mc2 prox	L		n		0.4	
36	24	10to20	midden	1	canid	Mc3 prox	L		n		0.4	
36	24	10to20	midden	1	canid	PM2 up	L		n		0.4	
36	24	10to20	midden	1	canid	PM2 up	L		n		0.4	
36	24	10to20	midden	1	canid	rad dx	L		n		2.9	
36	24	10to20	midden	1	canid	scap head	L		n		1	
36	24	10to20	midden	1	canid	scap head	R		n		2.6	

36	24	10to20	midden	1	canid	tib	L	imm	n		9.1	<comp:no px epiph
36	24	10to20	midden	1	canid	tib dist	R		n		7.5	
36	24	10to20	midden	1	canid	ulna prox	R		n		1.6	
36	24	10to20	midden	1	catfish	vert	A		n		0.6	
36	24	10to20	midden	1	deer	antler pedicle			b	tool	7.8	pestle?
36	24	10to20	midden	1	deer	phx2	L		b		3.7	
36	24	10to20	midden	1	deer	antler tip			n		1.4	
36	24	10to20	midden	1	deer	fem shft frg			n		3.8	sp frac
36	24	10to20	midden	1	turkey	tmt shft frg			n		0.7	
36	24	10to20	midden	2	canid	phx			n		0.7	
36	24	10to20	midden	2	deer	antler frg			b		3.4	
37	24	20to30	midden	1	box turtle	hyoplastron	R		n		2	
37	24	20to30	midden	1	box turtle	hypoplastron frg	A		n		0.8	
37	24	20to30	midden	1	box turtle	nuchal frg	A		n		0.6	
37	24	20to30	midden	1	c'tail	innominate	R		n		1.2	
37	24	20to30	midden	1	canid	hum px frg	R	imm	n		1.4	epiph frg
37	24	20to30	midden	1	canid	M2 lo	R		n		0.3	
37	24	20to30	midden	1	canid	Mt2 prox	L		n		0.4	
37	24	20to30	midden	1	canid	phx			n		0.2	
37	24	20to30	midden	1	canid	PM4 up	L		n		1.2	
37	24	20to30	midden	1	canid	pm4 up	L	imm	n		0.2	open roots
37	24	20to30	midden	1	deer	antler frg			b		0.9	
37	24	20to30	midden	1	deer	ilium frg			b		6.4	
37	24	20to30	midden	1	deer	patella frg	R		b		3.1	
37	24	20to30	midden	1	deer	phx1 dx	R	imm	n		2.8	in 2 frgs
37	24	20to30	midden	1	lg mam	unid			b	blunt	1.5	
37	24	20to30	midden	1	turtle	shell frg			b		0.2	
37	24	20to30	midden	1	turtle	shell frg			n		0.8	
38	25	surf	midden	1	c'tail	tib prox	R		n		0.4	
38	25	surf	midden	1	deer	fem shft frg			n		3.4	
38	25	surf	midden	1	jack/swamp	acetabulum+ishium	R		n		1.2	
38	25	surf	midden	1	jack/swamp	ishium	L		n		0.5	
39	18	surf	midden	1	armadillo	hum dist	L		n		2	
39	18	surf	midden	1	box turtle	nuchal frg	A		b		0.2	
39	18	surf	midden	1	box turtle	hyoplastron	L		n		1.3	
39	18	surf	midden	1	box turtle	neural frg	A		n		0.3	
39	18	surf	midden	1	c'tail	fem dist	L		b		0.5	
39	18	surf	midden	1	c'tail	mand frg	L		b		0.2	
39	18	surf	midden	1	c'tail	M1 lo	R		n		0	in socket
39	18	surf	midden	1	c'tail	M2 lo	R		n		0	in socket
39	18	surf	midden	1	c'tail	mand t'row	R		n		0.5	
39	18	surf	midden	1	c'tail	PM3 lo	R		n		0	in socket

39	18	surf	midden	1	c'tail	PM4 lo	R		n		0	in socket
39	18	surf	midden	1	canid	ascend ramus	L		n		0.7	
39	18	surf	midden	1	canid	axis frg	A		n		0.3	
39	18	surf	midden	1	canid	carpal unid	R		n		0.8	
39	18	surf	midden	1	canid	occip condyle	L		n		0.3	
39	18	surf	midden	1	canid	occip condyle	R		n		0.6	
39	18	surf	midden	1	canid	PM4 up	R		n		1.1	
39	18	surf	midden	1	canid	ulnar notch+shft	R		n		2.6	
39	18	surf	midden	1	deer	phx dist frg			b		0.5	
39	18	surf	midden	1	deer	phx1 dist	R		b		2.2	
39	18	surf	midden	1	deer	tib shft frg			b		2.9	sp frac
39	18	surf	midden	1	deer	antler frg			n		3.5	
39	18	surf	midden	1	deer	phx3 prox	R		n		0.6	
39	18	surf	midden	1	jack/swamp	mand t'row	L		b		1.2	
39	18	surf	midden	1	jack/swamp	PM3 lo	L		b		0	in socket
39	18	surf	midden	1	jack/swamp	PM4 lo	L		b		0	in socket
39	18	surf	midden	1	softshell tur	shell frg			b		0.4	
39	18	surf	midden	1	squirrel	fem shft	L		n		0.4	
39	18	surf	midden	1	squirrel	hum shft	R		n		0.4	
39	18	surf	midden	1	turkey	tbt shft frg			n		1.6	
39	18	surf	midden	1	turkey	tmt prox	R		n		1.8	
39	18	surf	midden	1	turtle	shell frg			b		0.2	
39	18	surf	midden	1	turtle	shell frg			n		0.4	
39	18	surf	midden	2	box turtle	peripheral			n		1.3	
39	18	surf	midden	2	deer	mtpod shft frg			b		2.6	sp frac
40	20	surf	midden	1	box turtle	neural frg	A		n		1.1	
40	20	surf	midden	1	box turtle	nuchal frg	A		n		0.5	
40	20	surf	midden	1	box turtle	peripheral			n		0.4	
40	20	surf	midden	1	canid	mand condyle	L		b		0.9	
40	20	surf	midden	1	canid	tib dist	R		n		2	
40	20	surf	midden	1	deer	antler frg			b		5.3	
40	20	surf	midden	1	deer	mtpod shft frg			b		1.1	sp frac
40	20	surf	midden	1	deer	rad shft frg			b		3	
40	20	surf	midden	1	deer	phx2 prox frg	R		n		0.4	
40	20	surf	midden	1	deer	tib dist	R		n		12.3	sp frac
40	20	surf	midden	1	jack/swamp	fem shft frg			b		0.7	
40	20	surf	midden	1	opossum	ulna prox	L		n		1.1	
40	20	surf	midden	1	turkey	coracoid shft frg	L		b		1.3	
40	20	surf	midden	2	turtle	shell frg			n		1.1	
41	21	surf	midden	1	c'tail	fem prox	L		n		1.5	
41	21	surf	midden	1	canid	mand condyle frg	L		b		0.2	
41	21	surf	midden	1	canid	C lo	L		n		0.5	in 2 frgs

41	21	surf	midden	1	canid	Mc1 prox	R		n		0.6	
41	21	surf	midden	1	canid	rad	R	imm	n		1.6	no epiph
41	21	surf	midden	1	canid	rad shft			n		1.9	
41	21	surf	midden	1	deer	hum dist frg			b		3.2	
41	21	surf	midden	1	deer	mtpod prox frg			b		0.7	sp frac
41	21	surf	midden	1	deer	patella frg	R		b		3.6	
41	21	surf	midden	1	deer	fem shft frg			n		0.8	sp frac
41	21	surf	midden	1	deer	hum dist frg	L		n		1.2	
41	21	surf	midden	1	deer	palatine	A		n		0.8	
41	21	surf	midden	1	deer	podial frg			n		1.1	
41	21	surf	midden	1	fish	vert	A		n		0.4	cf bowfin?; med size
41	21	surf	midden	1	jack/swamp	fem shft frg			n		0.3	
41	21	surf	midden	1	jack/swamp	mand frg	R		n		0.6	
41	21	surf	midden	1	raccoon	ulnar notch	R		n		0.5	
41	21	surf	midden	1	squirrel	fem shft frg	R		n		0.3	
41	21	surf	midden	1	turkey	hum dist	R		b		0.6	
41	21	surf	midden	1	turkey	hum prox frg			n		1.8	
41	21	surf	midden	1	turkey	phx prox			n		0.4	
41	21	surf	midden	2	box turtle	peripheral			b		0.9	
41	21	surf	midden	2	box turtle	peripheral			n		1.2	
41	21	surf	midden	2	deer	mtpod shft frg			b		1.7	
41	21	surf	midden	6	turtle	shell frg			n		2.5	
42	2	20to25	midden	1	turtle	shell frg			b		0.1	
43	3	0to10	midden	1	deer	phx1 dist	R		n		2	sp frac
44	3	10to20	midden	1	box turtle	peripheral frg			n		0.3	
44	3	10to20	midden	1	deer	hum dist frg	L		n		8.3	sp frac
45	3	20to30	midden	1	box turtle	peripheral			b		0.2	
45	3	20to30	midden	1	deer	mttar shft frg			n		4.5	sp frac
45	3	20to30	midden	1	jack/swamp	maxilla	L		n		1.1	
45	3	20to30	midden	1	turtle	shell frg			b		0.2	
46		surf	midden	1	fish	vert	A		n	drilled	1.2	lg individual
47		surf	midden	1	deer	ulna prox	R		n	awl (sharp)	9	hi-polish
48		surf	midden	1	bovid	incisor lo	L		n	drilled	1.6	hi-polish
49	30	surf	midden	1	deer	antler tine			n		17.7	

Appendix 3

Additional Investigations at the Anglin Site (41HP240) in Hopkins County, Texas

Timothy K. Perttula, Bo Nelson, and Lee Green

INTRODUCTION

In October 2008, Bo Nelson and Lee Green returned to the Anglin site (41HP240) to re-examine the profiles of the existing midden excavations on the south knoll, with the thought of acquiring additional archaeological information from controlled contexts in the midden deposits (if any remained intact) and assessing the likelihood that cultural features (pits or post holes) were present in and/or near the midden. To that end, two small units (40 x 40 cm and 50 x 50 cm in size) were hand-excavated along the northern part of the midden excavation profile, 10.5 m north of Unit 1 (see Figure 4, this volume). This appendix presents the results of that work.

EXCAVATIONS

An examination of the north wall of the previous excavations indicated that there were buried midden deposits remaining in this area, and a pit feature was also observed in the trench wall just west of the midden (Figure 63). A 40 x 40 cm unit (Unit 4) was excavated along the trench profile to investigate the midden deposits, while Unit 5 (50 x 50 cm unit) was excavated over the observed extent of the pit feature (Feature 1).

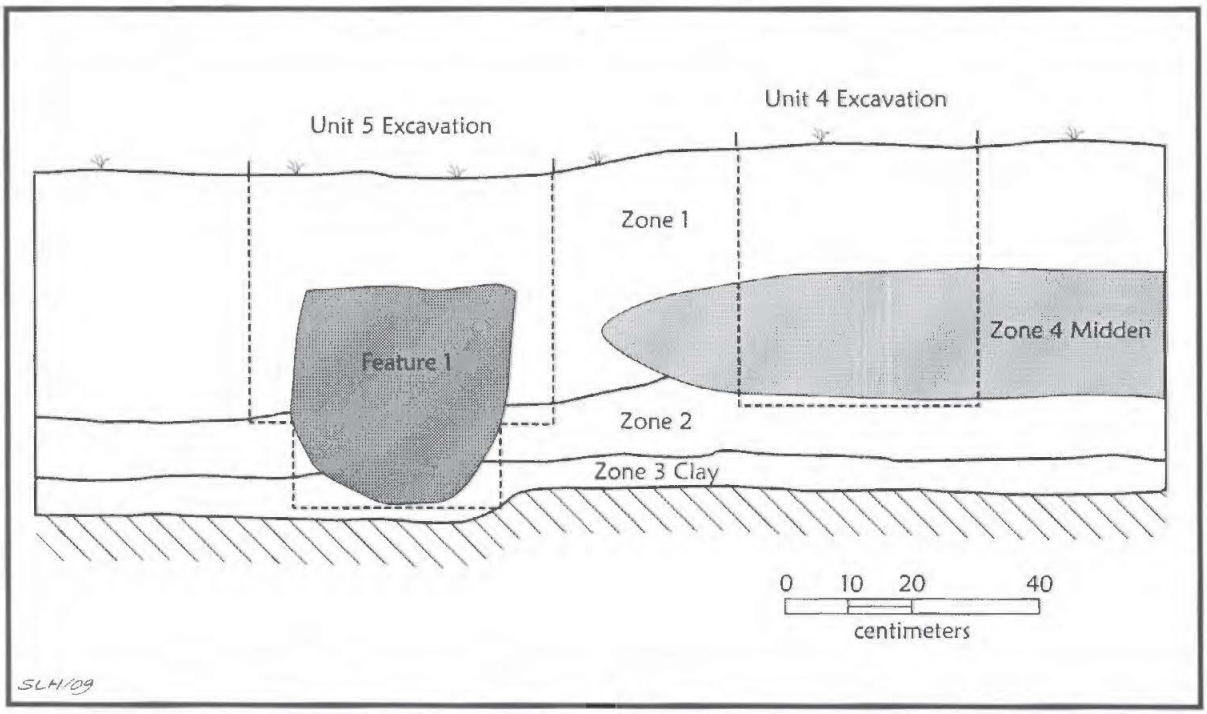

Figure 63. Profile of the north wall of the Anglin site excavations, showing the midden and pit feature (Feature 1), as well as Units 4 and 5.

The first two arbitrary levels (0-20 cm bs) of archaeological deposits in Unit 4 were screened through 1/4-inch mesh screen, but when the midden deposits were encountered (20-43 cm bs), the remainder of the unit fill was collected as fine-screen (1/16-inch mesh) samples; the unit was terminated at the base of the midden. This was done to enhance the recovery of charred plant remains, especially charred nutshells, in the hope of obtained a sufficiently large sample of nutshells to submit them for standard radiocarbon assay at Beta Analytic, Inc. In Unit 5, the archaeological deposits above Feature 1 were screened through 1/4-inch mesh screen, as were the deposits from 20-40 cm bs that were outside of the exposed pit feature. The fill of Feature 1 (20-53 cm bs) was collected as a single fine-screen sample.

The archaeological deposits in this part of the Anglin site consist of a dark brown (10YR 3/3) A-horizon sandy loam (zone 1) that is between 40-43 cm in thickness, beginning at the modern day ground surface (see Figure 63). These deposits overlie a dark yellowish-brown (10YR 4/4) sandy loam E-horizon (zone 2, approximately 5-10 cm thick) and a strong brown (7.5YR 4/6) clay B-horizon (zone 3). The B-horizon is encountered between ca. 45-50 cm bs. In one area of the trench profile, the A-horizon has an organically enriched and black (10YR 2/1) midden deposit (zone 4) that is a maximum of 23 cm (20-43 cm bs) in thickness; the E-horizon (zone 2) underlies the midden. Feature 1 apparently originates in the middle part of the zone 1 A-horizon, at approximately the same depth (18 cm bs) as the top of the zone 4 midden deposits (see Figure 63). This pit feature is approximately 37 cm in diameter and has straight walls and a rounded bottom. The pit fill is a very dark grayish-brown (10YR 3/2) sandy loam with charcoal and bone flecking and small burned clay nodules.

The fact that top of Feature 1 is at virtually the same depth as the top of a ca. 23 cm thick midden deposit suggests that the pit feature may have been dug about the time that the accumulation of the Late Caddo midden deposits ceased. The source of the A-horizon sediments above the midden and Feature 1 is not known, but may be the product of bioturbation and natural soil accumulation after the Anglin site was abandoned by Caddo peoples in the 17th century A.D.

ARTIFACTS

Prehistoric artifacts are abundant in the two small units excavated in 2008 at the Anglin site, particularly pieces of burned clay/daub and animal bone in the Unit 4 midden deposits (Table 27). By unit, the artifact density ranges from 752 (Unit 5) to 4594 (Unit 4) artifacts per m^2 in these excavations. Burned clay/daub and animal bone are also relatively abundant in the fill of Feature 1.

Table 27. Artifacts recovered in Units 4, 5, and Feature 1 at the Anglin site.

Artifact Category	Unit 4	Unit 5	Feature 1	N
decorated sherd	10	17	2	29
plain sherd	30	58	3	91
clay piece with tapered pt.	1	–	–	1
burned clay/daub	447	34	48	529
lithic debris	31	27	–	58
animal bone	206	42	20	268
mussel shell pieces	10	10	2	22
Totals	735	188	75	998*

*charred plant remains—wood charcoal and charred nutshells—are not included in the artifact totals as they have not been quantified.

The ceramic sherds (n=120) from the Anglin site are from fine ware and utility ware vessels tempered uniformly with grog. A small percentage also have crushed and burned bone (6.3%) or hematite/ferruginous sandstone (7.8%) added to the clay paste along with the grog temper. A few other sherds (6.3%) have charred organic materials in the paste—indicative of incomplete firing that failed to completely combust these materials in the clay paste—and 4.7% of the vessel sherds have a sandy paste. These latter sherds suggest that occasionally a Caddo potter at the Anglin site chose to use a naturally sandy clay for vessel manufacture.

Although most of the sherds are small from the excavations, the decorated sherds (n=29) include 13 (45%) from fine wares (engraved and red-slipped) and the remainder from utility wares (n=16, 55%). Among the fine wares, engraved sherds comprise 77% of the sample, and the remainder (n=3, 23%) are from red-slipped vessels. The most common decorative methods represented in the utility wares are appliqued elements (n=7, 44%) and neck banding (n=4, 25%), followed by sherds with incised (n=2, 12.5%), punctated (n=2, 12.5%), and corn cob impressed (n=1, 6.3%) decorations.

The fine wares in Unit 4 include two rims (0-10 cm bs and 30-40 cm bs) from Ripley Engraved carinated bowls with scroll elements; one of these also has a red slip on both interior and exterior sherd surfaces. Another body sherd from 30-40 cm bs in Unit 4 is likely from a Hodges Engraved vessel as it has a curvilinear engraved line (from a scroll element?) with small triangular tick marks on it. There is also a red-slipped body sherd (0-10 cm bs). The utility wares in Unit 4 include two body sherds with rows of tool punctates, a La Rue Neck Banded body sherd (0-10 cm bs), and an Anglin Impressed body sherd from 10-20 cm bs.

The Unit 5 fine wares include four sherds from Ripley Engraved carinated bowls with small portions of scroll motifs on the rim panel; one of these (0-10 cm bs) has a red slip on interior and exterior sherd surfaces. The two other Unit 5 fine wares are body sherds with an exterior red slip. Among the utility wares, one body sherd (found in situ at 30 cm bs) has a set of opposed incised lines. Two other sherds—a body and a rim—are from La Rue Neck Banded vessels (0-10 and 10-20 cm bs). The remainder of the decorated utility ware sherds from this unit have appliqued decorative elements, including: parallel appliqued ridges (n=2, 0-10 cm bs, and found in situ at 30 cm bs); a single straight appliqued ridge (n=2, 0-10 and 20-30 cm bs); a single straight appliqued fillet (n=1, 0-10 cm bs); a single straight appliqued fillet and adjacent appliqued node (n=1, 0-10 cm bs); and appliqued nodes in a cluster (10-20 cm bs). These appliqued elements are body decorations on both McKinney Plain and La Rue Neck Banded vessels.

In Feature 1, there are two decorated sherds. They include a rim from a Simms Engraved carinated bowl, with a rim panel marked by upper and lower horizontal engraved lines with rows of small triangular tick marks that point towards the center of the rim panel, and a La Rue Neck Banded body sherd.

One clay piece with a tapered point was recovered from archaeological deposits above the midden (10-20 cm bs) in Unit 4. Similar clay objects had been documented in previous collections from the Anglin site (see Figure 48a-d, this volume).

The vast majority of the burned clay/daub pieces (n=529) from these excavations at the Anglin site are very small and rounded nodules and fragments. Their occurrence in the midden and near-midden deposits suggest that clay-lined hearths, ovens, and daub-covered structures are likely present in the area of the midden or at other locations at the site not far removed from the trash midden accumulation.

The lithic debris from these excavations are from chert (n=1, 1.7%), quartzite (n=47, 81%), and petrified wood (n=10, 17.2%) raw materials that were reduced during the process of chipped stone tool manufacture. The one chert flake is a non-cortical piece of a non-local gray chert; this flake must have been removed from a completed or nearly finished tool brought to the site, and then removed again for a further use. The quartzite and petrified wood are available as pebbles and cobbles in local stream gravels. Between 17.6% (petrified wood) and 31.9% (quartzite) of the flakes from the knapping of these two local raw materials have cortex from initial and secondary pebble and cobble reduction activities, indicating that chipped stone tool knapping to obtain useful flakes for tool use (i.e., arrow points and flake tools) was a regular activity of the Caddo occupants at the Anglin site. The dense quartzite raw material had to be regularly heat-treated to improve its knappability: more than 76% of the quartzite flakes (including 13 cortical flakes) in this small sample have evidence of heat-treatment.

The animal bone and mussel shell pieces are refuse from hunting and gathering and food processing activities that accumulated in and near the Anglin site's midden deposits. The majority of these pieces are small, burned fragments (especially the animal bone), although white-tailed deer bone is present in the collection.

CONCLUSIONS

Limited investigations in October 2008 at the Anglin site (41HP240) documented midden remnants at one end of a pre-existing trench profile, as well as a small pit feature (Feature 1). Animal bones, burned clay/daub, ceramic vessel sherds, and lithic debris from chipped stone tool manufacture, are abundant in these deposits. These remains are from a post-A.D. 1500 Caddo habitation. Clearly the archaeological potential of the Anglin site's archaeological record has not been exhausted. Hopefully with the sorting and analysis of the recovered plant remains, samples of charred nutshells can then be submitted to Beta Analytic, Inc. for radiocarbon dating to establish the absolute age range of the Anglin site midden deposits.