Bulletin of the TEXAS ARCHEOLOGICAL SOCIETY Volume 87/2016

Robert Z. Selden, Jr., Editor

Timothy K. Perttula, Assistant Editor

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ARTICLES

Bulletin of the Texas Archeological Society
Foreword

Robert Z. Selden Jr.

Over the previous year, the Texas Archeological Society (TAS) membership has been asked for their input on a number of topics associated with the *Bulletin of the Texas Archeological Society* (*Bulletin*). I want to start by thanking all of those who took the time to offer their input as we continue to explore options associated with identifying topics of interest to the TAS. I also want to express my gratitude to the Assistant Editor, Timothy K. Perttula, for sharing his wealth of editorial experience as we have worked to assemble this volume, and to Tamra L. Walter for making the editorial transition a very smooth one.

In an effort to ensure that *Bulletin* content remains in-step with the desires of our readership, I used your feedback to assemble a four-year plan (through 2020) that will reinvigorate some of the more engaging aspects of the *Bulletin* that our readers have enjoyed in the past. This will include a *Highlighting the Society* section, revived from Nancy Kenmotsu's years at the *Bulletin*, which will be devoted to showcasing the many popular and good works of the TAS and its membership to ensure that all members know of, and thus can take advantage of, those aspects of the TAS about which they may have had only limited knowledge.

For the 2017-2020 *Bulletins*, I will be starting a *Reports* section, specifically aimed at soliciting contributions from authors engaged in applied archeology in Texas. Contributions to the *Reports* section will be comprised of case studies, reviews and short papers that focus upon a specific problem or debate in local archeology. This can include major findings from survey, testing, and data recovery investigations throughout the State of Texas. Contributions to the *Reports* section can also focus upon experimental archeology; however, the primary focus of this section will be to highlight the application of established methods of inquiry to specific case studies in Texas. While there are no stringent page restrictions for the *Reports* section at this time, I encourage our authors to keep their contributions to 15 pages of text or less, excluding references, figures, and tables.

Throughout the year, several members have expressed an interest in reviving the *Book Reviews* section of the *Bulletin*. I have already entertained a number of requests for volumes to review, and have reached out to the publishers to request review copies that should be on their way to those folks. *Book Reviews* will be added beginning with the 2017 volume. If there is a volume that you would like to review for the *Bulletin*, please forward the name of the author, book title, and publisher, and I will reach out to the publisher to request a review copy.

Thematic Sections, 2017-2020

While my initial goal was to shift between thematic and general volumes every other year, this changed after getting your feedback. In lieu of thematic volumes, the 2017-2020 *Bulletin* will include both thematic and general sections. The topics for each of these *Thematic Sections* were lifted directly from the survey results, and reflect the interests of the TAS membership. The 2017-2018 volumes will only include one thematic section in each, and the 2019-2020 volumes will include two. I am happy to consider additional proposals for special thematic sections, but I ask that proposers please plan for a minimum of five papers for any special thematic section.

Among the most sought-after content from our readers is historic archeology. In response to this, the thematic section for the 2017 *Bulletin* will be *Historic Archeology: Cemeteries, Sites, Rails, and Trails*. This thematic section was initially to be geared toward historic roadways, but was broadened to include

historic cemeteries, sites, and—after a discussion with several of our members—the earliest historic railways (ranging from logging trams to passenger and freight trains). I would be particularly interested in contributions for historic sites that articulate with cemeteries, rails, and/or trails, but will gladly consider any submission to the section that falls within the larger category of *Historic Archeology*.

In 2018, we will move to a discussion of typology and taxonomy with a thematic section entitled *The Many Texas Types: Points, Pots, and Others*. This section will focus upon challenges to our current system(s) of classification, regardless of material culture (i.e., projectile points, ceramics, rock art, textiles, structures, etc.). What I am most interested in for this volume are critiques of the currently-defined types that may help us to better characterize Texas prehistory. I should clarify here that while the focus of this thematic section is aimed at identifying challenges with the current system, authors should also proffer potential solutions.

The 2019 volume will be the first in this four-year plan to include two thematic sections; one for *Bioarcheology in Texas*, and the other for *Modeling Texas Archeology*. Bioarcheology regularly contributes to archeological studies in Texas; however, there have been few articles in the *Bulletin* that deal with bioarcheology. This thematic section is geared toward case studies from Texas and the surrounding region. Modeling in Texas archeology has taken many forms over the years: from predictive models to social networks. This thematic section will focus upon the theoretical and methodological advances in archeological modeling that are helping us to better understand and interpret Texas prehistory.

Also inclusive of two planned thematic sections, the 2020 volume of the *Bulletin* will include one section on *Native American Voices*, and another on *The Paleoindian Period in Texas*. The *Native American Voices* thematic section will focus upon current issues and challenges that face Native American communities in relation to archeology. Whether NAGPRA, curation, compliance, or other, those communities with historic and prehistoric connections to Texas will be contacted to solicit contributions. Texas has a rather strong connection to Paleoindian archeology, and this thematic section will capitalize on recent theoretical and methodological advancements in the analysis of Paleoindian artifacts, features, and sites. While Pre-Clovis or Older-Than-Clovis is of particular interest to our readership based upon the *Bulletin* survey results, I wanted to leave this as a broader section that can capture additional research from the period.

A formal Call for Papers will be distributed over TxARCH-L immediately following each Annual Meeting, and—should there be room—will also be included in the TAS Newsletter. I will also be speaking with authors that I know are working on some of these topics to see whether they would be willing to contribute to the thematic sections listed above.

Color

The cover of the *Bulletin* will continue to be printed in color. Printing in full color is equally as cost effective as printing two-color due to set-up and quantity, and the plan is to incorporate as much color as our budget will allow. Additionally, all digital versions of the *Bulletin* will now be in full color.

Call for Papers

At this time, I would like to solicit research articles, reports, book reviews, and *Highlighting the Society* contributions for the 2017 *Bulletin*, including the 2017 thematic section that will be focused upon *Historic Archeology: Cemeteries, Sites, Rails, and Trails*. Those authors wishing to submit their work for formal peer review should submit their manuscripts no later than March 1, 2017. Works requiring only editorial review should be submitted no later than May 1, 2017.

We encourage authors to submit both color and black-and-white versions of all figures for the 2017 volume. While it may not be possible to include all of the color figures in the printed version, we are hopeful that we will be able to include all of them in the digital (.pdf/A) format. Should authors want to include data, or interactive figures, we encourage them to do so. Any supplementary data can be uploaded to a digital repository (ie., Zenodo, + tDAR, etc.), then cited in the article.

Texas Archeological Society 1998 Excavations at the L. E. Wagner Site (41VT128), Victoria County, Texas

David G. Robinson, with contributions by J. Kevin Hanselka and Dale Hudler

Site 41VT128, the L. E. Wagner site, was excavated as part of the 1998 Texas Archeological Society Field School. The site lies near Mission Creek where it flows into the Guadalupe River floodplain in Victoria County. Clear Fork tools at the site suggested possible Paleoindian occupations, but a 2-sigma calibrated age of an AMS assay of 3772-3943 B.C. taken on *Condalia sp*. charcoal, fuel wood from a constructed hearth, places the site and its occupations in the later Early Archaic period. Excavations also showed the cultural materials from the site came from a paleosol that may be spatially extensive on the Guadalupe River floodplain. This relict soil zone may contain similar small, low-density camps throughout its extent. The regional site and environmental comparisons suggest a prehistoric subsistence pattern of exploitation for creek-side resource zones. The artifact assemblage from the L. E. Wagner site reflects the results of inland migratory patterns and little if any interaction with peoples of the coastal zone and its resources. The Early Archaic period was a time of marked diversity in site features, site patterning, artifact assemblages, and subsistence practices.

Circumstances of Discovery and TAS 1998 Field School

The site was discovered on the L. E. Wagner ranch from surface finds by Texas Historical Commission (THC) Steward Smitty Schmiedlin while traveling to another known site on the property (Texas Archeological Research Laboratory 1997). Schmiedlin's initial site record was dated April 11, 1997. On April 23, 1997, Thomas R. Hester, Tamra Walter, and Kay Hindes visited the site. They concurred with Schmiedlin's observations that the site may have buried intact deposits of early prehistoric age. A few 1996 notes and catalog entries refer to site collections and visits, but these visits are not on record or in the explanatory field notes.

After this initial site survey and the observation and collection of artifacts from the surface, it was thought that the L. E. Wagner site may represent a deeply buried site with deposits and features dating to the Early Archaic or Paleoindian periods. If so, the site would have considerable research potential, given the general rarity of sites from those time periods and their continuing archeological research interest.

The earliest and best opportunity for fieldwork investigation at the site was the 1998 Texas Archeological Society (TAS) Field School in Victoria, Texas. The principal focus of the field school was historical archeological investigations of Mission Espiritu Santo in Victoria. But the TAS also favored the apportionment of fieldwork resources for excavations of the L. E. Wagner site, including backhoe trenching and auger testing. One week of fieldwork was deemed sufficient for gathering the requisite information needed to evaluate the site. Contacts with the L. E. Wagner family were favorable and provided the requisite permissions for the investigations reported herein.

Strategy and Progress of Work

The excavation strategy for the L. E. Wagner site was to expose and identify the earliest cultural deposits and associated artifacts. The TAS Field School approach was two-fold: (1) to excavate backhoe trenches dispersed across the site to find the most likely concentrations of artifacts and/or features, and (2) based on the backhoe findings, to conduct precise and quantifiable hand excavations to identify and interpret preserved cultural remains.

The TAS Field School implemented this strategy in sequential order. Before the field school excavators arrived, a backhoe was used to excavate several trenches of varying shapes and sizes to determine the possible extent of buried cultural materials. TAS personnel made these decisions and monitored the progress of the backhoe. Guidance for the backhoe work was gained from the 1997 surface inspection. After the backhoe excavations were

accomplished, the field school excavators began to carry out hand excavations in test units (TU) or excavation squares in those areas determined most likely to yield artifacts and features. The objectives of this testing phase at the site were listed succinctly by site supervisor Jimmy Smith in his field notes: (1) find diagnostic artifacts to date the occupation(s), (2) locate a feature with dateable material, and (3) recover additional artifacts to provide an indication of the nature of the site (TARL files). This is why the largest array of test units, TU 1-8, were placed on the floor of BHT 3, so as to excavate downward into those cultural contexts presumed to be the earliest. This also explains why these excavations began in Soil Zone II rather than in the overlying Soil Zone I.

TAS member Mike Davis directed the hand excavations, and Jimmy Smith served as the site supervisor. TAS Field School Director Thomas R. Hester provided overall guidance. The crew chiefs, assigned to supervise specific portions of the excavations, were Glynn Osburn, Tiffany Osburn, and Bill Schuermann. The TAS Field School excavators who did most of the work were assigned variously from camp headquarters to provide a wide range of fieldwork experiences to Field School participants. The list of site excavators is therefore long, but the number of excavators on the site on any given excavation day varied between six and 10. They were Susan Smith, Sue Hamblin, Donna Sieger, Roy Whitney, Brenda Jackson, James Byers, David Goss, Ramona Baker, Dale Hudler (TDS instructor), Mike Shannon, Jeanette Mitchell, Paula Vastine, Glenn Scott, Bill Birmingham, Lorna Smith, John Wilson, Laurel Wilson, Brennan Smith, Travis Haskin, and Doris Howard.

A total of seven days of fieldwork was spent at the site, from June 13 to June 19, 1998. The backhoe trenching, most of which took place the previous March, was of unknown duration.

Natural and Cultural Setting

The L. E. Wagner site is in Victoria County, Texas, a few miles northwest of Victoria, the county seat. The site lies on the L. E. Wagner property on the edge of a riverine alluvial terrace about 50 m south of where Mission Creek incises the terrace and flows 800 m east to its confluence with the Guadalupe River (Figure 1). The physiographic environment is termed the Outer West Gulf Coastal Plain physiographic province by Fenneman (1938). The plain is formed of southeast-dipping Tertiary and Quaternary formations striking in arcs generally parallel to the coast. The province's topography is flat to gently rolling under the erosive forces of stream action and wind, which also form occasional clay dunes and shallow depressions. Although the immediate site locale is a terrace edge overlooking the Guadalupe River floodplain, relief is not great. The site lies at 115 feet above mean sea level (amsl), while the near riverbank of the Guadalupe

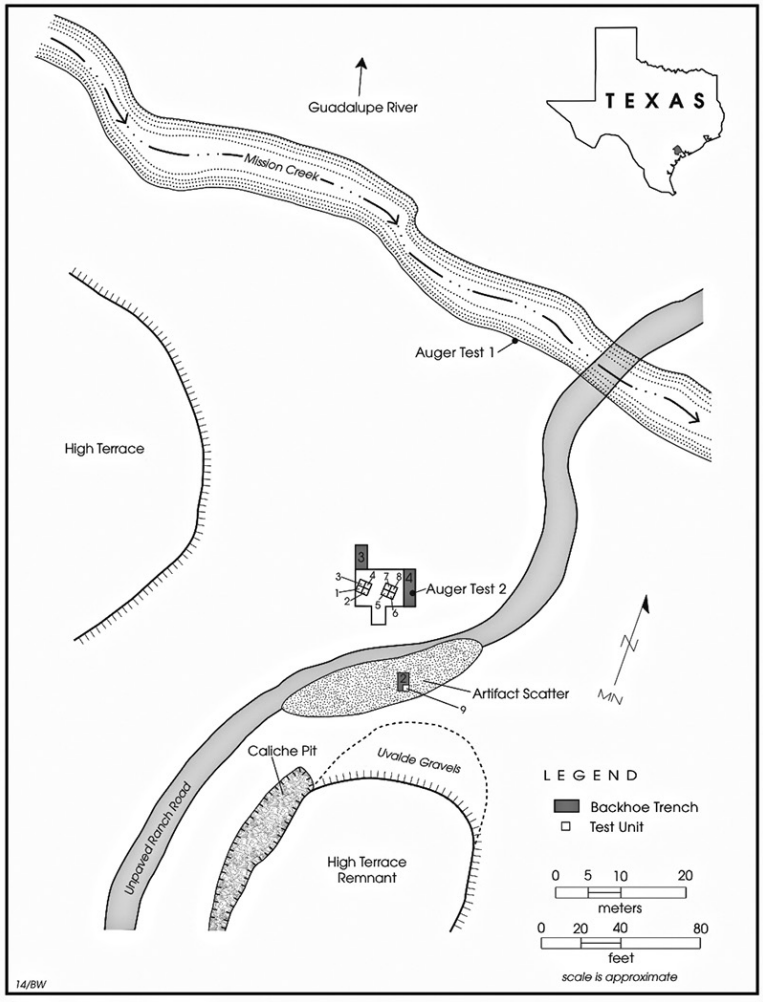

Figure 1. Map of the L. E. Wagner site (41VT128).

River is 75 feet amsl, a difference of 40 feet (13 m) over a distance of 0.8 km. Within this local site setting, however, there exist complex terrace sequences, geomorphic forms, and pedogenic processes that have produced micro-relief.

The site is described as "on the edge of a small gravel-covered knoll" (TARL files), with current land use as a pasture (Figure 2). Site photographs show sloping terrace surfaces covered by short pasture grasses, with a few live oaks growing on the site and peripheral terrace slopes.

Flora and Fauna

The region lies within Gould's (1975:2) Gulf Prairies and Marshes floral zone. The successional climax here would be tall grass prairie but intensive grazing in the past has promoted the dominance of brushy species. Uncultivated land is in brush, variously dominated by mesquite, prickly pear, and several species of acacia. Subdominants include white brush, black brush, hackberry, ash, yaupon, numerous other woody brush species, various cacti, succulents, and grasses. Where prairie communities persist, they include little bluestem, switchgrass, brownseed paspalum, partridgepea, and other grasses. Motts of oak grow in the flat uplands, and these include live oak, blackjack oak, and post oak. Trees also crowd the stream courses. Mesquite prairies, favorable for browse, were noted in the area historically (Inglis 1964:40).

Animals of the Tamaulipan Biotic Province (Blair 1950:102-105) find rich habitats in the undisturbed areas of the region. Sixty-one species of mammals are known, including badger, gray fox, coyote, cottontail rabbit, jackrabbit, opossum, raccoon, armadillo, and spotted and striped skunk. The province has 36 species of snakes. The region also lies under the Gulf Coastal Flyway, which yearly sees numerous species and countless individuals of migratory fowl fly over in cyclical seasonal migrations between Canada and South America.

Geology

The site is located on the Pleistocene Lissie formation, one of the many Coastal Plain formations whose strike curves roughly parallel with the Gulf coast. In this regional section, the Lissie Formation is mapped undivided between the Montgomery and Bentley formations, i.e., the two are indistinguishable within it here, and the Lissie is comprised of sand, silt, clay, and minor amounts of gravel. The formation contains iron oxide and iron-manganese

Figure 2. Site environment, with backhoe trenching in progress.

nodules in zones of weathering, and, in its upper part, calcium carbonate concretions. The surface is fairly flat and featureless except for numerous rounded shallow depressions and pimple mounds (Bureau of Economic Geology 1975). Soil processes similar to those operating on the site may form these minor features. The dynamic processes driving changes in micro-relief—pimple mounds, shallow depressions, and cracking soils—derive from the properties of clays with high shrink-swell potential.

Soils and Geomorphic Setting

The soils mapped on the site are Straber loamy fine sands in the uplands on slopes ranging from 0 to 5 percent (Miller 1982). Their A-horizons are pale brown and very pale brown loamy sands, loose with very weak structure or without structure. The B-horizons show strong brown and light gray clays with weak or medium angular blocky structure with mottles. The C-horizons are light gray clays with massive structure, hard, and with mottles (Miller 1982:79).

Geologist O. Frank Huffman visited the site and offered observations and notes on the geomorphic setting of the site. He mentioned in his notes that the published description of the soils for the site varied greatly from the site deposits exposed in the backhoe trenches, excavation units, auger holes, and cut banks. The site deposits vary in that they are much darker and have much higher clay content than the Straber soils. The high clays give them stronger structure and features such as slickensides and clay films. Clays throughout the Lissie formation have high shrink-swell potential and features that stem from that peculiar mineralogy; on the site, this is manifest as soil surface cracking and perhaps gilgai relief or pimple mounds.

The site lies approximately 100 m south of a mapped boundary with Sinton clayey loam, said to be occasionally flooded (Miller 1982:31-32). Those soils encountered on the site by the archeologists and described by Huffman are more similar to the Sinton clayey loam in their physical traits and vertisolic nature than they are to the sandier Straber series. Zone II deposits predominated in the hand-excavated areas, the overlying Zone I deposits having largely been removed by the earlier backhoe trenching. It is probable that the sandy Zone I deposits relate to the mapped Straber series, while the underlying Zone II and Zone III deposits match the Sinton clayey loam.

The site depositional relationships as a whole relate more to the underlying river terrace system and the processes giving rise to the paleosol on the site. The maturity and long term development of the paleosol is indicated by: (1) the thickness of Zone II in Backhoe Trench (BHT) 4, which is just over 90 cm (Figures 3-4); horizon thickness is a primary measure of horizon maturity; (2) the paleosol has well developed columnar peds (Figure 5), also of pronounced hardness; and (3) the accelerator mass spectrometry (AMS) assay of 5037 ± 24 years B.P. was obtained on a charcoal sample collected from Feature 3 in Zone II contexts in TU 9 at a depth of about 20 cm below the modern ground surface. The burial of the paleosol would have truncated the orthogenetic processes forming Sinton soils.

Allvial Versus Vertisolic Action. The excavations of the eight clustered test units in the site found numerous rocks, stone flakes, shells, and an untyped biface in the bottom of a feature on edge, or oriented with the edges perpendicular to the ground surface. Explaining this unusual situation for excavated materials became a theme in the daily excavation notes and descriptions. A commonsense explanation for the situation was that the jumbled nature of the recovered items resembled that of gravel-bottomed stream beds, and therefore the excavated materials had been deposited in a stream bed. By implication, although never stated, the materials excavated from the test units therefore described not a portion of a living surface of a habitation site but instead they described a stream bed, or in this specific locale the floor of a rill or gully.

Records taken later in the week of excavation gave a theoretical explanation for the on-edge artifacts somewhat contradictory and at odds with the stream bed hypothesis, although the two ideas were never explicitly opposed in any summary statements, nor were they logically reconciled. The second and latter idea explains the repose of the aberrant items by reference to vertisolic soil action. The Victoria County/Guadalupe River region is well within the zone of vertisols (Duffield 1970). The soil group is named for the strong vertical surface cracks that form on the soils. The cracks may be inches wide and potentially several feet deep. They form in profiles with significant fractions of silt and clay of a type that swells when moistened, as in seasonal rains. The seasonal cracking of these soils is said to "churn" the materials in their profiles (Duffield 1970:1055). The site excavators proposed that flat-lying artifacts move horizontally by this vertisolic

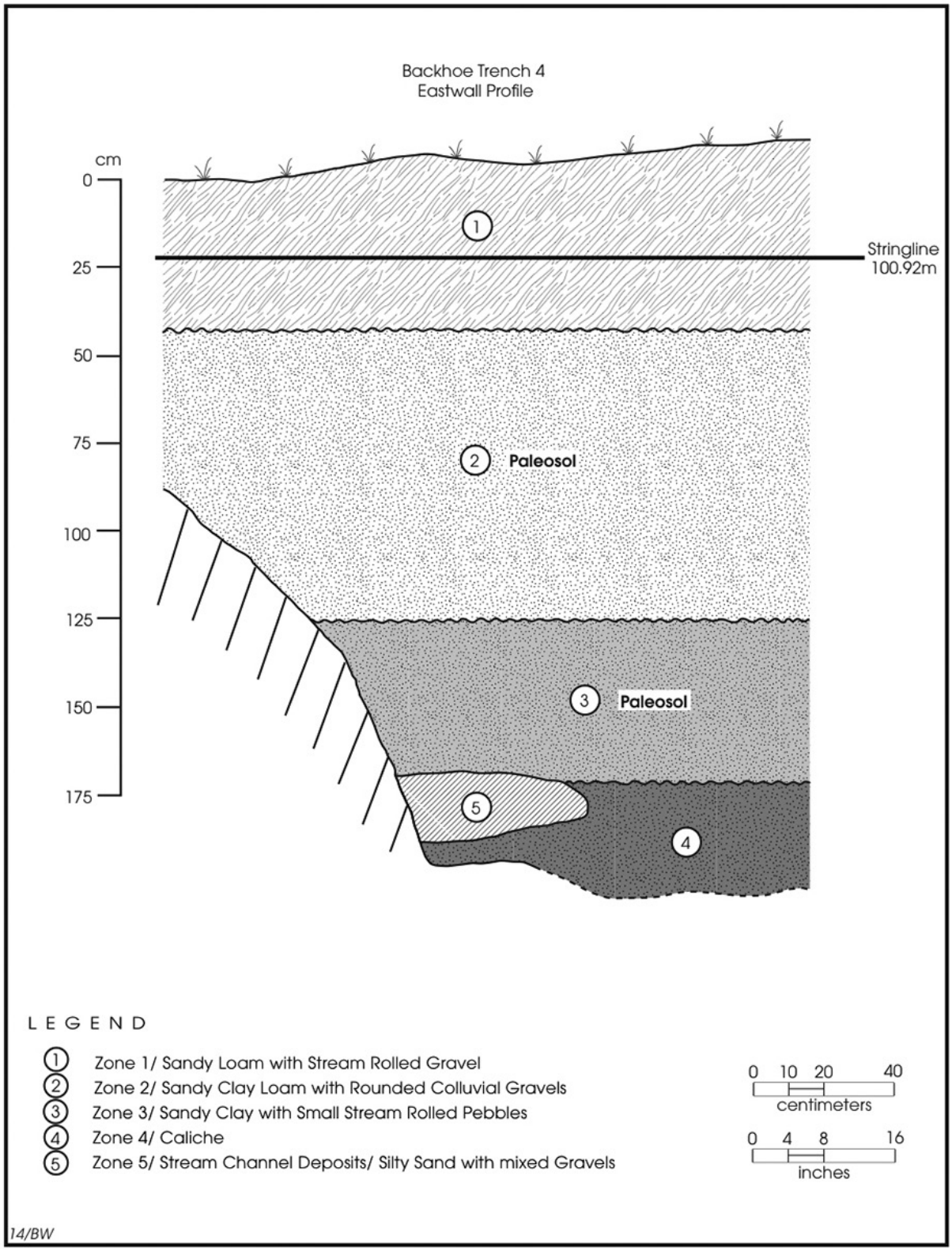

Figure 3. East wall profile of BHT 4.

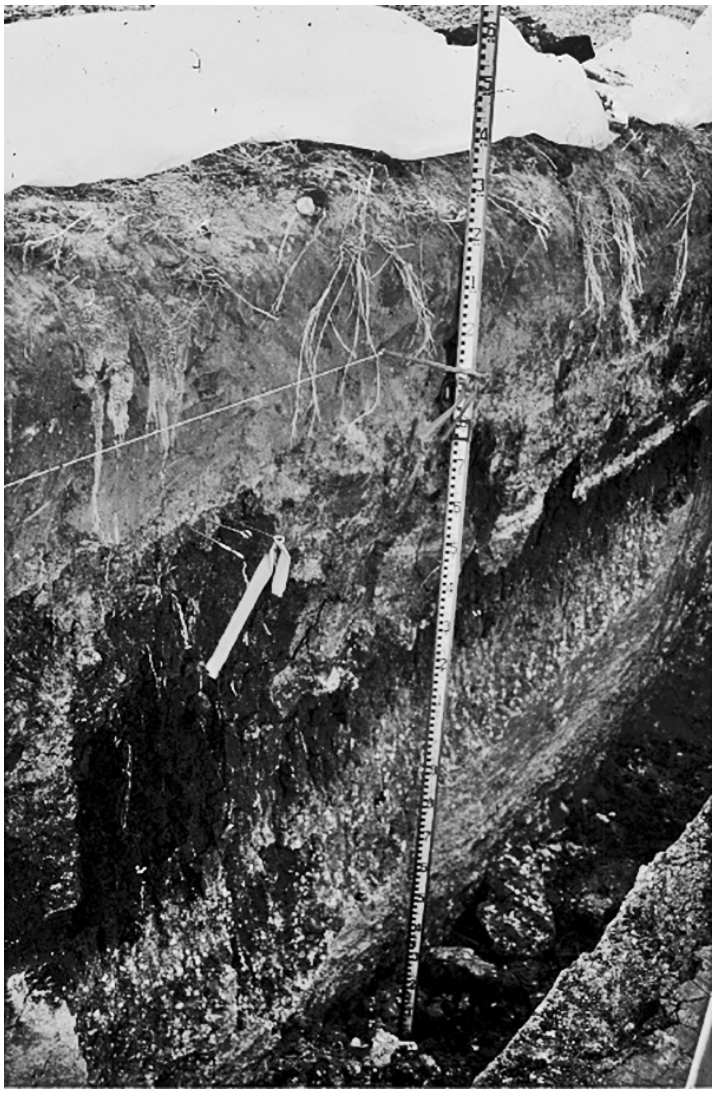

Figure 4. Soil profile of the east face of BHT 4.

Figure 5. Site soil detail, columnar peds from Soil Zone II.

action until a crack forms near them and they fall into it or become wedged in an approximately edge-vertical position. This is entirely a pedological process that does not take place in an open stream bed. The stream bed hypothesis, contradictorily was applied partially to reinterpret clustered mussel shells in Test Unit 2, designated Feature 2, as a natural (alluvial) jumble rather than a cultural feature. Geologist O. Frank Huffman (see below) described local conglomeritic lenses in Soil Zone III, noting that they reflect discrete depositional events (see Figure 3, stratigraphic zone 5). One such conglomeration was also noted in Test Unit 3 in Soil Zone II, comprising most of Level 5, and labeled in excavation forms and notes as "river pebbles and gravels."

Reconciliation of these competing hypotheses may be possible. The features explainable by fluvial action (mussel shell of disallowed Feature 2) may have occurred in the period of deposition of Zones II and III in periodic, seasonal flood events, but not by regular flow in a stream channel. The stone and other materials in vertical positions probably shifted dynamically to their positions by vertisolic activity during the zone's soil development period, or soil horizon formation. This would have taken place well after the period of the initial fluvial deposition of clays, sands, and silts.

Geomorphological Observations. Geologist O. Frank Huffman visited the L. E. Wagner site during the excavations while trenches and profile faces were open. He wrote copious notes and walked and drove geological transects as far as the Guadalupe River. His notes, observations, and diagrams comprise a valuable professional contribution to the TAS. This section is abstracted from his findings and observations.

Huffman's notes on his visit to the site environs began with descriptions and diagrams of the immediate site setting. The culture-bearing deposits of the site lay between two alluvial

terraces about 130 m south of the banks of Mission Creek. The higher terrace is to the south, and is designated T_H, while the lower, northern terrace is termed T_L. The T_H terrace locally has Uvalde gravels on its surface. The T_L terrace is a Mission Creek terrace, and it continues beyond the creek channel east and northeast very near the Guadalupe River. In the vicinity of the site, all excavated and observed deposits are parts of the T_L terrace. The terrace most likely rests on the bedrock Lissie Formation at depths more than 4 m from the surface, as measured by auger holes excavated in the bottoms of backhoe trenches. These probes opened the deposits to slightly deeper than 4 m bs but did not expose Lissie materials.

The site has three principal soil deposit strata, numbered from upper to lower (Figure 6). Unit 1 (also Soil Zone 1—the terms Unit and Soil Zone were used interchangeably by the excavators and Huffman) consists of a sand varying in color from brown to dark grayish-brown and dark gray brown. The sand is fine- to medium-grained with a few gravels and a minor clay component. Unit 2, a paleosol, comprises a black, very clayey loamy sand with medium-to-coarse grain sizes. The basal 30-40 cm of the unit has a distinct fine columnar structure. Unit 2 has a gradual boundary with Unit 3, which also is a paleosol. The deposit is gray, formed by a texturally fine- to coarse-grained very clayey sand. The deposit is locally conglomeritic, with white calcium carbonate mottles as well as nodules and threads of caliche throughout. The conglomerate lenses reflect discrete depositional events.

Unit 1 is sedimentologically distinct from the underlying black Unit II paleosol. The distinction between the black Unit 2 paleosol and the gray Unit 3 paleosol is not as certain. They may be distinct, or they may be B- and C- horizons, respectively, of a single paleosol. The description of the mapped Straber soils on the site—deep sandy soils of the uplands—roughly matches with the Unit I deposits; Straber soils may account more accurately for deposits on the high T_H terrace above and to the south of the site.

Artifacts are present in the Unit 2 and 3 deposits. The surface finds of 1996 and 1997 were made along the jeep trail that descends from the high terrace and winds toward Mission Creek. Units 2 and 3 rise stratigraphically southward and outcrop along the trail, below the T_H terrace, where the surface finds were made. This explains, by direct observation, why the site's artifacts and features originated in earlier deposits yet were found in part on the surface and along the ranch road traversing the higher, southern portions of the site.

Huffman's notes included summary conclusions of his geomorphic study at the L. E. Wagner site:

- Artifacts on both the surface and in the excavations are in sandy sediments on which are superimposed a well-developed paleosol (author's note: this is a misstatement of Huffman's own observations above. The artifacts came from clayey deposits, not sandy deposits, and were part of the paleosol, not beneath a paleosol superimposed over them);
- Sediments enclosing surface finds are likely to be equivalent to those in the excavations but (because of the road, etc) they could be older or younger;
- Paleosol development of enclosing sediments is consistent with an Early Holocene age;
- The stratigraphic unit containing the artifacts (units 2 and 3) also occurs in the creek 130+ m northeast of the excavations and therefore it likely covers a substantial area under the terrace in the vicinity of the site; and
- The terrace extends continuously to the Guadalupe River (possibly in two slightly different levels) so that any Early Holocene cultural materials at the site indicate a distinct possibility of there being early cultural materials under the whole lower terrace along Mission Creek; that is, the potential exists along the lower Mission Creek valley for multi-component buried sites spanning the Holocene cultural history of the area.

Huffman also provided a series of recommendations on the site setting and a favorable approach to its excavation. His most critical recommendation was for the sampling of Units 2 and 3 for bulk humate radiocarbon dates. Unfortunately, bulk humate sampling was not conducted during the excavations because the TAS did not have the budget to afford more than the one radiocarbon date; however, charcoal samples appropriate for accelerator mass spectrometry were collected from Feature 3 in the upper deposits of Unit 2. Sample TAS-DGR-2014-1 yielded a conventional assay of 5037 ± 24 years B.P. (see discussion below). These results stand as an initial confirmation that

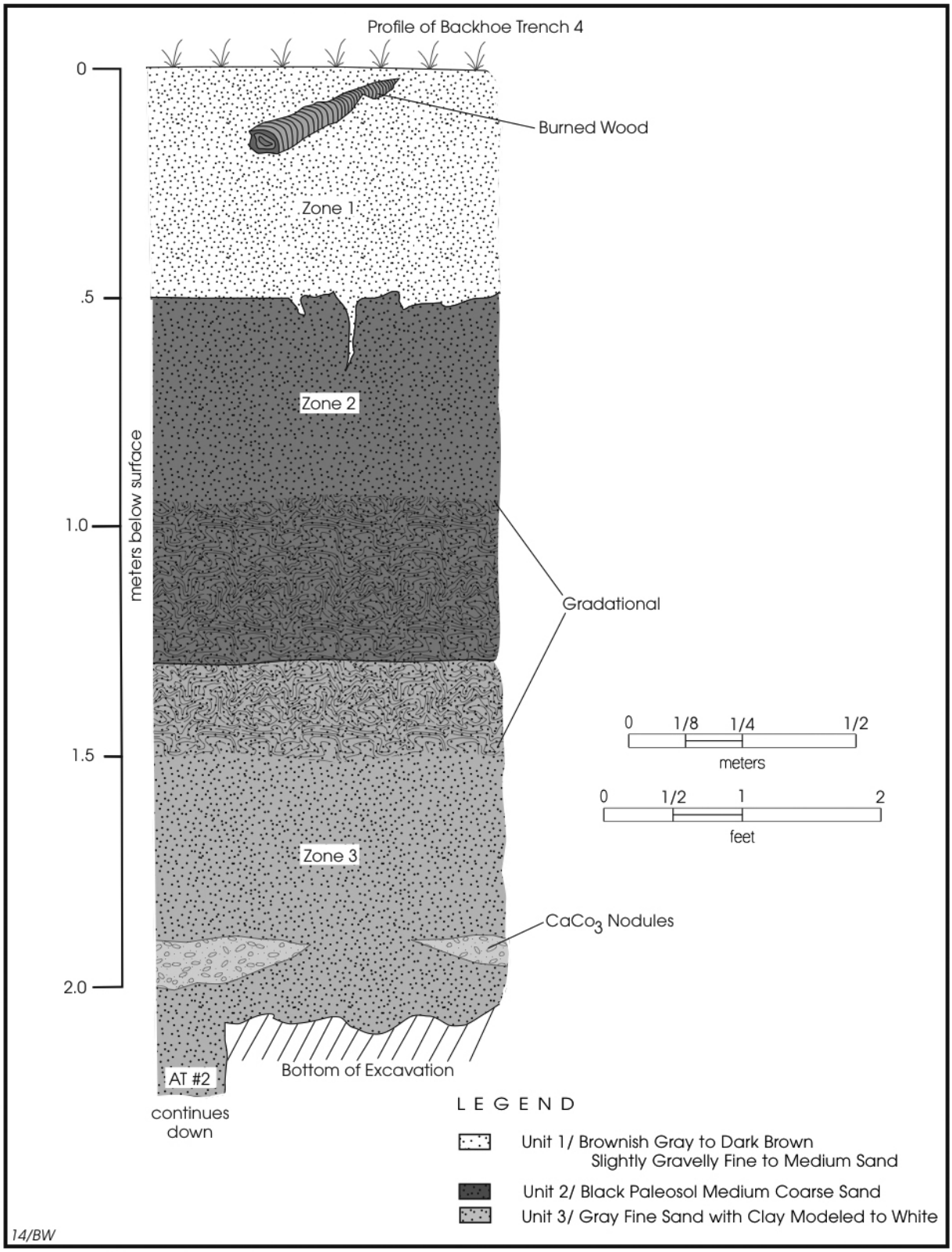

Figure 6. Huffman strat schematic.

the site's paleosol and its extension throughout the lower Mission Creek valley may span most if not all of the Holocene. This finding heightens the inference that the Mission Creek locality may harbor additional early cultural contexts and artifact assemblages.

Local Prehistoric Background

The L. E. Wagner site lies near the boundary of the inland South Texas and coastal cultural regions, and it was anticipated that it may yield features relating to both regions, or at least traits showing known interaction between aboriginal peoples in both regions, such as shell artifacts. This part of Texas has known formal archeological excavations since the 1930s and large cultural resource management (CRM) investigations from the 1970s. Today, work is ongoing, largely in the form of CRM surveys for pipeline and power transmission corridors as part of the new oil and gas development resurgence known as fracking, or petroleum hydrofractionation. A very brief summary of major research efforts and their findings will serve to provide a cultural and temporal context for the site's archeological record.

The site is about 33 km upstream from the Morhiss site (41VT1), one of the most significant sites in this part of Texas. The Morhiss site is on a Guadalupe river terrace, and it was excavated completely in various field investigations between 1932 and 1940. The site leaders at different times included A. T. Jackson, A. M. Woolsey, and W. A. Duffen. Duffen completed the excavations with a large Works Progress Administration crew in 1940 (Campbell 1976:82).

The Morhiss site yielded 250 human burials in the excavations. These finds came from a maximum ca. 3.6 m thick, dark, midden deposit. Constructed features were also found, including fire hearths. A lighter, so-called transitional, zone below the midden deposit contained Paleoindian artifacts and mixed mammal bones, some of them belonging to extinct species. A portion of the Paleoindian cultural materials had been mixed upward into the overlying deposit, apparently by pervasive rodent burrowing on the site. A basal alluvial terrace deposit held washed-in bones of extinct megafauna but no articulated bone sets, no Paleoindian artifactual associations, nor any individual artifacts (Campbell 1976:82). Skeletal and artifactual evidence showed that the Archaic occupants had connections with peoples living on the coast, nearby inland zones, Southeast Texas, and the Edwards plateau of Central Texas. Clear Fork tools and Guadalupe tools were identified as part of the stone tool industry. Some of these tools had asphaltum traces; use of asphaltum as a mastic in tool hafting technology is a Texas coastal cultural trait.

The Archaic peoples at the Morhiss site may have been inland populations that traded with groups on the coast, or they may have been coastal groups who inhabited the site themselves in seasonal migrations and had inland trading connections. Of course, over the long time span of the Archaic period both patterns may have been manifest at the site. Campbell (1976:84-85) suggested that every time period of the Archaic may have been represented at the Morhiss site. Given this possibility, the L. E. Wagner site and the Morhiss site may have had contemporary occupations on brief seasonal bases.

Fox and Hester (1976) conducted a site survey in the Coleto Creek drainage southwest of the L. E. Wagner site. They located 49 prehistoric and historic sites and pointed out that Paleoindian artifacts were found well upstream in the Guadalupe River drainage at least into Dewitt County and the Cuero I Reservoir, where 352 sites of all types were found (Fox and Hester 1976:6; Fox et al. 1974; Birmingham and Hester 1976). The Coleto Creek project was comprised of surface survey only; temporal attributions of the sites were difficult to make. Surface diagnostic artifacts included a range of Archaic period stone tool types and a few Paleoindian period projectile points. Clear Fork and Guadalupe tools were found, but were relatively rare (Fox and Hester 1976:72).

The follow-up test excavations of 17 of the 49 discovered Coleto Creek reservoir sites accentuated the findings of the surface survey: a heavy Archaic period archeological record with a few Paleoindian traces and a very minor Late Prehistoric presence (Fox et al. 1979:61-63). Further excavations were recommended at two sites in the reservoir, and these recommendations were implemented at one of the sites, 41GD21. The site was redesignated as two sites, 41GD21 and 41GD21A, due to its spatially extensive nature (Fox 1979).

The focal research at these sites was carried out in 1977 and 1978 with an emphasis on settlement-subsistence studies and chronology. The collection of samples for radiocarbon dating of the components was a priority (Fox 1979). The 41GD21 excavations included a number of backhoe trenches that exposed several creek-side soil profiles. Notably, the exposures revealed no paleosols such as exist at the L. E. Wagner site (Fox 1979:13-26). The trenches and hand excavation units exposed four major soil

zones that were consistent and correlated across the two site areas. As well, they contained major Late Archaic and some Late Prehistoric artifact assemblages. The Late Prehistoric materials were dominant in the upper deposits of Zone A. Deeper deposits in Zone A returned a radiocarbon assay of 2670 ± 370 years B.P. (TX-2925). Archaic artifacts were abundant in Zone B. Early Archaic period cultural materials were found in the lower deposits of Zone B, including Bell, Bulverde-like, and Refugio projectile point types and one problematic Uvalde point. Zone C below lacked diagnostic artifacts but contained some cultural deposits; Zone D very likely accumulated before humans were present in the region. Two radiocarbon assays supported the Early Archaic attribution of Zone B: TX-2926 yielded an uncorrected date of 4550 ± 190 years B.P., and sample TX-2924 yielded an uncorrected date of 4260 ± 250 years B.P. (Fox 1979:65). The interpretation of Zone B is that it was a cumulic soil with archeological materials of Archaic period age.

Fox argued from the archeological data that the site inhabitants formed a small group whose subsistence pattern emphasized tributary stream resources (Fox 1979:68). A few minor asphaltum-marked artifacts in the 41GD21 artifact assemblage showed coastal contacts or travels, and the significant proportion of deer bones in the faunal assemblage demonstrated the contribution of venison to the diet. Site occupations most favorable to deer hunting would have been the spring, summer, or fall (Fox 1979:70-71).

Recent excavations of the Early Archaic burial site of Buckeye Knoll (41VT98) have revealed a site in the Guadalupe River floodplain relatively near the Morhiss site (Ricklis 2011). The site is similar in character to the Morhiss site, but it was investigated with a consistent effort, advanced chronological techniques, and thorough publication (Ricklis 2011). Perhaps as many as 200 burials were interred there over a period from ca. 7500 to 6200 years B.P. (Ricklis 2011:39, 43). Thus, the cemetery dates to the Early Archaic period, although it is earlier in time than the occupation of the L. E. Wagner site.

The site's setting is an eminence above the Guadalupe River floodplain approximately 15 km upstream from the mouth of the river. Stable isotope analysis of the burials provided evidence of ancient diets mixed between coastal and inland resources (Ricklis 2011:46). This finding supports a settlement-subsistence model of seasonal migratory rounds by aboriginal groups between coastal and inland resource zones.

Excavations at the L. E. Wagner Site

Backhoe Trenches (BHTs)

As stated above, exploratory backhoe excavations were carried out before the TAS hand excavation teams visited the site. One photograph of the backhoe operations is dated March 1998. The machine-excavated trenches were placed in areas known to have yielded cultural materials. Although termed trenches, the BHTs had varying dimensions in plan and were excavated to varying depths. Direct notes on the BHTs are lacking in the TAS records of the site. Specific information on the BHTs derives from hand excavation unit notes, site notes, sketch plans, and general excavation photographs.

Backhoe Trench 1. This BHT lacked any record or photograph. Further, no plan or excavation note made any reference to BHT 1 or its location, nor can any photograph of the backhoe operations allow a reasonable guess as to its nature and position on the site (but see description of BHT 3 below). Any recorded information about BHT 1 is presumed lost.

Backhoe Trench 2. BHT 2 was located a few m south of the unpaved ranch road (see Figure 1). This position lay within the area where surface artifacts had been collected in 1996 and 1997. The BHT measured approximately 3 m east-west by 5 m north-south. The overall depth of the BHT was 40 cm from the ground surface. Hand excavation took place immediately east of BHT 2 and adjacent to it. This 1 x 1 m excavation was TU 9, in which Feature 3 was found. TU 10 measured 1 x 0.6 m in size and was located east of and adjacent to TU 9. It was excavated to fully expose Feature 3.

Backhoe Trench 3. BHT 3 was located a few m north of the unpaved ranch road where the lower terrace flattened out (see Figure 1). The main body of the excavation measured approximately 4 x 8 m in size. Photographs show that the BHT was excavated to about 1.3 m in depth.

A 2 m extension northward from the northwest corner of BHT 3 may have been an earlier excavation from which BHT 3 was extended. Speculatively, this extension may have been BHT 1, about which nothing was recorded. Steps were dug down into the BHT 3 trench from its southern edge, creating a minor extension of the center of the trench wall to the south.

BHT 3 was the principal locus of the TAS excavations at the L. E. Wagner site. Two blocks of four contiguous 1 x 1 m hand excavation units were placed on the floor of BHT 3. These were excavated and recorded as TU 1-8.

Backhoe Trench 4. BHT 4 was excavated along the eastern edge of BHT 3. The extension was a single bucket width wide, approximately 40 cm, and it was excavated below the floor of BHT 3 about 20 cm. The main purpose of this BHT was to cut a fresh face in the terrace deposits to enable clear site deposit profiling. The site soil profile was later recorded along this face (see Figure 3). The backhoe later also excavated a 4 m strip along the eastern edge of BHT 3, designated BHT 4.

Hand Excavation Units and Cultural Features

After the backhoe trenches were excavated, the TAS crew placed an array of 1 x 1 m hand excavation units, termed test units (TU). Called excavation or grid squares in common parlance, the TU corresponded to the metric grid system, aligned to magnetic north, imposed on the site by a total data station surveying system. The individual test units received a sequential number designator (1-10 over the entire site). TU 1-8 were also designated on their southwest corner by their site grid coordinate (Table 1).

The principal TU array consisted of two blocks of four contiguous test units, each forming a 2 x 2 m square. The two blocks were offset 1 m from each other in the bottom of BHT 3 (Figure 7). Surveying instruments measured the dimensions and elevations within the TUs and all objects within them. A datum at the ground surface outside but near BHT 3 provided the origin for all measurements. The datum at the ground surface was declared arbitrarily to lie 100 m above the site elevation plane. By this scheme, all elevations taken would have positive values, but they would decrease in value as the excavations deepened. Placement of the array of TU in the bottom of BHT 3 followed the site excavation strategy of uncovering and defining the earliest cultural occupations at the site.

TU 9 and TU 10 varied from this pattern. They were placed on the current ground surface east of BHT 2 and aligned with it. BHT 2 was excavated before the site grid system was established, and therefore it is not aligned with the site grid system (Figure 8). For this reason, the two TU are not grid squares, but are off-grid and of varying dimensions. In order to relate them to the grid system, their corner points were measured as point proveniences, making them exact points within the grid system, but not as 1 m grid coordinate points. This variation from the usual site gridding procedure is because the test units were established expediently for pressing excavation needs, not simply for correspondence with the grid. As these units produced Feature 3 and the radiocarbon samples that ultimately helped to understand the character of much of the site, their placement choices are considered in retrospect to have been wise and thoughtful and in keeping with the site excavation goals.

Table 1. Summary of test unit excavations at the L. E. Wagner site (41VT128).

Unit	Dimensions	Grid designation	Finished levels	Features/Artifacts	Notes
1	1 x 1 m	N50E50	4	-	-
2	1 x 1 m	N50E51	4	Feature 1, L2	Feature 2, L3, mussel shell cluster, later delisted
3	1 x 1 m	N51E50	5	-	-
4	1 x 1 m	N51E51	5	-	-
5	1 x 1 m	N51E53	1	-	-
6	1 x 1 m	N51E54	4	Guadalupe tool, L4	-
7	1 x 1 m	N52E53	4	Clear Fork tool, L4	-
8	1 x 1 m	N52E54	2	-	-
9	1 x 1 m	-	2	Feature 3, L2	Stemmed point, L1; Unstemmed point, L2
10	1.0 x 0.6 m	-	2	-	-

L=level

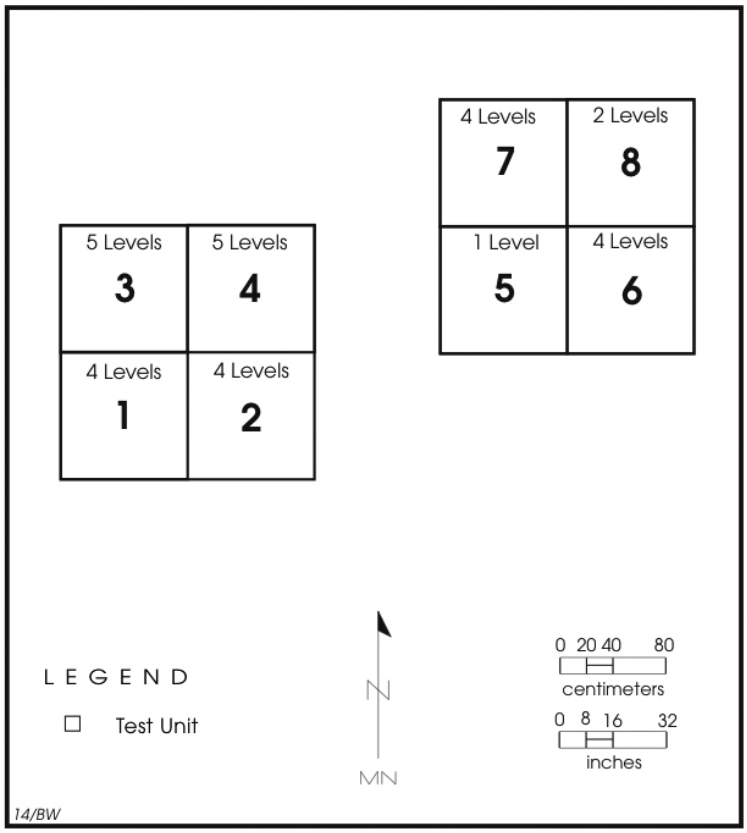

Figure 7. Plan map of test units.

Figure 8. Excavation of TU 9 and 10 in progress at the L. E. Wagner site.

The excavation of the units proceeded slowly due to the hardness of the soil fill in all the units (Figure 9). To account for this, level excavation was by handpick and shovel rather than trowel and brush. The hard fill was broken thoroughly with the heavier tools before transport to the screens. The actual screening process in the 1/4-inch mesh screens consisted largely in sorting the clod-like dirt masses and breaking them up further. After a thorough examination of the screen contents, the screens were necessarily dumped, and consequently a majority of the fill did not pass through the wire mesh. This exigency and the expedient solution unavoidably introduced a recovery bias against smaller cultural items. Despite awareness of this bias, no obvious gaps or aberrant patterns were observed or noted in the analysis of the artifact assemblage. Altogether the surface examinations, backhoe trenches, and test unit excavations were considered to have been sufficient to recover a representative sample of the cultural assemblage preserved at the L. E. Wagner site.

Test Unit 1. The fill of Level 1 took more than a day to remove, and it was entirely the grayish-black, clayey, and sandy loam of Unit II in Huffman's description. Level 2 was of identical character, and it had a very small amount of lithic debitage. Level 3 continued similarly, containing a few pieces of the debitage noted as being in vertical orientation in the soil matrix. Level 4 had a large core and two large chert flakes, one of which was vertical in orientation; the other was flat-lying. Level 4 was the last level excavated in the unit.

Test Unit 2. Level 1 was finished in the hard clayey sand on the second day of excavations. The Level 1 recovery was seven small chert flakes with a few river cobbles. The upper 4 cm of Level 2 returned two chert flakes in vertical position (i.e., their edges were perpendicular to the ground surface). Continued digging in Level 2 exposed a cluster of chert flakes and river pebbles and cobbles of mixed size that formed a rough semi-circle about 20 cm wide. The cluster was designated Feature 1. Feature 1 is a cluster of varying sized rocks, flakes, two pieces of mussel shell, a probable core, and a thin biface (Lot 37) in an area about 20 cm in diameter and 6 cm thick. The lower portions appeared flat-lying and did not conform to a basin or a slight pit. Some of the larger flakes higher in the feature were oriented on edge. The Lot 37 biface came from under the feature near the bottom of Level 2. The absence of observed evidence of burning precludes any interpretation of the feature as a hearth or other firing feature. The best interpretation of the feature is that it is the remains

Figure 9. Excavation of test units in progress in BHT 3.

of an activity surface with cultural items and residues and additional cultural materials washed into it when the campsite was still open. The rest of Level 2 contained a low density of lithic debitage and small river pebbles.

Feature 1 continued into Level 3 an indeterminate depth in the form of river pebbles. A cluster of mussel shells in the southwest quarter of the unit was recorded as Feature 2 in Level 3. A total of 10 shells formed the feature. Level 4 returned a few mussel shells possibly belonging to Feature 2; otherwise, the level had increasing amounts of river pebbles and gravels, as in the corresponding levels of TU 3 and TU 4 (see below). An in-field interpretation was made at this point that TU 2 and adjacent excavations had descended upon an ancient rill or gully filled with a minor rocky bed load, none of it likely to be cultural material. The excavators reasoned that the clustering of the mussel shell forming Feature 2 was by alluvial action, not human agency; and the feature was undesignated, or delisted, on this basis. The material here and its context comprised one of the local conglomeritic lenses mentioned by Huffman. Level 4 was the last level excavated in Unit 2.

Test Unit 3. Level 1 began in the typical grayish-black clayey sandy fill of Unit II. Artifact recovery was lacking in the exceptionally hard deposit. Level 2 had two large chert flakes, both of which were on edge. Also in Level 2, the sediments showed a distinct soil change to a gray and whitish mottled deposit, with the white deposit formed of snail shells and caliche streaks and nodules. Huffman described localized pebble conglomerates and caliche streaks in depositional Unit III, and the soil change in excavation TU 3, Level 2 may be one such lens. Level 3 had a large chert flake oriented vertically. The unit's hard, lighter-colored fill continued through Level 4 but artifact recovery was negligible. Level 5 was finished with little in the way of cultural materials but with large amounts of river cobbles and shell fragments. Level 5 was the last level excavated in the unit.

Test Unit 4. Level 1 was the hard grayish-black clayey sandy deposit of soil deposit Unit II, similar to neighboring TU 3. Artifact recovery in the level was one small lithic flake. Excavations to the bottom of Level 2 showed a lightening of the deposit due to the increase in snail shells, caliche nodules, and light burrow fills as noted in TU 3. The fill remained very hard and was almost impossible to screen. Level 3 was begun, benefiting from an overnight rain shower that softened the deposit, and it was finished with the significant recovery of river pebbles and small chert debitage pieces, all of which appeared to be unburned. Level 4 had another large flake on edge, and the deposits continued to yield significant amounts of river pebbles, caliche nodules, occasional shell fragments, and a few small chert flakes; it also had a large flat-lying chert flake. Level 5 had a large well-made stone scraping tool oriented on edge and increasing amounts of river pebbles and cobbles as with Level 5 in adjacent TU 3. Level 5 was the last level excavated in the unit.

Test Unit 5. The unit was excavated only to the bottom of Level 1, entirely within soil deposit Unit II. The artifact specimen inventory indicates a complete lack of recovery in the level. The press of time in the test excavations prompted a decision to shift efforts to potentially more informative excavations.

Test Unit 6. Unit 6 was excavated through four levels. The unit, through Level 2, yielded a very small amount of pebbles, a few pieces of lithic debitage, and six pieces of fire-cracked rock. These classes of material declined in recovered amounts through levels 3 and 4. A quartzite hammerstone cobble (with battering on both ends) was recovered in Level 4, as well as a fragmentary Guadalupe tool (Lot 55). Level 4 was also the last level excavated in the unit.

Test Unit 7. The unit was excavated through four levels, beginning in soil Unit II. Artifact recovery was exceedingly light through three levels, amounting to a few pebbles and pieces of fire-cracked rock. In the fourth level, however, the artifacts included 15 pieces of lithic debitage, four mussel umbos, nine pebbles, and one fragmentary Clear Fork tool later inventoried as an untyped tool fragment. Level 4 was also the last level excavated in the unit.

Test Unit 8. Unit 8 was excavated through two levels in sedimentary unit III, which may be a subhorizon of Soil Zone II. In keeping with the neighboring units, recovery included a small amount of river pebbles and lithic debitage, with proportionally more pebbles than debitage. Additionally, in Level 2 six fire-cracked rocks were found. Level 2 was the last level excavated in the unit.

Test Unit 9. Unit 9 was placed immediately east and adjacent to BHT 2. The recovery of artifacts during the cleaning of the profile of the backhoe trench suggested an enhanced potential for recovery of diagnostic artifacts and cultural features, and TU 9 was placed there accordingly. Level 1 had 13 snail shells and two lithic flakes. Level 2 contained a rock hearth, designated Feature 3 (Figure 10). The densest part of the feature was

approximately 50 cm in diameter with scattered, dispersed, rock extending an additional 50 cm in all directions. A charcoal sample for radiocarbon dating was collected from the feature; the carbonized material was apparently from the stems of woody plants. A stemmed dart point (Lot 49; Williams point) and an unstemmed dart point were both found in the feature fill. Level 2 was the last level excavated in the unit, and the work ended with the plan mapping of the feature.

Test Unit 10. The unit was located immediately east of TU 9 and adjacent to it. It was placed to determine the possible limits of Feature 3, centered in TU 9. The unit was excavated to focus on the exposure and clearance of Feature 3, and this effort ceased at what was the bottom of Level 2. The sediments in TU 10 included components of Feature 3: 19 pieces of sandstone, 37 snail shells, and 61 river pebbles. One piece of limestone or marl that contained a clastic silicate pebble was also found, a natural particle of the river terrace system. Also, six fragments of red ochre were identified in deposits. These feature-related materials were items dispersed from the constructed hearth feature and were not in situ feature elements. No further excavation was conducted in the unit.

Spatial Analysis

Spatial analyses were conducted to investigate possible associations among the contiguous and near-contiguous test units (TUs 1-8) dug in BHT 3. The figures provided below are composite plans of one level in all the eight excavated test units, as the beginning elevations of each 10 cm level were effectively the same, the hand excavations having begun on a flat backhoe-excavated surface within Zone II deposits in BHT 3. Therefore, the test unit-to-test unit comparisons equate to each other and the natural stratification as well.

The Level 1 composite plan shows no features or artifact clusters (Figure 11). Material culture remains were generally light and variable in density. The quantities were so low in TU 4 and TU 5 that debitage and pebbles were noted, but nothing was collected. No artifacts were collected from TU 7.

The Level 2 plan shows Feature 1 in TU 2 and a higher density of associated artifacts and debris (Figure 12). Feature 1 had a ring-like zone of more cultural debris in a 30 cm wide area around the mapped limits of the feature. Mapped and unmapped cultural materials defined the zone, not soil discoloration. River pebbles were the most commonly collected items in the zone, followed by 36 pieces of lithic debitage. An indistinct zone or lens of darker clay and snail shell particles was encountered in the western one-third of TU 3 (Figure 12). TU 6 had plentiful flakes and debris, but without any defined spatial clustering. A small cluster of unmodified river pebbles was noted in the northwest quadrant of TU 8; this may have been a very minor fluvial conglomeration.

The Level 3 plan shows significant clustering of diverse cultural and unmodified materials in TU 2 as well as the natural clustering of the mussel shells originally classified as Feature 2 (Figure 13). There are higher counts of debitage and pebbles in TU 4, but none of the items were mapped there. TU 3 had one point-plotted chert flake and 60 recovered river pebbles. Elsewhere, artifact densities were low, and there were no other point-plotted items. The higher densities of material in TU 2, Level 3, are most likely the vertical extension of Feature 1 in Level 2; there was no stratigraphic separation between the materials in levels 2 and 3, and they apparently were component items of a single activity area or occupation level associated with Feature 1. The thickness of this deposit was a maximum of 15 cm.

In Level 4, areas of higher artifact density were in TU 4: this included two clusters of pebbles, flakes, and rocks (Figure 14). TU 6 had a hammerstone but few other cultural materials. A Guadalupe tool (Lot 55) was recovered in TU 7, along with low amounts of other cultural materials. Both TU 6 and TU 7 had lesser amounts and densities of cultural materials than did TU 4 to the west.

Only TU 3 and TU 4 were excavated to Level 5. Moderate densities of cultural materials continued to be found in the lowest level, including a cluster of a few items, including a scraper (Lot 33), n the east-central area of TU 4 (Figure 15). Excavations to Level 5 did not reach the base of the archeological deposit, but were stopped due to logistical concerns and scheduling of the TAS Field School.

Stratigraphic Analysis

As mentioned, hand excavations in the array of eight test units began in Zone II. It was noted that starting in levels 4 and 5 in the northern squares of the array, TUs 3, 4, and 7, fill became a lighter brown than the blackish-brown of overlying levels.

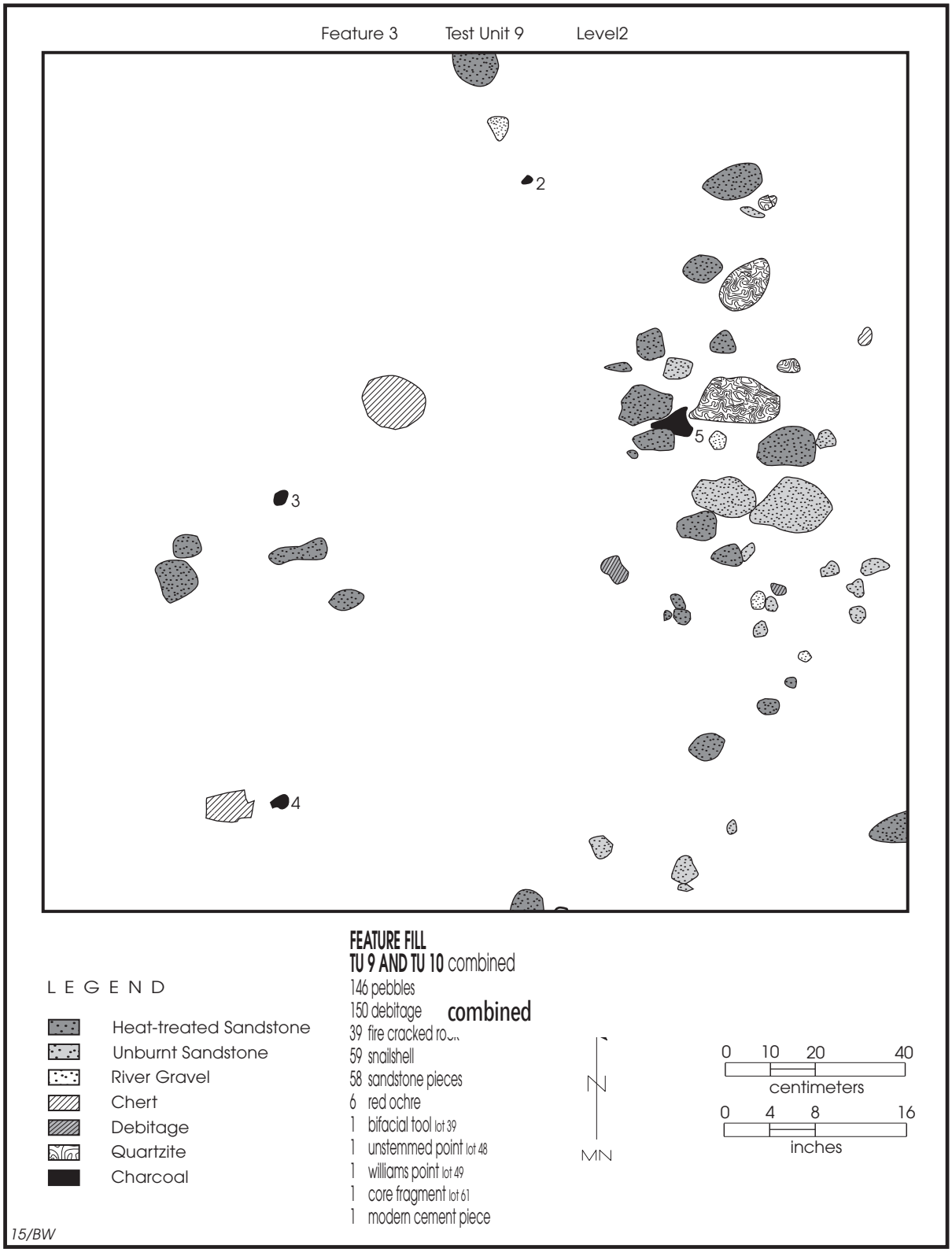

Figure 10. Feature 3, TU 9, level 2 at the L. E. Wagner site.

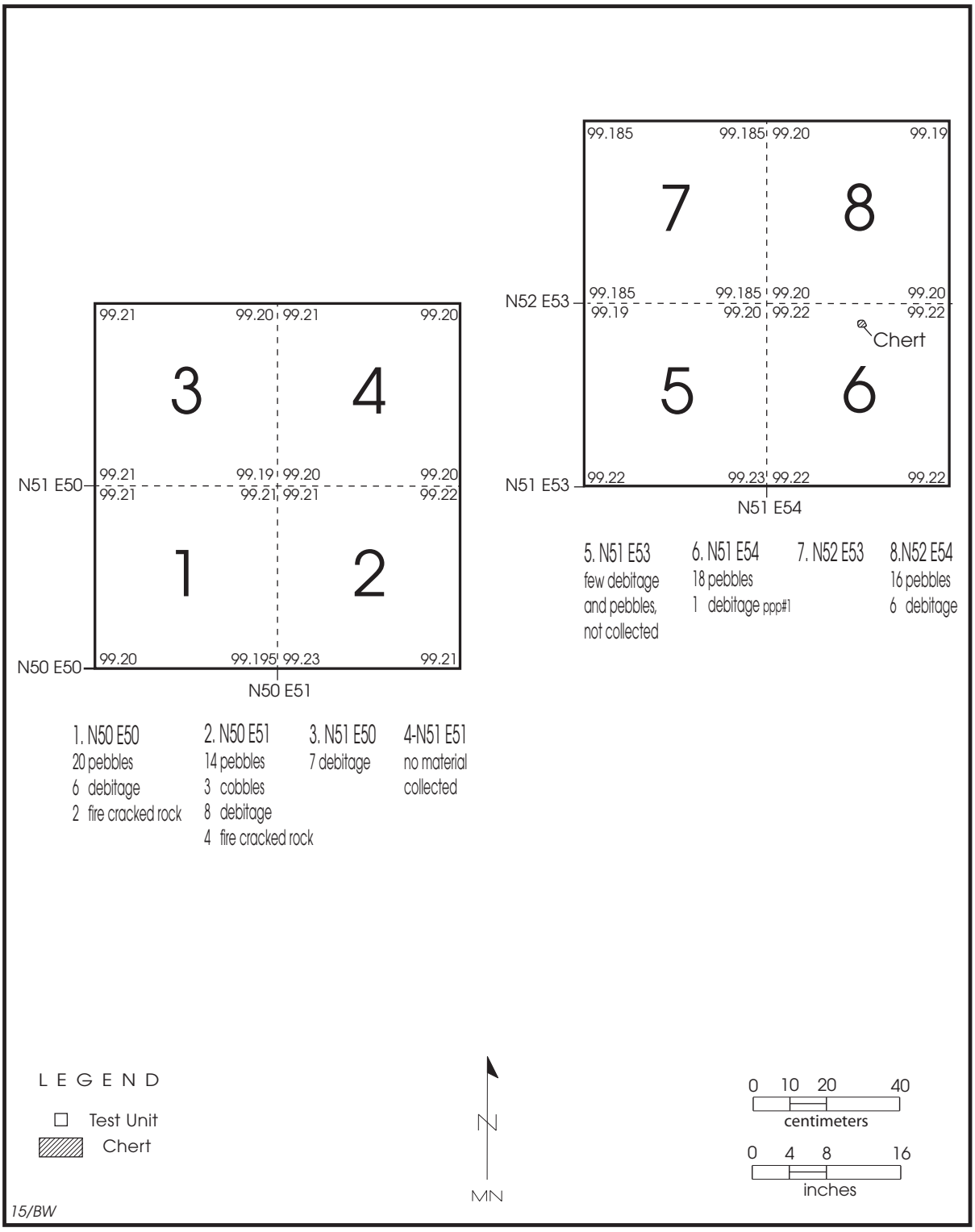

Figure 11. Composite Level 1 excavations.

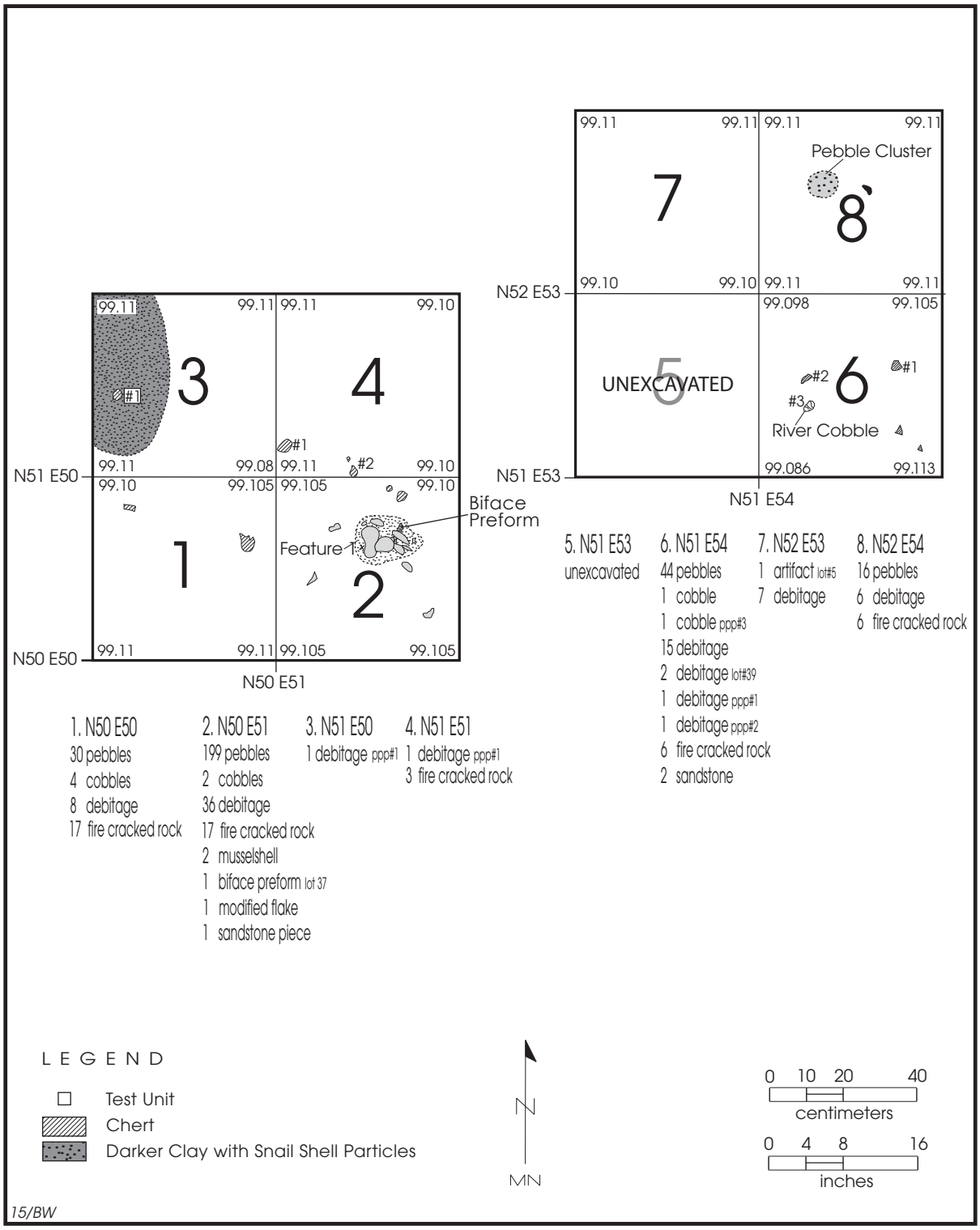

Figure 12. Composite Level 2 excavations.

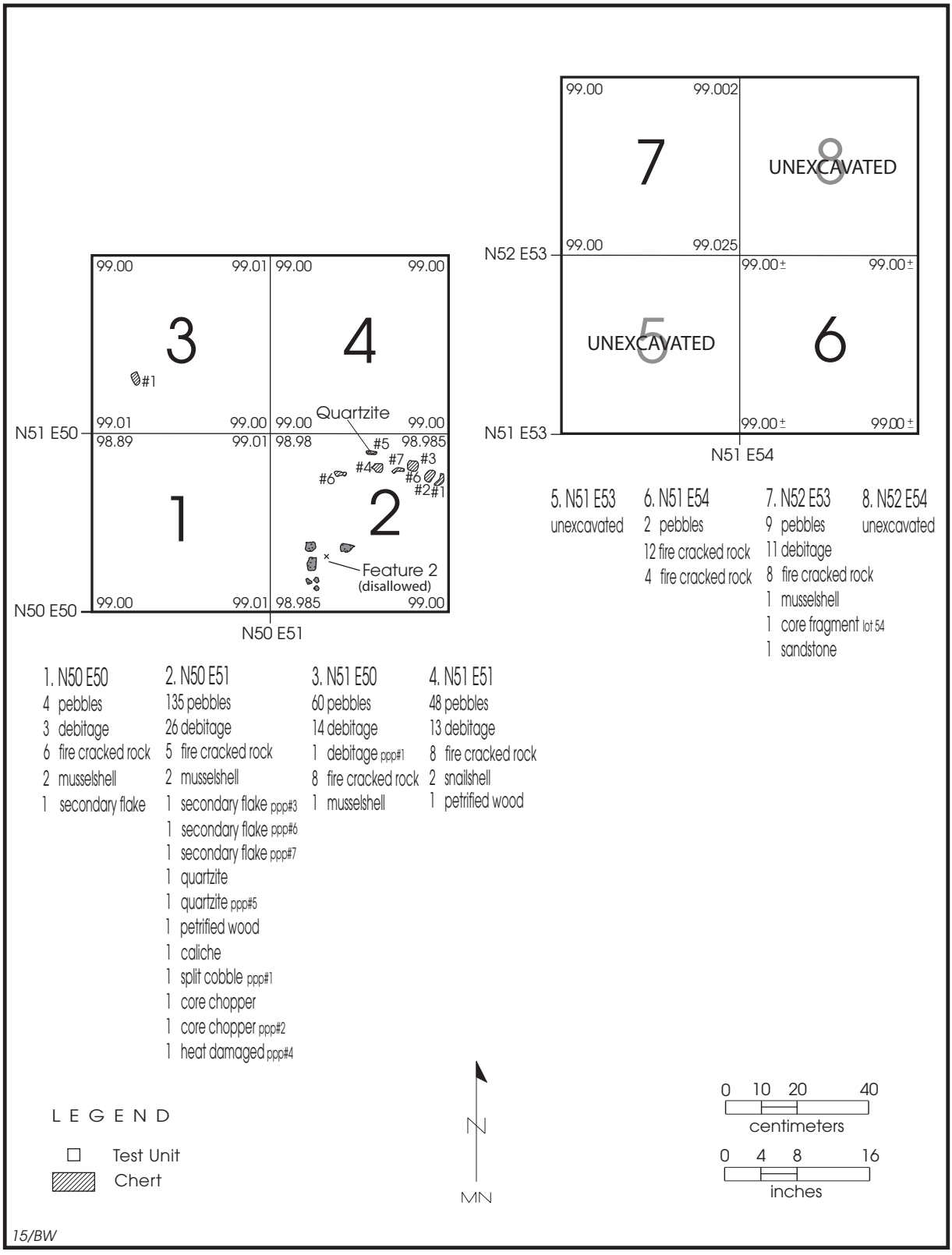

Figure 13. Composite Level 3 excavations.

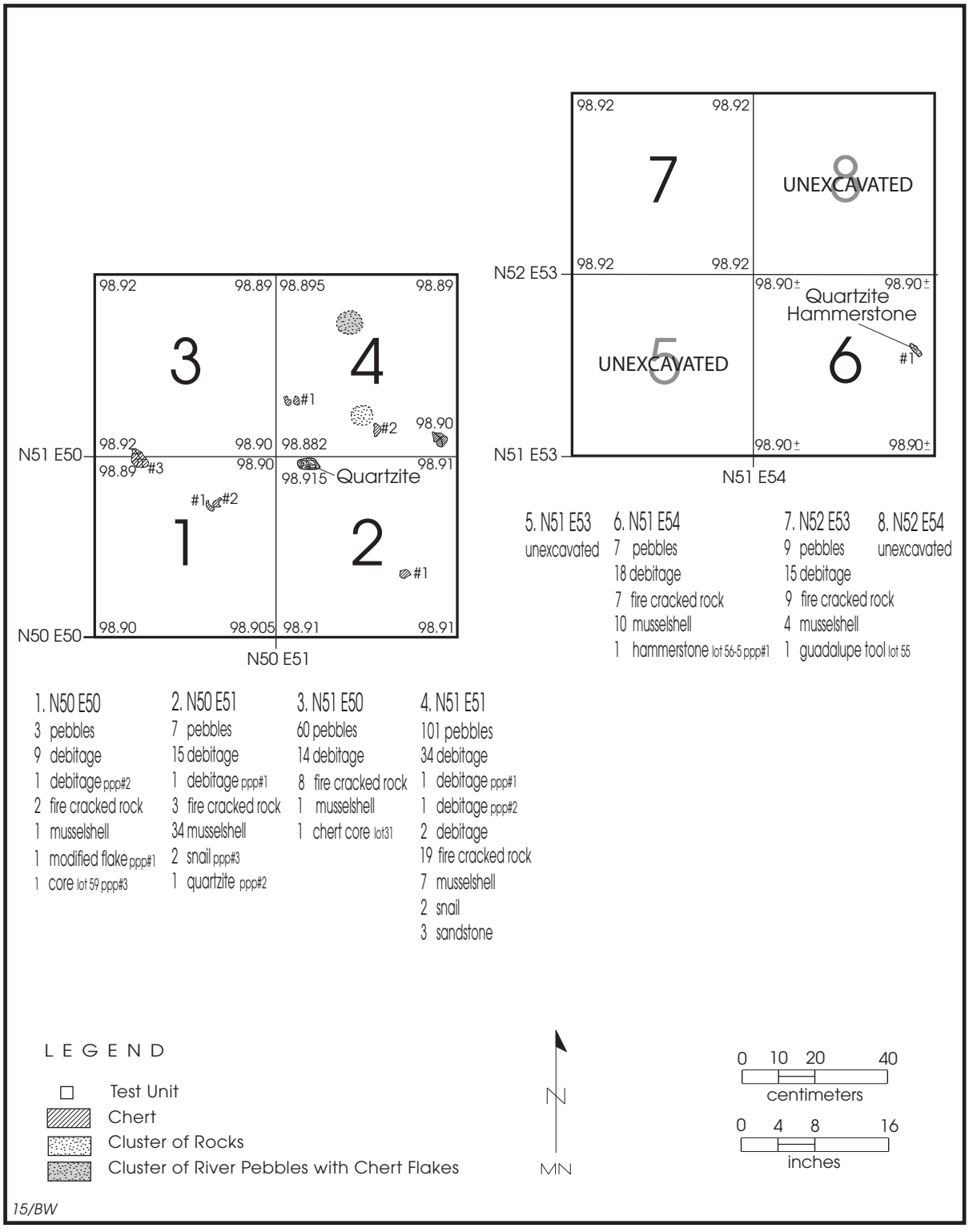

Figure 14. Composite Level 4 excavations.

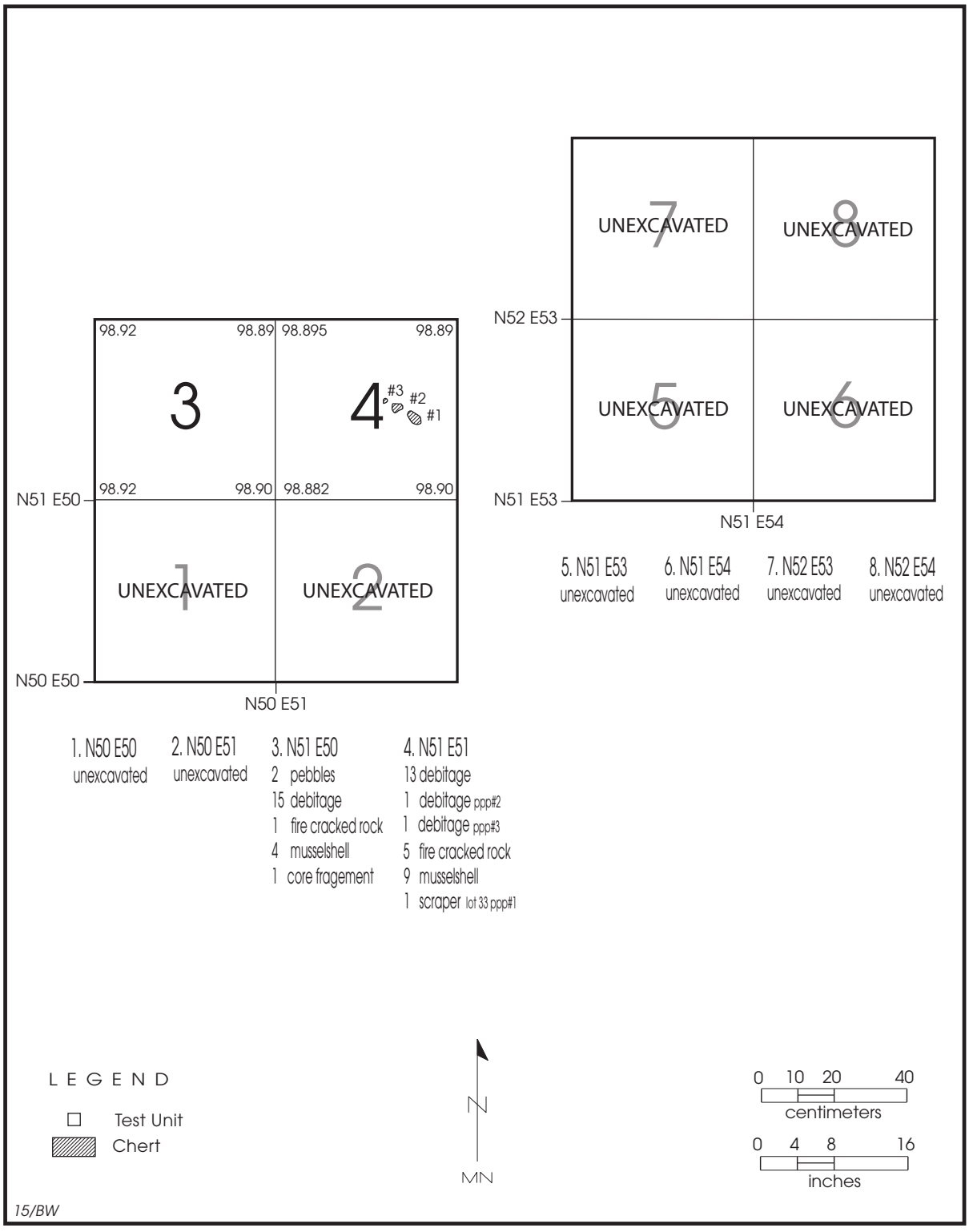

Figure 15. Composite Level 5 excavations.

Geologist Huffman noted that the transition between Zone II and the underlying Zone III was gradual and that Zone III was a lighter color than Zone II. The observations of the color change may reflect this gradual transition; hand excavation identified no other breaks or discontinuities in stratification.

The cultural debris of sites is informative for its distributions as well as its cultural nature. At the L. E. Wagner site, the debris classes of debitage, fire-cracked rock (FCR), and pebbles possess this information potential, although the pebbles may be more informative about fluvial processes than cultural activities. These classes were examined for potential vertical patterns through the stratification in hand-excavated units. The numbers of items of cultural debris were summed for every level and then charted per level in Table 2. Mussel shell was not so summed as it was extremely discontinuous across the units.

Table 2 indicates that all three classes of material are concentrated in levels 2-4. A comparative measure of material densities was computed by dividing the numbers of items by the number of units excavated across levels: Level 1 yielded 3.5 items of debitage per unit, 0.75 FCR, and 8.5 pebbles; Level 2 contained 8.7 debitage, 7.0 FCR, and 35.0 pebbles; Level 3 showed 11.5 debitage, 7.2 FCR, and 43.0 pebbles; Level 4 totaled 18.0 debitage, 8.0 FCR, and 31.0 pebbles; and Level 5 held 14.0 debitage, 3.0 FCR, and 1.0 pebbles. By this measure, debitage was densest in Level 3, FCR was most abundant in Level 4, and pebbles were most frequent in Level 3. A slight tailing off of the density of materials may be indicated in Level 5, but only two units were excavated in that level. Even given the apparent fluctuation of amounts of cultural debris in archeological deposits, their overall concentration in hand excavations was low.

Artifact Assemblage

Chipped Stone Tools

Clear Fork Tools. Clear Fork tools (Turner and Hester 1999:246-249) were the most common of any formal-named tool type: there are five specimens from investigations (Table 3 and Figure 16), inclusive of the 1997 surface survey. The L. E. Wagner site specimens were part of a use-wear study by Dale Hudler, and that study is reprinted below from its original publication in the 1998 TAS Field School Handbook. Specimens of this tool type, regardless of manufacturing variations, have in common a strong, high edge-angle working edge, or bit, at the distal end of the working piece. Research, accordingly, has focused on the implied functions of the tool type.

Clear Fork tools most likely functioned in woodworking activities with the tool bit applied to material in a scraping action (Hester et al. 1971), but there is evidence of additional uses (see Hudler, below). In varying forms, Clear Fork tools were used from Paleoindian times into the Middle Archaic period, and are found mixed in Late Archaic contexts (Turner and Hester 1999:246). The tool type is a common marker of Early Archaic period components (Collins et al. 1998:224; Thoms 2007:365), and its spatial distribution is very wide, ranging from Northwest Texas through Central and South Texas and into northeastern Mexico. Similar tool forms have been found as far away as South Dakota (Black and Highley 1985; Hughes 1980), although these distant outliers may be examples of independent invention and typological convergence.

Table 2. Summation of counts of debitage, fire-cracked rock (FCR), and pebbles by excavation levels, TU 1-8.

Level	No. of excavated units	Debitage	FCR	Pebbles
1	8	28	6	68
2	7	62	49	245
3	6	69	43	258
4	6	108	48	187
5	2	28	6	2
Totals		295	152	760

Table 3. Clear Fork tools.

Lot	Prov.	L	W	T	Lithology	Bit width	Bit curvature	Overall shape	Bit edge angle
71	BHT 3 fill	80.0	43.0	20.0	Yellow-brown chert	30.0	Slightly concave	Truncated isosceles triangle; whole specimen	79º
73-9	1997 surface	69	48.9	15.2	White chert	48.1	Slightly convex	Fat teardrop	69º
73-10	1997 surface	79.3	45.1	17.3	Brown chert	39.2	Slightly convex	Teardrop	77º
73-11	1997 surface	56	44.2	12.6	Petrified wood	41.9	Outline convex, bit concave	Triangle with convex edges	62º
74-18	1998	72.8	65.0	16.2	Tan granular surface chert	55.1	Convex-Convex	Isosceles triangle with straight sides	73º

All linear measurements in mm; Prov=provenience; L=length; W=width; T=thickness

Notes on Five "Clear Fork" Tools from 41VT 128

Dale Hudler

Morphology

Chipped stone artifacts with triangular or sub-triangular outlines and steeply beveled working edges or bits were defined as a type by Cyrus Ray, who named the bifacial variety Clear Fork Gouge 1 and the unifacial variety Clear Fork Gouge 2 or Planer Gouge (Ray 1938:198). He later expanded this to six categories (Ray 1941). Since that time, Clear Fork tools have been found to be widespread geographically and to have been in existence for a long time (Black and McGraw 1985:139). Additionally, stone tools with "bits" perpendicular to their long axis (such as the Clear Fork) have been found to have a broad range of overlapping morphologies (Hall et al. 1982:318-348). Thus, Clear Fork has been abandoned as a type (Hall et al. 1982:318-348) since it does not meet Krieger's (1944:278) criterion of having distinct "distributions in space, time, and cultural association." The name Clear Fork, however, has been retained in the literature for descriptive purposes (Turner and Hester 1999:246-249).

Five chipped stone tools from the L. E. Wagner site can be described as Clear Fork tools. Using Ray's typology, four (no number, 9, 11, and 18) would be designated as Clear Fork Gouges type 1 (bifacial tools with a triangular shape), although one (no number, called 0 in the rest of the article) is intermediate between type 1 and type 3 (bifacial tool with a long narrow shape that is nearly the same width from distal to proximal end). One (10) would be designated a Clear Fork Gouge type 2 (unifacial tool with the same shape as type 1). Tool number 0 and tool number 18 have crudely flaked ventral surfaces.

Dating

The earliest bifacial Clear Fork tools from securely dated context are from the Wilson-Leonard site (41WM235) and are dated to 10,000-9500 B.P. (Wilson Component; Michael B. Collins, personal communication, 1997). Hester (1983:104) also has four radiocarbon dates in the 9000 B.P. range for a

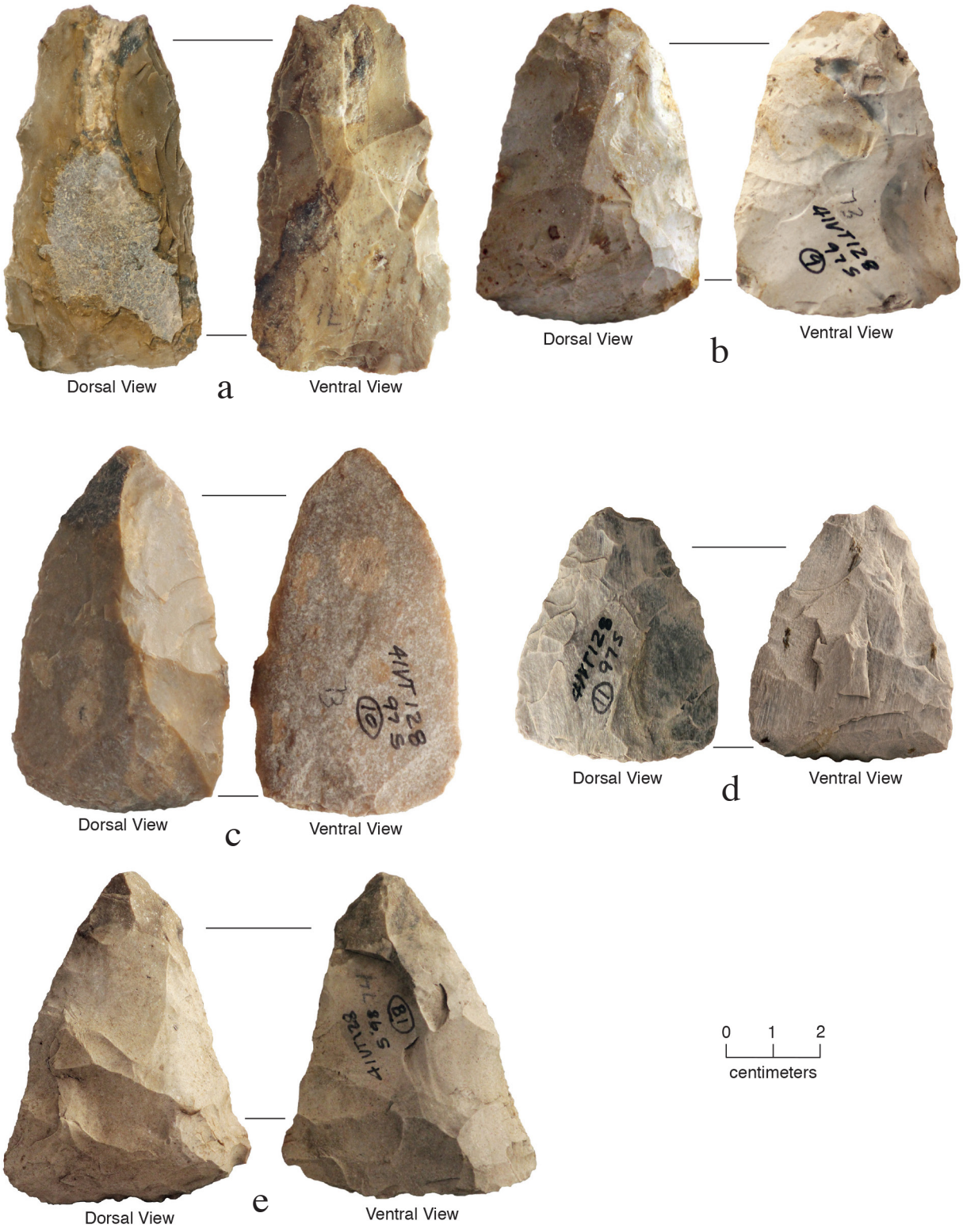

Figure 16. Clear Fork tools, dorsal and ventral views: a, Hudler's 0, BHT 3 fill (Lot 71); b, Hudler's 9, 1997 surface (Lot 73-9); c, Hudler's 10, 1997 surface (Lot 73-10); d, Hudler's 11, 1997 surface (Lot 73-11); e, Hudler's 18, 1998 surface (Lot 73-18).

bifacial Clear Fork tool associated with Golondrina points from excavations at Baker Cave. The earliest dated unifacial Clear Fork tools are also from Wilson-Leonard and have an estimated age of 6500-6000 B.P. (based on cross-dating of diagnostic projectile point types).

Use-Wear

Macro-wear. None of the tools is broken (partial tools with snap fractures are not uncommon). Tool number 0 has moderately large flakes with step and hinge terminations removed from the central portion of the ventral bit face (these flakes have attrited the central section of the bit). I have produced this same effect by using replica tools in an adzing motion on very hard contact materials (seasoned live oak and fresh bone) (Hudler 1997:25-26). Tool number 9 shows patination on both sides and has a few small flakes with hinge terminations removed from the ventral bit face by impact (the flake scars are patinated). Tool number 10 shows moderate patination on the ventral side, and it has a few small flakes with step terminations removed from the dorsal and ventral bit face (small flakes with step terminations caused by final edge retouch during manufacture are frequently seen on the dorsal bit faces of replicas). Tool number 11 shows differential patination (the dorsal side is the most patinated) and has small flakes with step terminations removed from the ventral bit face (a wear pattern seen frequently on replicas). Tool number 18 has some flakes with step terminations removed from the dorsal bit face, but they are not large enough nor concentrated enough to have attrited the bit as was the case for tool number 0.

20X. Tool number 0 has micro-flakes that include step terminations removed from the ventral bit face and light polish on high spots on the ventral bit face. No striations were noted. Tool number 9 has moderate to heavy polish on ventral high spots all the way back to the proximal end and moderate polish on high spots on the dorsal bit face. No striations were noted. Tool number 10 has moderate polish on high spots on the ventral bit face and moderate edge rounding on the bit. There are possible linear features in the polish perpendicular to the bit edge. Tool number 11 has moderate polish on the ventral tool face all the way back to the proximal end and light polish on high spots on the dorsal bit face; no striations were noted. Tool number 18 has moderate to heavy polish on high spots on both the dorsal and the ventral bit face. No striations were noted.

200X. Only one tool has well-developed polish with characteristics that can possibly be related to contact material. The polish on tool number 18 closely resembles polish seen on replica Clear Fork tools used to adze wood. Tool number 9 has well-developed polish but I cannot relate it to a specific material

Interpretation

All of the tools have edge damage flakes with step or hinge terminations suggesting tool use on medium to hard contact materials (Tringham et al. 1974), and tool number 18 appears to have been used as a wood-working tool. Use on hard contact material(s) suggests the tools were hafted to generate the required force (as does the tool morphology). This makes the presence of polish extending from the bit edge to the proximal end on tools 9 and 11 somewhat puzzling and may indicate that the polish is not related to tool use. There is the possibility that these tools moved enough in the haft to cause polish, but this movement would have made the tools less efficient and would not likely have been tolerated.

Guadalupe Tools

A single chipped stone tool of the Guadalupe type was recovered from the screen in the excavation of TU 6 (Table 4), but it was originally identified as a Clear Fork tool; there were also two preform Guadalupe tools from surface collections (Figure 17c-d). The artifact, Lot 55, nevertheless displays the characteristics of the Guadalupe tool (Figure 17e): it is formed on a long core flake and has a distal end bit (Turner and Hester 1999:256-260), usually but not always set on the ventral face of the piece.

The piece is fragmentary, snapped at right angles to the longitudinal axis. The artifact has a definite keel cross-section through the long axis. The time period of use for Guadalupe tools is the Early Archaic period, and perhaps even earlier in time (Turner and Hester 1999:256).

Although the type has been noted in the archeological literature for many years under a variety of names, Black and Highley (1985:142-154) offered the first clear definition and study of the Guadalupe tool. They also identified two different production sequences for the tool, a circumstance rare for any distinctive chipped stone tool type. The area of distribution is smaller than that of the Clear Fork tool, being largely restricted to South Texas and the southern margins of the Edwards Plateau. Notably,

Table 4. Guadalupe tool.

Lot	Prov.	L	W	T	Lithology	Bit width	Bit curvature	Edge angle	Overall shape
55	Screen, TU 6, L4 99.00-98.90	30.0*	43.0	13.6	Light brown chert	38.2	Strong excurvate	52°	Lunate, fragment

Measurements in mm; Prov=provenience; L=length; W=width; T=thickness
*=incomplete.

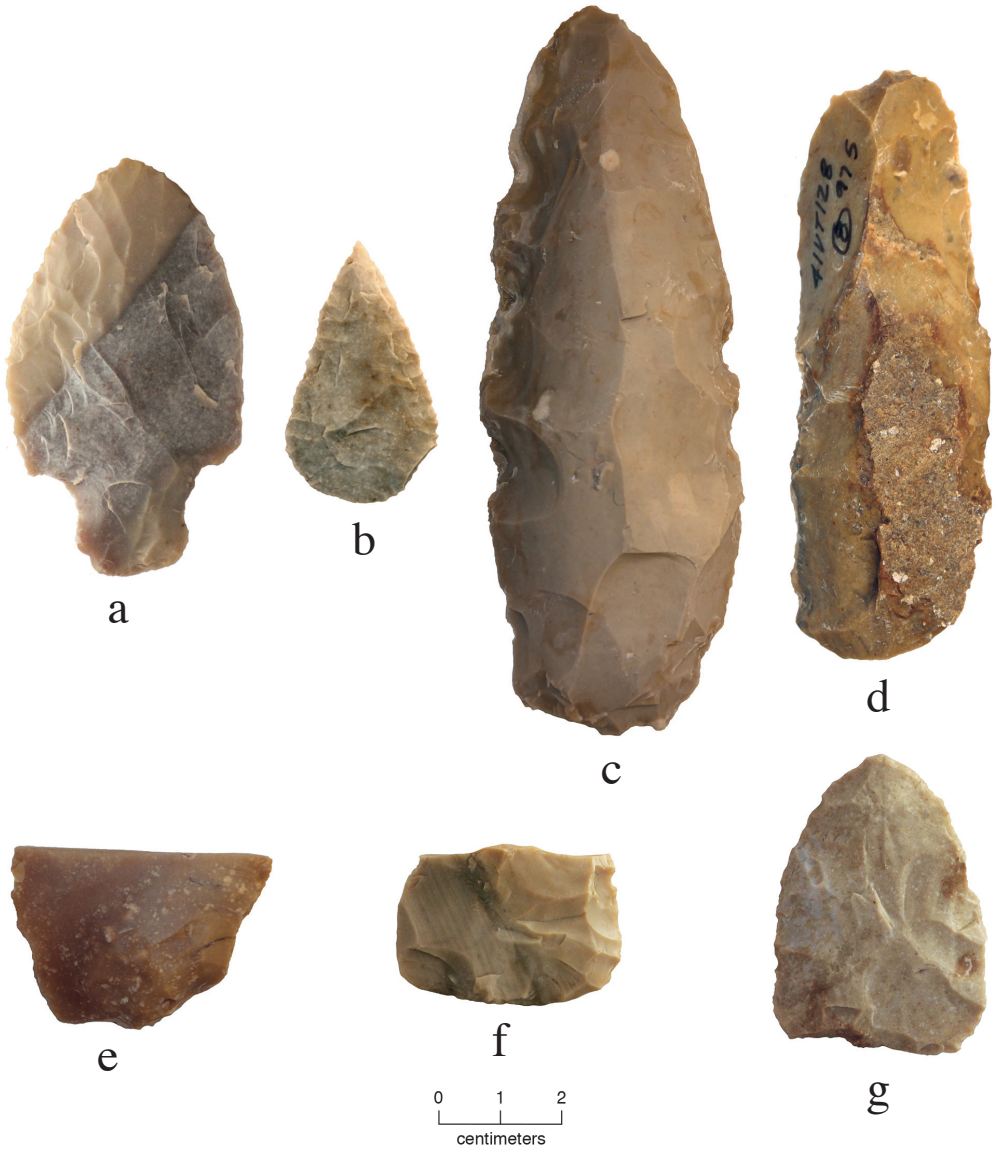

Figure 17. Bifacial tools from the L. E. Wagner site: a, Williams point, Feature 3 (TU 9-L1) (Lot 49); b, unstemmed projectile point, Feature 3 (TU 9-L2) (Lot 48); c, preform Guadalupe tool, 1996 surface (Lot 72-1); d, preform Guadalupe tool, 1997 surface (Lot 73-8); e, fragmentary Guadalupe tool (TU 6-L4) (Lot 55); f, biface base, unknown provenience (Lot 9); g, thin biface, Feature 1 (TU 2-L2) (Lot 37).

the San Antonio River drainage and the middle and lower zones of the Guadalupe River valley are said to be core distribution areas of the Guadalupe tool (Black and Highley 1985:143). Radiocarbon-dated contexts containing Guadalupe tools cluster within the 5000-5500 years B.P. range (Black and Highley 1985:146). An in-depth experimental study of the type (Sollberger and Carroll 1985) produced strong evidence for the use of the tool in defleshing and curing animal hides.

Bifacial Tools—Projectile Points and Preforms

Four artifacts were excavated that appeared to be or were intended to be projectile points. One was finished, and three were preforms or blanks (Table 5 and Figure 17a-b, f-g).

The preforms have extended oval or teardrop outlines, exemplary of South Texas biface manufacture, both for preforms and finished tools. Of particular note is Specimen Lot 48 (Figure 17b) which has a row of flake scars along one edge that appears to represent an attempt to bevel that edge; however, the extreme thinness of the tool prevented any effective beveling. Specimen Lot 49 is a Williams point (Figure 17a; Suhm and Jelks 1962:259-260; Turner and Hester 1999:194-195). The point has the typical corner notching that widens with depth and an unusual pattern of differential patination on either side of a diagonal line across the blade.

Bifacial Tools—Scrapers

Excavation and surface survey recovered four chipped stone scraping tools (Table 6). They are diverse in that they have various outline shapes and originate in cores, flakes, and tablet pieces.

Specimen Lot 61 has a tabular shape and is about 40 percent corticate. Scraping flake scars mark the distal end, on the dorsal face. Lot 73-8 has bifacial scraping wear in the form of both edge-stepping and edge-crushing. Lot 73-14 began in a process of bifacial reduction. A thick mass that resisted removal halted this process, but the piece found use as a scraper at that point; the entire perimeter shows step-fracturing, crushing, and use-flaking.

The lot 72-1 and lot 73-8 artifacts may be considered unfinished or preform Guadalupe tools. They are both bifacially reduced core bifaces; this approach to tool finishing follows the Model 2 production sequence for Guadalupe tools (Black and Highley 1985:148-149). Both specimens lack the flake removal on the end of the flake that would have created the bit end of such tools. The effects of scraping on the artifacts show that they may have been diverted preferentially to scraping functions.

Unifacial tools

Two unifacial scraping tools of chert were found at the site, one from TU 4 and one from the surface (Table 7).

Table 5. Projectile points and preforms.

Lot	Provenience	L	W	T	Type	comments
9	Unknown	26.7	37.0	10.0	Preform fragment	Proximal one-third of perform, yellow-gray chert
37	TU 2, N50E51, L2 99.14	49.4	35.0	6.7	Whole preform	Convex outline; Yellow-gray chert point-plotted
48	TU 9, L2	43.1	25.3	4.4	Unstemmed dart point	Teardrop outline with straight edges
49	TU 9, L1, 100.70-100.60	68.9	39.1	8.4	Stemmed dart point	Williams

Measurements in mm; L=length; W=width; T=thickness

Table 6. Scrapers.

Lot	Provenience	L	W	T	Type	Comments
61	TU 9, L2	54.1	38.1	17.9	End scraper	Scraper edge is 24.6 mm long
72-1	1996, surface	120.1	40.3	25.8	Keeled side scraper	Extended teardrop shape in plan; preform Guadalupe tool
73-8	1997, surface	97.4	33.2	19	Side scraper	20 percent corticated; preform Guadalupe tool
73-14	1997, surface	66.8	44.5	15.5	Preform blank	Teardrop outline; preform diverted to scraping

Measurements in mm; L=length; W=width; T=thickness

Table 7. Unifacial tools.

Lot	Provenience	L	W	T	Type	Comments
33	TU 4, L5, 98.9-98.8	68.8	48.6	21.5	Oval end and side scraper	estimated 30 percent corticate
73-12	1997, surface	59.3	43.4	12.9	Oval scraper	Gray chert

Measurements in mm; L=length; W=width; T=thickness

Specimen Lot 33 is flaked on the dorsal face; a group of five ventral flakes were driven off in use. On the dorsal face opposite this group of flakes lies a zone of heavy crushing and step-fracturing. This zone measures 27.2 mm around the edge of the tool. Along another edge is a 44.5 mm length of light edge wear and step fracturing; the piece was point-plotted in the excavation unit. Lot 73-12 is a piece finished for the purpose of scraping. The tool has prepared high edge-angle edges around 95 percent of its perimeter. The edge angles vary between 49º and 75º.

Choppers

Choppers are a functional category representative of expedient manufacture and use. Frequently, only the evidence of crushing, battering, or other signs of use on them identify them as choppers. Five specimens share only chert as their material and varying degrees of cortication and use-wear (Table 8).

Specimen Lot 28-A has shelving and crushing on the pinnacles of the bifacial edge. Shelving is a form of step fracturing that occurs at the distal end of flake scars. Shelving appears as a series of vertically stacked steps that resemble minute shelves, and they may be the result of multiple, repeated impacts on the edge. This specimen and Lot 28-B were both point-plotted in the same unit and level. Lot 72-4 has use wear on the entire length (72.2 mm) of the bifacially prepared edge. The perimeter edge opposite the prepared edge is thick and corticate, suited for hand gripping of the chopper. Lot 73-5 has use-wear on the ventral face only, but it is distributed intermittently along the entire decorticate edge. Specimen Lot 77 has a clear sinuous edge from the bifacial percussion flaking preparation of the edge. Step fracturing along the edge extends well back from it, possibly indicating strong chopping blows.

Table 8. Choppers.

Lot	Provenience	L	W	T	Lithology	Cortication	Edge-wear
28-A	TU 2, L3, 9 99.1-99.0	83.4	70.0	46.3	Chert	50 percent	Shelving and crushing
28-B	TU 2, L3, 99.1-99.0	91.5	76.4	55.8	Chert	40-50 percent	Crushing and shelving
72-4	1996, surface	95	86.3	42.5	Yellow-brown chert	80 percent	Entire length of bifacial edge
73-5	1997, surface	141.4	61.2	29.3	Gray chert	50 percent	Ventral face only
77	BHT 2, ca. 60 cm bs	69.3	47.7	35.2	Banded yellow white, gray chert	50 percent	Stepping, well back from edge

Measurements in mm; L=length; W=width; T=thickness

Edge-Modified Flakes

The category of edge-modified flakes, otherwise termed utilized flakes, is a descriptive nomenclature for a class of stone tools that is implicitly expedient in nature. The terms altogether imply stone tools that were not manufactured for a specific purpose, but rather were used as needed for a cutting, slicing, or scraping purpose. Most of these artifacts are items of lithic debitage, the flaking debris left during the manufacture of an entirely different tool (Table 9).

Specimen Lot 70 has use-wear in three distinct zones along the edge. In Zone 1 they reach 3.5 mm inward from the edge; in Zone 2 they reach 4 mm; and in Zone 3 they reach 7 mm. In zones 2 and 3 the step fractures hinge into cortex material inward from the edge, but in Zone 1 the flake scars feather out into decorticate material and are less pronounced. Specimen Lot 72-2 is a tertiary flake, and has a hinge fracture halfway down the flake length. The use wear zones are along the entire lengths of both lateral edges. The marking is micro-flaking, all of it restricted to the ventral face. As noted in Table 9, Lot 73-13 has a concave working edge, giving the overall tool a shape sometimes referred to as a "spokeshave." Lot 76 has one use-worn edge, and all the use marks are on the ventral face. The dimensions and the triangular cross-section of this piece define it clearly as a fine bladelet.

Hammerstone

A single quartzite hammerstone was found in TU 6 (Table 10). The material is dense and white with pink splotches across it. Battering from the hammering function of the artifact shows distinctly on both ends. The use-wear on each end is offset slightly from the longitudinal axis, giving the artifact a beveled appearance when viewed in longitudinal cross-section.

Cores

Cores are the stone resources from which useful stone tools are fashioned. Flake scars of flakes removed for tool manufacturing or simply for material testing distinguish cores from stone not so used At the L. E. Wagner site, 11 stone cores were identified and collected (Table 11). The materials are various colors of chert, and the specimens fall into a range of core types.

Specimen Lot 61 is a platform core with heavily patinated flake scars, as was the debitage in the excavation unit. Specimen Lot 72-3 has one long concave edge with pronounced wear, including step fracturing, micro-flaking, and crushing. The wear is bifacial and the length of the wear zone is 65.2 mm. Functionally, the artifact appears to be a core that was nearly exhausted as a raw material source and was used instead for cutting, scraping, and battering functions. The edge angles vary between about 62º and 89º, which provide very heavy edges for rough work.

Lithic Debitage

The excavation units and surface collections recovered varying amounts of lithic debitage, or waste flakes from stone tool manufacture (Table 12). The lithic debitage is all on chert raw materials. Five-hundred fifty-six pieces of lithic debitage were recovered. Of these, 66 items, or 11.9 percent of the total, have evidence of burning.

Table 9. Edge-modified flakes.

Lot	Provenience	L	W	T	Lithology	% edge work	L of edge(s)	Comments
34	TU 2, L2, 99.2-99.1	47.2	35.1	14.8	Yellow-brown chert	15%	13.4	Item is 75 percent corticate
52	TU 1,L3, 99.1-99.0	20.9	35.5	6.1	Yellow-brown chert	15%	9	Very fine flake scars
59	TU 1, L4 99-98.9	23.4	27.9	5.2	Gray chert	20%	15	Fragment-medial hinge
70	1998, surface	87.1	76.9	33.3	Gray chert	10%	1-21.7 2-23.4 3-17.3	Edge-wear on three zones
72-2	1996, surface	32.9	27.8	4.8	Brown chert	60%	1-27.1 2-29.1	Tertiary flake
73-13	1997, surface	29.5	47.7	7.5	Brown chert	20%	18.6	Concave worked edge
73-16	1997 surface	21.2	12.5	5.6	Brown chert	40%	20.0	Micro-flake scars
73-15	1997 surface	49.5	32.9	7.2	Root-beer brown	85%	18.0	15% cortex, multiple use-wear
76	BHT 3, 120-140 cm bs	30	6.5	2.6	Root-beer brown chert	40%	27.5	Triangular cross-section

Measurements in mm; L=length; W=width; T=thickness
*incomplete

Table 10. Hammerstone.

Lot	Provenience	Lithology	L	W	T
56-5	TU6, L4, 99 – 98.9	Quartzite	69.8	48.8	24.9

Measurements in mm; L=length; W=width; T=thickness

In tabulating the debitage data, a stage classification was used: primary (fully dorsally corticated), secondary (partially corticated), tertiary (non-dorsally corticated), and fragments. A total of 8.8 percent of the lithic debitage are primary flakes, 23.2 percent are secondary flakes, 29.8 percent are tertiary flakes, and 39.7 percent are flake fragments. These proportions are consistent with the complete finishing of stone tools by bifacial reduction. In this technique, tertiary flakes are significantly more numerous and smaller in size per tool produced. The very high proportion of fragments also suggests that the lithic raw material may have been relatively poor and also that there may have been significant human traffic in and through the site post-depositionally, resulting in higher rates of breakage.

Fire-Cracked Rock

Fire-cracked rock is a cultural material by virtue of its marking and surface modification through human fire-making. The site had a low and variable distribution of fire-cracked rock and lacked any apparent higher density areas, apart from Feature 3, that would have been indicative of the zones of fire-building or localized discard. The recovered material was weighed (11.1 kg) and discarded (Table 13).

Table 11. Cores.

Lot	Provenience	L	W	T	Lithology	Type	comments
28	TU 2, L3, 99.1 - 99	70.06	53.1	34.1	Chert	Split cobble	No further flaking after slitting
31	TU 3, L4, 98.9- 98.8	47.6	45.4	23.4	Chert	Bi-directional	
54	TU 7, L3, 99.1 – 99	49.8	35.0	23.4	Yellow-brown chert	Bi-directional	5 percent cortex
59	TU 4, L1, 99- 98.9	93.5	79.2	48.7	Yellow-brown chert	Bi-directional	20 percent cortex
61	TU 9, L2	50	47	29.2	Brown chert	Platform	Patinated flake scars
72-3	1996, surface	75.1	36.4	30.1	Yellow chert	Multi-directional	Keeled
73-6	1997, surface	56.4	46.1	40.0	Gray chert	Platform	Possibly exhausted
73-7	1997, surface	56.2	39.4	27.6	Gray chert	Bi-directional	exhausted
75	TU 3, 120 cm bs	84.7	60.0	52.4	Yellow mottled chert	Bi-directional	No use-wear
76	TU 3, 120- 140 cm bs	43.7	78.6	48.6	Yellow chert	Tested core	One flake removal
77	TU 2, 60 cm bs	61.7	44	28.4	Gray chert	Bi-directional	5 percent cortex, exhausted

Table 12. Lithic debitage.

Lot	Provenience	Primary	Secondary	Tertiary	Fragment	N
1	TU 1, L2, 99.2 –99.1	3	1	2	2	8
2	TU 1, L2, 99.2- 99.1	1	2		1	4
3	TU 3, L1, 99.20	1		1	3	5
4	Unknown			1	2	3
5	TU 4, L2, 99.19- 99.14			1		1
6	Unknown			1		1
7	TU 7, L2, 99.2- 99.1		2	2	3	7
8	BHT N?, general recovery	6	7	10	3	26
10	Unknown				1	1
11	Unknown			1		1
12	Unknown	1				1
13	Unknown				1	1
14	Unknown				1	1
15	Unknown				1	1
16	Unknown				1	1
17	Unknown			1		1
18	TU 2, L1, 99.2	1	2	1	3	7
19	TU 1, L1, 99.2			2	4	6
21	TU 6, L1, 99.20		1			1
22	TU 8, L1, 99.2	1			5	6

Table 12. (*Continued*)

Lot	Provenience	Primary	Secondary	Tertiary	Fragment	N
23	Unknown		2		1	3
24	TU 3, L2, 99.2- 99.1				1	1
25	Unknown				3	3
26	TU 4, L2, 99.16- 99.13		1			1
27	TU 2, L3, 99.1- 99	4	3	12	7	26
28-A	TU 2, L3, 99.1 pp1		1			1
28-B	TU 2, L3, 99.1, pp2		1			1
28-C	TU 2, L3, 99.1, pp3		1			1
29	TU 2, L4, 99- 98.9	2	4	6	3	15
30	TU 2, L4, 99- 98.9		1			1
31	TU 2, L5, 98.9- 98.8	2	5	5	3	15
32	TU 2, L5, 98.9- 98.8	1	5	4	3	13
33-A	TU 4, L5, 98.9- 98.8 pp2			1		1
33-B	TU 4, L5, 98.9- 98.8 pp1				1	1
34	TU 2, L2, 99.2- 99.1	2	2		2	6
35	TU 2, L2, 99.2- 99.1	2		4	5	11
36-A	TU 2, L2, 99.2- 99.1 pp1		1			1
36-B	TU 2, L2, 99.2- 99.1 pp2		1			1
36-C	TU 2, L2, 99.2- 99.1 pp4		1			1
36-D	TU 2, L2, 99.2- 99.1 pp5			1		1
36-E	TU 2, L2, 99.2- 99.1 pp6			1		1
36-F	TU 2, L2, 99.2- 99.1 pp7		1			1
36-G	TU 2, L2, 99.2- 99.1 pp8		1			1
38	TU 8, L2, 99.2- 99.1				6	6
39	TU 8, L2, 99.2- 99.1				2	2
40	TU 6, L2, 99.2-99.1		2	9	4	15
41-A	TU 6, L2, 99.2-99.1, pp1		1			1
41-B	TU 6, L2, 99.2-99.1, pp2		1			1
42	TU 4, L4, 99.2- 99.1	2	7	11	15	35
43-A	TU 4, L4, 99-98.90 pp1		1			1
43-B	TU 4, L4, 99-98.90 pp2				1	1
43-C	TU 4, L4, 99-98.90 pp3		1	1		2
43-D	TU 4, L4, 99-98.90 pp4		1			1
44	TU 3, L4, 99- 98.9	2	4	2	8	16
45	TU 3, L3, 99.1- 99		2	4	8	14
46	TU 3, L3, 99.1- 99 pp1			1		1
47	TU 4, L3, 99.1- 99	1	2	4	6	13
50	TU 9, L1, 100.702- 100.6		3	6	3	12
51-A	TU 9, L1, 100.702- 100.6 pp2	1				1
51-B	TU 9, L1, 100.702- 100.6 pp3		1			1
52	TU 1, L3, 99.1- 99		2		1	3
53	TU 6, L3, 99.1- 99		2	5	5	12
54	TU 7, L3, 99.1-99	1	2	4	4	11
57	TU 6, L4, 99- 98.9		5	5	8	18
58	TU 7, L4, 99- 98.9	1	5	7	2	15
59	TU 1, L4, 99-98.9 pp2			1		1
60	TU 1, L4, 99- 98.9		2	7		9

Table 12. (*Continued*)

Lot	Provenience	Primary	Secondary	Tertiary	Fragment	N
61	TU 9, L2	7	8	14	39	68
62-A	TU 9, L2, pp2		1			1
62-B	TU 9, L2, pp3		1			1
62-C	TU 9, L2, pp4			1		1
62-D	TU 9, L2, pp5		1			1
64	TU 10, overburden to L2	5	11	20	44	80
75	BHT 3, ca. 120 cm bs	1	3		2	6
77	BHT 2, ca. 60 cm bs	1	5	7	3	16
Totals		49	120	166	221	556

Pp=point-plotted

Table 13. Fire-Cracked rock.

Lot	Provenience	Weight (in grams)
1	TU 1, L2, 99.2- 99.1	65
3	TU 3, L1, bottom, 99.2	25.2
6	Unknown	17.3
8	General recovery in BHT trenching	91.4
18	TU 2, L1, 99.2	36.4
25	Unknown	8.1
27	TU 2, L3, 99.1-99	9.6
29	TU 2, L4, 99- 98.9	42.7
31	TU 3, L5, 98.9- 98.8	12.9
32	TU 4, L5, 98.9- 98.8	3.2
34	TU 2, L2, 99.2- 99.1	53.6
35	TU 2, L2, 99.2- 99.1	46.8
38	TU 8, L2, 99.2- 99.1	85.7
40	TU 6, L2, 99.2- 99.1	10.5
42	TU 4, L4, 99.2- 99.1	79.4
44	TU 3, L4, 99- 98.9	64.3
45	TU 3, L3, 99.1- 99	41.6
47	TU 4, L3, 99.1- 99	100.4
50	TP 9, L1, 100.702- 100.60	53
52	TU 1, L3, 99.1-99	6
53	TU 6, L3, 99.1- 99	28
54	TU 7, L3, 99.1- 99	15.6
57	TU 6, L4, 99- 98.9	10.4
58	TU 7, L4, 99- 98.9	40.1
60	TU 1, L4, 99- 98.9	5.8
61	TU 9, L2	70.8
64	TU 10, overburden to L2	72.1
75	BHT 3, ca. 120 cm bs	14.1
	Total	11.1 kg

Other Culturally Modified Materials

The other culturally modified materials of the site are molluscan shells, charcoal samples, and hematite fragments. Molluscs on the site, marine, freshwater or terrestrial, are presumed to have been food items of the past occupants. None of the shell items showed working for ornamentation or jewelry. The charcoal samples are of material that came from the fill of Feature 3. The same is true of the hematite pieces, which may have been formerly a single fragment lost from a larger piece and recovered from the fill of Feature 3.

Mollusca

The mollusk shells are reported as to genus or species (Table 14), if known, and described as to anatomical part and the general ecological setting.

Charcoal samples

Five separate charcoal pieces were recovered from Feature 3 in TU 9, Level 2 (Table 15). The charcoal pieces probably all originated as fuel for the hearth. The charcoal specimens were further studied for potential identification to plant species. J. Kevin

Table 14. Mollusca.

Lot	Provenience	Species	Description
27	TU 2, L3, 99.1- 99	Unknown	2 bivalve umbos
29	TU 2, L4, 99- 98.9	Unknown	27 bivalve umbos, freshwater
29	TU 2, L4, 99- 98.9	Immature *Rabdotus sp*.	2 whole specimens, very small, terrestrial
31	TU 2, L5, 98.9- 98.8	Unknown	4 umbos, freshwater
32	TU 4, L5, 98.9- 98.8	Unknown	9 umbos, bivalve, freshwater
34	TU 2, L2, 99.2- 99.1	Unknown	2 umbos, bivalve, freshwater
42	TU 4, L4, 99.2- 99.1	Immature *Rabdotus sp.?* and unknown	2 small whole specimens, *Rabdotus sp*., 7 umbos, bivalve, freshwater
44	TU 3, L4, 99-98.9	Unknown bivalve	1 umbo, freshwater
45	TU 3, L3, 99.1- 99	Unknown bivalve	1 umbo, freshwater
47	TU 4, L3, 99.1- 99	Immature *Rabdotus sp.?*	2 small whole specimens
51	TU 9, L1, 100.702- 100.60	*Rabdotus sp.;* possible *Rabdotus sp*.	9 mature *Rabdotus sp*. shells; 4 possible immature *Rabdotus sp.,* terrestrial
52	TU 1, L3, 99.1- 99	Unknown bivalve	2 umbos, freshwater mussel
54	TU 7, L4, 99.1- 99	Unknown bivalve	1 umbo, freshwater
57	TU 6, L4, 99- 98.9	Unknown bivalve	10 umbos, freshwater
58	TU 7, L4,99- 98.9	Unknown bivalve	4 umbos, freshwater
60	TU 1, L4, 99- 98.9	Unknown bivalve	1 umbo, freshwater
61	TU 9, L2	*Rabdotus sp*.	21 mature, 1 immature, terrestrial
64	TU 10, overburden to L2	*Rabdotus sp*.; unknown gastropod	34 mature, 3 immature; coiling in one plane, *Helicina*; both terrestrial
73-17	1997, surface	Unknown marine bivalve	White partial valve fragment; marine
75	BHT 3, ca 120 cm bs	Unknown bivalve	1 umbo, freshwater
76	BHT 3, 120-140 cm bs	Unknown bivalve	1 umbo, freshwater

Hanselka conducted the work. After the identifications, the author removed a carbonized portion of a stick from one identified species (*Condalia sp.)* for AMS radiocarbon dating by DirectAMS and designated it TAS-DGR-2014-1 for that purpose (Table 16).

Apart from the cross dating of the site by its few diagnostic artifacts, the chronology of the L. E. Wagner site rested on the AMS radiocarbon dating of carbonized plant remains from Feature 3 (Table 16).

Calibration of the conventional age of the assay used the OxCal calibration program v 4.2.2 (Bronk Ramsey and Lee 2013), incorporating the IntCal13 calibration curve (Reimer et al. 2013). The 1-sigma calibrated age range is 3789-3932 B.C., and the 2-sigma (95.4 percent probability) calibrated age range of the assay is 3772-3943 B.C. The calibration clearly indicates that the site occupation dates to the latter part of the Early Archaic period.

Hematite

Six hematite samples appear to belong to a single specimen of hematite broken into fragments between 7.5-15.0 mm in length. All the pieces were red (10R 4/6), and none of the pieces show signs of planing or any other evidence of use. The material is sandy, and of low quality for use as a pigment. All the pieces together weigh slightly more than 1.2 gm. They were found in TU 10, in the overburden to Level 2. This is fill associated with Feature 3.

Identification of Macrobotanical Specimens from the L. E. Wagner site (41VT128), Victoria County, Texas

J. Kevin Hanselka

David Robinson submitted for identification multiple macro-botanical specimens recovered from the L. E. Wagner site in Victoria County, Texas. The 1998 TAS field school recovered the specimens in their excavations. The site is an Early Archaic period camp on the Coastal Plain in the Coastal Bend region, about 10.3 km west-northwest of the City of Victoria. Specifically it is situated on a terrace landform overlooking the floodplain of the Guadalupe River, the channel of which is about 1.2 km to the north. According to McMahon et al. (1984), the location is in proximity to three distinct vegetation zones: Pecan-Elm Forest on the margins of the Guadalupe River; Bluestem Grassland adjacent to the river floodplain; and a Post Oak Woods, Forest, and Grassland mosaic to the west. While the primary goal of this analysis was to identify to the taxon level carbonized specimens to be submitted for radiocarbon dating, the recovery and identification of botanical materials from archeological contexts can provide valuable insights into plant-related subsistence, fuel wood preference, and the nature and character of habitats exploited by the site's inhabitants.

Table 15. Charcoal samples.

Lot	Provenience	Weight (in grams)	Notes
63 #1	TU 9, L2	12.2	
63 #2	TU 9, L2	6.6	
63 #3	TU 9, L2	21	
63 #4	TU 9, L2	11.9	
69	TU 9, L2, Feature 3	522.9	Sampled for AMS dating, TAS-DGR-2014-1

Table 16. Report of AMS analysis of plant carbon from Feature 3 at 41VT128.

Direct AMS code	Submitter ID	δ (^{13}C)	Fraction of modern		Radiocarbon age	
		Per mil	pMC	1σ error	B.P.	1σ error
DAMS006419	TAS-DGR-2014-1	-19.4	53.42	0.16	5037	24

Recovery and Analysis

All specimens submitted for analysis were recovered either from the screens or in situ in the excavation units, rather than by water separation (flotation) of excavated sediments. The materials submitted originated in TU 9, Level (Lv.) 2: Lot 63, Bag 39 and Lot 69, Bag 43. The Lot 63 specimens were received as separate samples in four vials. The Lot 69 specimens were received in a single vial, and are associated with Feature 3 (see Table 15).

Analysis of the submitted materials involved several steps. The first was an initial scan of the remains to separate general wood charcoal (specifically burned wood) from other potential items (e.g., seeds, fruits, twigs, grass). Preference for radiocarbon dating would be given to "ideal" materials such as the remains of annual plants, seeds, twigs, or anything else obviously short-lived, in order to avoid issues related to the "old wood" problem and provide more secure dates (for a thorough discussion of the old wood problem, see Schiffer [1986]). Unfortunately, no such items were identified, and all fragments in the samples were recognized as either wood charcoal or dark sediment nodules clinging to or encasing fragmentary charcoal residues.

Because of the relative abundance of wood charcoal among archeobotanical assemblages, for the sake of economy, it is standard practice to thoroughly examine and identify only a sub-sample of all of the submitted specimens (Adams 2004). The standard sub-sample for identification is 20 fragments; if less than 20 are present, identification is attempted for all of them, but if more than 20 are present a sub-sample is selected. Twenty fragments were selected from each sample, beginning with the largest fragments. This sub-sample is selected in this manner because it was likely the larger specimens that caught the excavators' attention in the first place; and (perhaps most importantly) the smaller the fragment, the more difficult and less secure the identification (Minnis 1987:122; Smart and Hoffman 1988:178-79). That being noted, once the sub-sample of 20 was analyzed the additional (non-sub-sampled) specimens were scanned to be certain that clearly distinct taxa were not missed.

Each piece of wood charcoal is snapped in half so that a fresh transverse (cross) section is exposed (Adams 2004). The anatomical characteristics (rings, vessels, rays, and background patterning) exposed in this fresh break were then examined using an Omano OM99/V3 6.5x-45x stereo zoom microscope. Differences in these traits make taxonomic distinctions possible. The analyst made the taxonomic identifications in part by using a reference collection of present-day comparative plant materials consisting of common South Texas trees and shrubs, experimentally charred and maintained by the analyst.

Results

All carbonized vegetal materials observed among the samples were classified as wood charcoal; no non-woody plant parts (e.g., seeds, fruits) or remains of non-woody plants (e.g., herbaceous perennials or grasses) were observed. Further, several samples contained small to large nodules of dark gray bonded sediment; some of these did have fragments of charcoal embedded in them, but this charcoal was for the most part too delicate and highly fragmented to permit extraction and identification. Finally, the samples also contained a fine residue of sediment flaked from the sediment nodules while in storage, and tiny flecks of charcoal flaked from the larger charcoal fragments. Analysis of the more substantial fragments in the samples proceeded in the manner described above, and the results of this analysis are presented in Table 17.

As stated above, the Lot 63 (Bag 39, TU 9, Lv. 2) specimens were received as four separate samples (1-4). Samples 1 and 2 only contained sediment nodules and flecks/fragments of charcoal too degraded to permit identification. In contrast, Sample 3 contained a substantial amount of charcoal (n=110 pieces). Of a sub-sample of 20 fragments, six were too degraded to permit identification, but the cross-section anatomy of the remaining 14 compares favorably with that of *Condalia sp*. (Rhamnaceae). Out of only five wood charcoal specimens present in Sample 4, four were unidentifiable, and one compares favorably (cf.) with *Condalia sp*. Finally, the single sample associated with Feature 3 (Lot 69, Bag 43, TU 9, Lv. 2) contained 86 wood charcoal fragments; all 20 fragments in the selected sub-sample also compare favorably to *Condalia sp*. (Figure 18).

Discussion and Conclusion

The only taxon identified among the analyzed wood charcoal fragments in samples from Lots 63 and 69 was cf. *Condalia sp*. (Rhamnaceae) (n=35). There

Table 17. Wood remains from Lots 63 and 69 at the L. E. Wagner site.

Lot	Sample wt (g)	Sample	Wood	Count	Wt (g)	Soil nodules wt (g)/residue
63	1	5.6	flakes (no ID)	NA	NA	5.6
	2	0.2	flakes (no ID)	NA	NA	0.2
	3	14.6	Total wood:	110	2.73	11.3
			non-sub-sampled (no ID)	90	1.5	
			sub-sample (of 20):			
			unidentifiable	6	0.3	
			cf. *Condalia* sp.	14	1.2	
	4	5.4	Total wood:	5	<0.0	5.4
			unidentifiable	4	<0.0	
			cf. *Condalia* sp.	1	<0.0	
69	NA	15.9	Total wood:	86	2.3	13.7
			non-sub-sampled (no ID)	66	1.0	
			s ub-sample (of 20):			
			cf. *Condalia* sp.	20	1.3	
Totals		41.7		201	5.03	36.2

ID-identified

are 18 species of this genus in warm temperate and tropical arid America, five of which occur in Texas (Correll and Johnston 1970:1013-1014). Of these, the species presently attributed to Victoria County is *Condalia hookeri* (brasil, Brazilian bluewood) (USDA n.d.); although species distributions have likely changed over time, brasil is a likely candidate for the specimens found on the L. E. Wagner site.

Brasil is a spiny shrub or tree up to 9 m tall found in the Trans-Pecos, the southern Edwards Plateau, Rio Grande Plains, and Coastal Prairie of Texas (Everitt and Draw 1993:141). It is a major component of South Texas brush lands and is commonly encountered in various mixed brush habitats with drier soils, where it has a tendency to form thickets (Everitt and Drawe 1993:141). The sweet, succulent purple-to-black fruits ripen throughout the summer; these fruits are edible and can be made into jelly and wine (Everitt and Drawe 1993:141; Taylor et al. 1997:27). The Maricopa and Pima are documented to have eaten brasil fruits both raw and roasted (Hrdlicka 1908:262-265). The wood has been used for fuel (Taylor et al. 1997:27), so it is not surprising to find wood charcoal of this taxon in this archeological context. The multiple specimens found in the analyzed samples likely represent the remains of a single piece of wood that became highly fragmented upon being reduced to charcoal, but this is uncertain. Further, many or all of the numerous charcoal fragments in the samples that were not identified in this analysis may also represent brasil wood, although other taxa may be present as well.

Summary and Synthesis

The L. E. Wagner site (41VT128) is a small and probably serially occupied campsite dating to the Early Archaic period. The site most likely was formed during the same time as the pedological growth of the Soil Zone II paleosol. The later sandier deposits of Unit 1 sediments did not contain artifacts. The surface finds eroding out along the road came from a context where Soil Zone II outcrops at the surface. This area is near the southern edge of the site where the higher alluvial terrace rises above the topographically lower floodplain deposits.

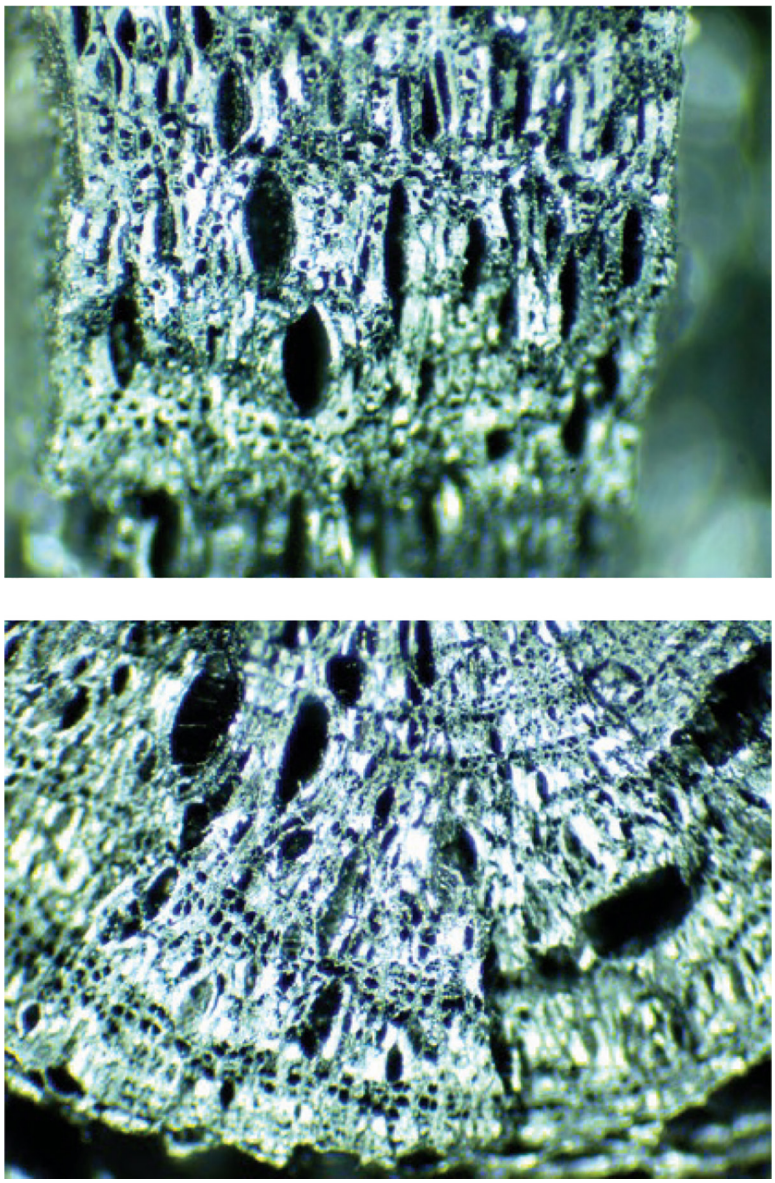

Figure 18. Comparison between cross-sections of an archeological wood charcoal specimen (top) from the L. E. Wagner site (Lot 63, Bag 39), and a modern, experimentally charred *Condalia* sp. specimen (bottom). Both photos taken at 40X.

Chipped stone tools dominate the artifact assemblage, with diagnostic types such as Clear Fork tools, Guadalupe tools, and one Williams dart point. Additional stone tools are bifacial and unifacial forms, including multi-directional and bi-directional cores, rough choppers, unifacial scrapers, and unfinished bifaces for dart point manufacture. Stone flaking debris was also found; analysis of the debitage suggested that all stages of bifacial reduction of chert raw materials for tool manufacture occurred at the site, with an emphasis on final thinning and finishing. Clearly, the site was a camp for stone acquisition and also tool manufacturing to produce the finished end products. As well, expedient-use edge-worked flake tools are numerous; these, along with formal tools, suggest that a range of maintenance, repair, and craft working functions took place at the L. E. Wagner site.

Fire-cracked rock is relatively common in the site's archeological deposits, as it formed Feature 3 and was scattered elsewhere in low densities. Likely food remains included a variety of snail species and freshwater bivalves. One unidentified piece of marine shell was found on the surface; it may have been a portion of an oyster shell. The bones of vertebrates were not found in the excavations or on the surface. Six small, fragmented, pieces of hematite were found in the Feature 3 fill, and charcoal was found in association with Feature 3 but not in the other units of the excavations or near Feature 1. The charcoal specimens were identified as brasil or brasilwood, a common brush land species in the region that would have been used for food and fuel.

The most important fact of artifact patterning in the site is the restriction of cultural artifacts to Soil Zone II, the paleosol dated by AMS to earlier than 5700 years B.P. The surface artifacts were found eroding out of Soil Zone II where it rises to the surface near the southern edge of the floodplain. The temporal association of the artifacts is in the Early Archaic period, especially with the occurrence of Clear Fork tools and a single Guadalupe tool in the archeological deposits. The Williams point found in

TU 9, Level 1, above Feature 3, has a relatively broad chronological range as currently known, including the Early Archaic (Turner and Hester 1999:194-195).

Lithic debitage and fire-cracked rock are material classes commonly used to identify spatial patterning of site features and activity areas because they are usually spread throughout a site and often serve to delimit the total site area. At the L. E. Wagner site, however, lithic debitage and fire-cracked rock were scattered in extremely low densities. This situation makes it problematic for identifying activity patterns based on variable densities of these debris categories. Fire-cracked rock was distributed in variable densities throughout the excavations, but not in significantly higher densities in and near the constructed hearth (Feature 3). The vertical distributions of lithic debitage and fire-cracked rock suggests a lens of cultural activity and concentration within Soil Zone II.

Feature 3 is interpreted as a warming or cooking hearth that may be typical of rock features found in Early Archaic period sites. Feature 3 appeared partially disturbed, as though rocks and ash had been cleared away from cooked food items. The Richard Beene site (41BX831) on the Medina River (Thoms and Clabaugh 2011) south of San Antonio and the Berdoll site on Onion Creek in the Colorado River drainage (Karbula et al. 2011) had diverse cultural residues and significant numbers of features. At the Richard Beene site, the lower Medina component dated to the late Early Archaic period. It contained relatively higher densities of lithic debitage, mussel shell, and bone, notably deer bone, compared to the L. E. Wagner site, which had low densities of all artifact classes and a complete lack of bone. The lower Medina component had seven types of constructed features among 24 features, including: small basin pits without rocks, small basin pits with fire-cracked rock, a large oven-like feature with a rock heating element (piled rocks), fire-cracked rock concentrations of unknown function, mussel shell concentrations, a large sheet midden, and small, oxidized areas (possible ground surface hearths without rocks) (Thoms and Clabaugh 2011:88-91). Feature 1 at the L. E. Wagner site is most likely not a hearth feature, but instead is a cluster of artifacts and washed-in materials. Feature 3, while a small hearth, does not seem to correspond to any of these feature types in structure and dimensions. The lower Medina Component at the Richard Beene site also yielded lithic debitage and stone tool features indicative of finished tool manufacturing and reconditioning (Thoms and Clabaugh 2011:90).

Although farther afield, the Berdoll site (41TV2125) in Travis County had a discrete Early Archaic period component (Karbula et al. 2011). Archeologists excavated 12 long backhoe trenches through the site, and they expanded five areas within it to form larger excavation blocks. This amounted to much more excavation than at the L. E. Wagner site, but the general result was similar: a low density of cultural materials (Karbula et al. 2011:136, 140). Material classes recovered were lithic debitage, cores, bifaces, edge modified flakes, ground and pecked stone, mussel shell, snail shell, red ochre, and fire-cracked rock (Karbula et al. 2011:142 and Table 1). All these material classes save ground and pecked stone were recovered at the L. E. Wagner site. There were 10 features at the Berdoll site, all rock concentrations of varying sizes, and all thought to be cooking features. A larger feature, Feature 11, may have been an earth oven (Karbula et al. 2011:148-151); the feature rocks of Feature 11 filled a shallow basin. None of the Berdoll site features resemble either Feature 1 or Feature 3 at the L. E. Wagner site. Karbula et al. (2011:136) interpreted the Berdoll site to be a short term repeatedly occupied campsite used by only one or two nuclear families at any given time. The cooking features and relatively larger earth oven likely indicate some seasonally focused plant food processing at the site, such as acorns, bulbs, or edible roots of various plant species.

These site material and functional comparisons indicate the variety of Early Archaic period subsistence adaptations in the diverse resource zones of the West Gulf Coastal Plain. The diversity of burned rock features and other constructed features found on sites reflects this strongly.

Implications of the Site Setting and Geomorphology

The L. E. Wagner site is an Early Archaic period component (occupied before 5700 cal years B.P.) formed in a silty clay loam alluvial deposit on the margins of the Guadalupe River valley. The most significant fact of the site's geomorphology is Huffman's observation that Soil Zone II and its potentially associated Soil Zone III may comprise the entire

Mission Creek floodplain beneath its current sandy loam soils as well as the extensive Guadalupe River floodplain out to its current right bank channel. Huffman further observed that the time of accumulation of two soil units may have spanned the entire Holocene. The excavations suggest that the entire extent of the paleosol may potentially be culture-bearing, with low density components scattered through it.

Comparisons with regional geomorphic developments assist in the understanding of Early Archaic populations and paleoenvironmental conditions. Excavations at the Richard Beene site (41BX831) revealed a long geomorphic sequence in the Medina River valley (Mandel and Caran 1992; Thoms 2007; Thoms and Clabaugh 2011). The Medina River is a tributary of the San Antonio River, which in turn flows into the Guadalupe River downstream from Victoria. Soil Zone II at the L. E. Wagner site dates the paleosol slightly earlier than the Medina Paleosol (within the Medina Pedocomplex). The texture and structure of the Medina Paleosol has weak, medium, prismatic peds that transition to moderate, medium, sub-angular blocky peds throughout its sub-horizons. These structures contrast with the weakly developed sandy deposits above and below it in the sequence (Mandel and Caran 1992; Thoms and Mandel 2007:50-52). The soil there also contrasts with the L. E. Wagner Soil Zone II, which has very hard and strong columnar peds well-developed within its silty clay loam. Both the Medina Paleosol and Soil Zone II at the L. E. Wagner site likely had sufficient time to develop mature horizons.

Fox (1979:62-68) reported on soil zones A-C that extended continuously across sites in the Sulphur Creek valley; Sulphur Creek is a minor tributary of Coleto Creek, itself a tributary of the Guadalupe River downstream from Mission Creek. Geologist Glen Evans studied the soil profiles, and he suggested that the lower slopes along the stream had been wooded since the Pleistocene. This is a finding supportive of the settlement-subsistence model of residence near more abundant stream valley resources. Phytolith and soil data suggested a xeric period in the earliest Archaic deposits at the lower horizon boundary of Zone B with Zone C. Warmer times persisted, with a mesic interval ca. 6000 B.P., until late in the Zone B accumulation, when a wetter, more mesic period began at the first part of the Late Archaic period by ca. 3000 B.P. (Fox 1979:68). It is not known if the mesic changes at 6000 B.P. brought about corresponding edaphic dynamics that promoted the maturing of more silty and clayey soil horizons.

It is possible that the mesic conditions at ca. 6000-5900 years B.P. that produced a higher and more consistent flow of Mission Creek and the Guadalupe River brought about the soil changes noted in L. E. Wagner site excavations. These would be the changes that may have given rise to the development of the Soil Zone II paleosol.

The Early Archaic was a time of sea-level changes, coastal movements, and changes in the availability of aquatic and marine resources. These changes were a response to worldwide forces and have meaning for any reconstruction of ancient times. At the time of the occupation of the L. E. Wagner site, about 5700-5900 years B.P. and earlier, the Texas Gulf coast was in the Middle Holocene Highstand, a time of heightened, largely stable, sea level from about 6000 to 4000 B.P. (Ricklis 2004:164). The period saw the increase in number of sites in the coastal zone. The higher sea level, however, did not bring the coastline substantially closer to the site.

Conclusions

The L. E. Wagner site lies 63.3 km as the crow flies inland from a point on San Antonio Bay. Developments in the coastal zone may provide illuminating site-settlement contrasts with the site occupation. Specifically, Ricklis (2004:172-174) established that for Late Prehistoric coastal groups, the scale of seasonal coast/inland migratory subsistence rounds extended no farther than about 40 km from the barrier islands' Gulf beach lines. No such measure has yet been offered for Early Archaic settlement-subsistence migratory rounds, but it may be a useful benchmark for understanding and interpreting the scale of hunter-gatherer seasonal movements in the region during prehistoric times. The L. E. Wagner site lies well outside this zonal boundary from the coast and estuaries.

The geographic position of the L. E. Wagner site places it well within a zone of inland hunter-gatherer adaptations and mobility patterns. Its location contrasts with the Morhiss site, 30 km closer to the coast downriver, where coastal artifact assemblages are mixed within the thick Archaic cultural deposit (Campbell 1976:80-86). Shell artifacts were also found in the Buckeye Knoll burials (Ricklis 2011:40). The L. E. Wagner site was a component

within a settlement-subsistence pattern much more likely to have been similar to that of contemporary Coleto Creek sites, argued by Fox (1979:68-71) to have been left by small groups that relied on the varied resource zones of the tributary streams of the Guadalupe River. The finds of brasilwood in the Feature 3 hearth at the site also provide evidence of fuel wood and plant food exploitation of the brush lands outside the river/creek system. The L. E. Wagner site, on Mission Creek, offers another example of inland adaptations in the Early Archaic period. The site is an example of an Early Archaic period pattern of marked inter-site feature diversity within low intra-site material densities of artifacts and cultural remains.

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The History and the Rock Art of San Esteban Rockshelter, Presidio County, Texas

Roger D. Boren

San Esteban Rockshelter (41PS20) is situated along the historic Chihuahua Trail in Presidio County, Texas. Charles Peabody of the Peabody Museum, Harvard University, visited the rock shelter in 1909 and described some of the rock art he encountered. Forrest Kirkland and A. T. Jackson both recorded some of the rock art found in the shelter in the 1930s, as did Miriam Lowrance of Sul Ross State University in the 1960s. In 2000, the Texas Archeological Society (TAS) and the Center for Big Bend Studies (CBBS) conducted a joint field school in the immediate area of San Esteban and these investigations included recordation of the rock art. Much of the rock art at the shelter has faded away or has been destroyed. This article discusses the history of San Esteban Rockshelter and the Chihuahua Trail. It also describes the rock art as it exists today and offers suggestions regarding certain aspects of individual designs.

> *"The special merit, and the special attraction, of rock-art as the subject of archaeological enquiry is its directness. These are images from ancient worlds as ancient human minds envisioned them; these are neither stray fragments of ancient garbage nor chance stumps of perished buildings. They are all direct material expressions of human concepts, of human thought"* (Taçon and Chippindale 1998:1–2).

San Esteban Rockshelter (41PS20) is located in the Alamito Creek drainage of northeastern Presidio County, Texas. This location, approximately 16 km south of Marfa, is in the Marfa Plain, also known as the Marfa Grasslands (Figure 1).

The long axis of the shelter trends north to south for about 80 m Figure 2). The widest area within the shelter, from east to west, is approximately 15 m. From this point moving towards the south, most of the shelter floor is covered with large boulders spalled from the ceiling; however, there are areas under the existing overhang that are boulder free.

The western edge of the interior of the shelter (also the eastern edge of a *tinaja*) is lined with large, massive boulders, the largest of which is located at the southern end of the *tinaja* and measures approximately 10 x 13 m. The *tinaja* lies to the west of the shelter and measures approximately 12 m north to south and about 15 m east to west. The actual depth of the *tinaja* has not been determined.

In the north central portion of the shelter, there is a linear stacked rock wall that measures about 4 m in length and 1 m in height. This rock wall may have served in the past to pen livestock. Water seeps down the back wall in the central portion of the shelter, apparently due to the pools of rain that are caught in the cliffs above. This moisture provides for the growth of moderate plant life along the back wall. This plant growth has undoubtedly varied over time but today includes several plants that may have served as a minor food source for both humans and animals. There is a good possibility that rock art may have adorned this portion of the wall in the past but is no longer present today.

Significant supplies of water in the form of springs and *tinajas* can be found along the Alamito Creek drainage to its juncture with the Río Grande. The terrain in this area of the Trans-Pecos is extremely rough, and cross country travel can be quite difficult. Significantly, the Alamito Creek basin provides a relatively easy, well-watered passage from its mouth at the Río Grande, located east of present-day Presidio, to the Marfa Plain where further travel to the west, north, and east becomes less difficult.

Figure 1. Map of the eastern Trans-Pecos, Texas. Center for Big Bend Studies, Sul Ross State University, Alpine.

Alamito Creek is the largest tributary of the Río Grande in Presidio County. It merges with the Río Grande ca. 11 km downstream from the confluence of the Río Conchos that flows north out of Chihuahua, Mexico. The relative ease of travel along the Alamito Creek basin, along with the abundant water available near the shelter and in the creek, made this route attractive for travelers through time. Permanent water sources in the Trans-Pecos, such as the *tinajas* at and near to San Esteban Rockshelter, were visited regularly and repeatedly over many millennia as various groups

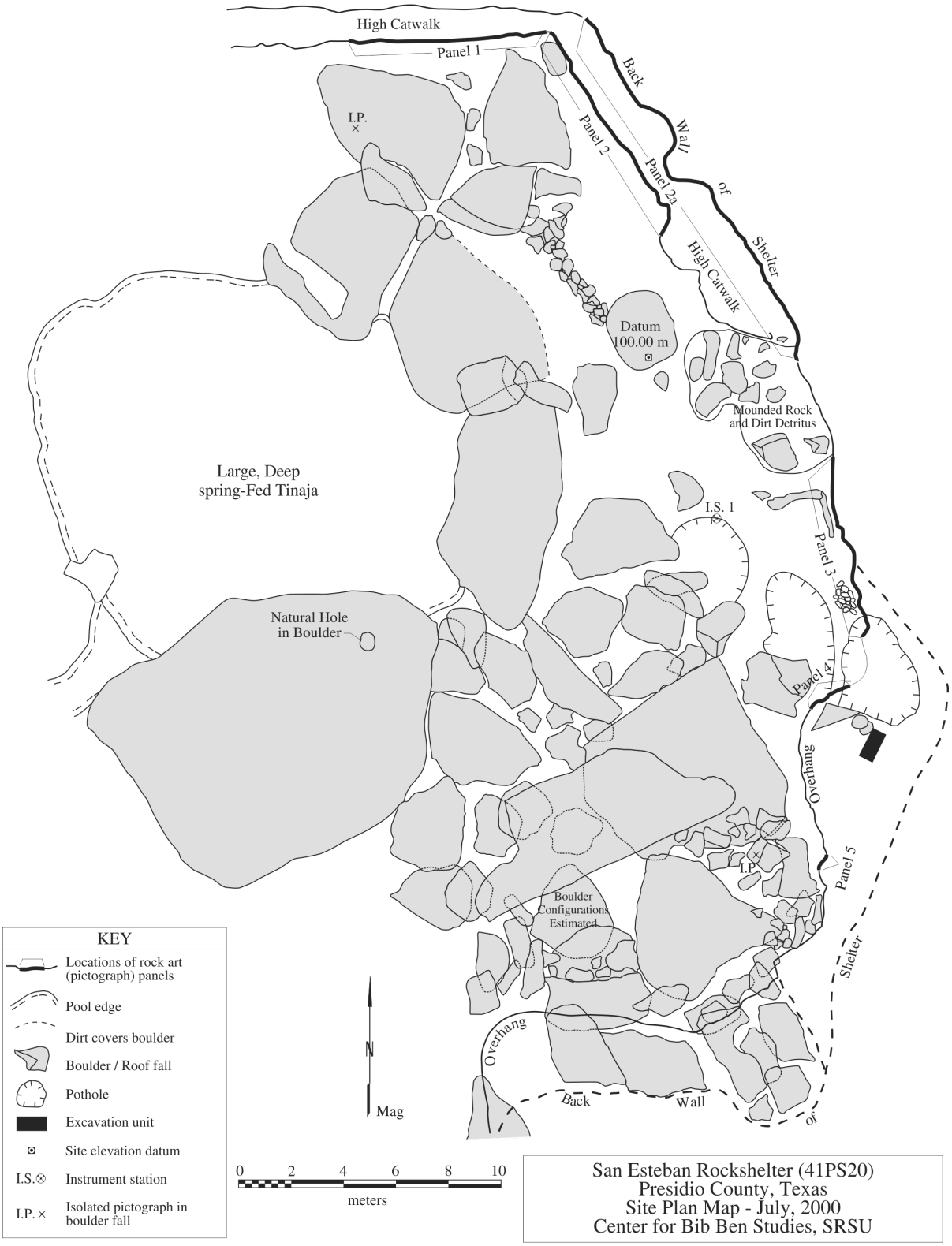

Figure 2. Plan view map of San Esteban Rockshelter. Adapted from Mallouf (2000).

traversed the area. The location of the rock shelter is on a route used extensively by prehistoric and historic native populations, early Spanish explorers (Castañeda 1976 [1936]), travelers and traders on the Chihuahua Trail (Santleben 1967 [1910]); Peabody 1909; Froebel 1859), the early ranching community (Thompson 1985), and, for a while, visitors to San Esteban (Marfa) Lake. This enduring traffic has no doubt influenced the type and variety of rock art present at the rock shelter today.

San Esteban Rockshelter occupies a critical sheltering location on the Chihuahua Trail and it has, seemingly, been recognized as such through time. Rainwater runoff flows over the rock shelter dripline, and currently falls into the *tinaja*. The local consensus today is that the *tinaja* is a perpetual water source, and it may be spring-fed from its depths. The antiquity of this deep pool of permanent water just outside the entrance to the shelter, however, has come into question. A 1920s photograph taken by Francis (Frank) King Duncan from just outside the entrance to San Esteban Rockshelter and just prior to the building of the Kansas City, Mexico and Orient Railroad line, indicates that the pool of water present at the shelter today did not exist when the photograph was taken. It is possible that a small spring was present in that location, at the time, but is not visible in the photograph.

The original Kansas City, Mexico and Orient (KC, M & O) railway, which passes within 50 m of San Esteban Rockshelter, was completed to Presidio, Texas, in 1929 by the Santa Fe Rail Company that had purchased the KC, M & O. Locomotive engines, in use at that time, were driven by steam motive power, and, therefore, required fuel to burn and lots of water. In urban areas, especially in the northern states, the rail company constructed goblet-type water towers alongside the tracks (Kerr and Donovan 1968:135, 195). When the east to west Southern Pacific Railway was constructed, access to water was a major problem. The railroad workers had to build "tank towns" every 20 or 30 miles and towns sprang up and prospered at these locations (Thompson 1985:182).

Considering this great need for water by the locomotive steam engines of the time and the proximity of the railway to San Esteban Rockshelter, perhaps railroad company employees dynamited an existing small spring to create the pool where the *tinaja* is now located. A comparison of the 1920s Frank Duncan photograph (Figure 3) to a current photograph of the rock shelter and the *tinaja*, taken by the author, lends credence to this conjecture (Figure 4). On the west side of the *tinaja* there is a concrete railway culvert that allows access to the shelter today, under the railway, from the Alamito Creek drainage. Between the culvert and the western edge of the *tinaja* there is a raised rock and earthen embankment without which a considerable amount of water from the *tinaja* would flow out of the rock shelter area through the culvert. Indeed, small amounts of the *tinaja* water constantly seep through the culvert today. The small embankment may have been built after the *tinaja* was dynamited.

Several large catchment areas or *tinajas* that collect and hold rainwater do exist in the canyon floor above the rock shelter (Figure 5). These catchment areas have probably functioned in this manner for a very long time as they provided water to inhabitants and/or visitors to the shelter.

The richly watered route along the Alamito Creek basin leading north from the Río Grande and Mexico, the proximity of the salt lakes in southeastern New Mexico and western Texas, the plentiful game along the Pecos River to the northeast, and the resources of the Davis and Guadalupe Mountains to the north have all contributed to the popularity of the San Esteban Rockshelter. Many of the visitors who have stopped over at the shelter have left their marks on its walls and numerous fallen boulders.

Environmental Setting

San Esteban Rockshelter is located within the eastern portion of the Trans-Pecos and in the northern extension of the Mexican Highlands. A basin and range topography dominates the Mexican Highlands as well as the western portion of North America. The eastern Trans-Pecos lies within the far northeastern area of the vast Chihuahuan Desert. The Chihuahuan Desert ranges from south central New Mexico to just north of Mexico City, and from the Pecos River in Texas westward to the central portion of the state of Chihuahua in Mexico (Mallouf et al. 2006:5). The Chihuahuan Desert is estimated to be between 357,000 km^2 (Schmidt 1986:41) and 505,000 km^2 (Johnston 1977:335) in size, dependent upon the criteria utilized to delineate its borders (Powell and Hilsenbeck 1995:4). Based on studies of plant fossils from ancient packrat (*Neotoma* sp.) middens, Van Devender and Spaulding (1979:701-710) determined that present-day Chihuahuan Desert vegetation and

Figure 3. 1920s era photograph of San Esteban Rock shelter by Francis K. (Frank) Duncan. Photograph courtesy of William Hubbard.

Figure 4. Present-day photograph of the *tinaja* at San Esteban Rock shelter. Photograph by the author.

climatic conditions were established after 8000 years before present (B.P.) and modern Chihuahuan Desert plant species were well entrenched by about 4500 B.P. (Van Devender 1995:86–87). Recent work conducted by the Center for Big Bend Studies (CBBS) at Early Archaic and Late Paleoindian sites in the eastern Trans-Pecos, however, suggest that Chihuahuan Desert scrub was present in the region as early as ca. 11,000 years ago (Boren 2012).

Geology. During the Middle Tertiary (47 to 18 million years ago [mya]), subduction of the Farallon tectonic plate beneath the western edge of the North American plate triggered an arc of volcanic activity along the west side of the North American continent. This volcanic arc extending from southern Mexico to Canada had a significant impact on West Texas. The Big Bend region is composed of many high mountains that are the eroded remnants of volcanoes (Henry 1998:32–54).

During the Miocene epoch, around 25 mya, the western portion of North America began to be pulled westward, and broke apart along a series of faults perpendicular to the pull. In Texas, between the Pecos River in the east and the Río Grande in the west, the pull was to the east-northeast and began the faulting that created a series of north-northwest-trending uplifted blocks and down-dropped blocks or basins. This faulting was a major factor in the creation of the topography seen today in Trans-Pecos Texas. Subsequently, the deep basins created across the Trans-Pecos collected sediment eroding from the nearby highlands (Henry 1998:55–56).

San Esteban Rockshelter is formed in the Mitchell Mesa Welded Tuff geologic formation. The Mitchell Mesa Welded Tuff is itself surrounded by the Perdiz Conglomerate formation. Mitchell Mesa Welded Tuff is considered to be a cliff-forming ash flow. This porphyritic material consists of

Figure 5. Rain catchment area in cliffs above San Esteban Rock shelter. Photograph by Robert J. Mallouf.

phenocrysts of quartz and chatoyant sanidine up to five mm in size in aphanitic pink to reddish-gray rock. It weathers to a dark reddish-gray to black. This material ranges up to 78 m in thickness with an average thickness of 14 m (Barnes 1979).

The Perdiz Conglomerate is a widespread fanglomerate. Highly variable in composition, this material is composed mainly of detritus shed primarily in a northeastward direction from the Chinati Mountains in the Cuesta del Burro area. The Perdiz Conglomerate consists of basalt, banded rhyolite, rhyolitic welded tuff, and cobbles of riebeckite rhyolite (Mallouf 1993:14) and small gravels cemented within a calcareous matrix of sand and volcanic ash (Dietrich 1966:13). Additional siliceous materials found within this conglomerate include cobbles of chert, chalcedony, and agate (Ing et al. 1996:174). These components represent excellent sources of knappable stone material for tool making. The Perdiz Conglomerate can have a thickness of up to 152 m (Dietrich 1966:13; Barnes 1979).

Climate. That portion of the Chihuahuan Desert lying within the United States generally ranges from 3500–4200 ft. above mean sea level (amsl). These elevations contribute to cool winter nights in the desert with nighttime temperatures dropping below freezing approximately 100 times per year at various locations in the region (MacMahon 1985:83; Powell and Weedin 2004:25).

Based upon data collected between 1951-1980, Larkin and Bomar (1983:48-50) report an average annual mean temperature in the area of San Esteban Rockshelter of about 62º F, while the average annual low temperature is near 67º F. and the average annual high temperature is approximately 70º F. Daytime summer temperatures often reach or exceed 100º F (Larkin and Bomar 1983:18). The area is characterized as arid to semi-arid with average annual precipitation reported at about 35-38 cm. Much of the precipitation that falls in the area accumulates between July and October during the monsoonal rainy season.

These data reflect somewhat cooler temperatures and a slightly higher rate of precipitation when compared to adjacent regions. This may be due to elevation and to the proximity of the Davis Mountains that lie a short distance to the north and includes Mount Livermore with an elevation of 8382 ft. amsl.

Flora. Typical species of Chihuahuan Desert plants abound in the area. These include creosote bush (*Larrea tridentata*), lechuguilla (*Agave lechuguilla*), tarbush *(Flourensia cernua*), ocotillo (*Fouquieria splendens*), sotol (*Dasylirion* sp.), yucca (*Yucca* sp.), acacia (*Acacia* sp.), prickly pear (*Opuntia* sp.), and honey mesquite (*Prosopis glandulosa*) (Mallouf 1993:6; Powell 1998:3).

San Esteban Rockshelter is in the Marfa Plain or Marfa Grassland. The dominant grass species in the area is blue gramma (*Bouteloua gracilis*). Other grasses noted in the area include three additional grammas (*B. ramose, B. curtipendula, and B. eriopoda*), threeawns (*Atristida* spp.), tridens (*Tridens* spp.), and fluffgrass *(Dasyochloa pulchella*) among others (Powell 1998:4–7).

As noted earlier, portions of the interior cliff walls of San Esteban Rockshelter seep with moisture and plant growth is plentiful. No doubt, many varied species of plants have grown within the rock shelter through time. Some plants noted growing on the rock walls and inside the shelter today include: golden currant (*Ribes aureum*), netleaf hackberry (*Celtis laevigata* var. *reticulata*), wolfberry (*Lycium* spp.), and maidenhair fern *(Adiantum* spp.) (Andrea Ohl, personal communication 2008). A large pecan tree (*Carya illinoinensis*), initially thought to be non-native in this area, stands just outside the rock shelter alongside the *tinaja*. Recent identification of fuel wood charcoal from a prehistoric thermal feature, dating to between 9230–8630 calibrated years B.P. at a Late Paleoindian site (41BS2615) located a short distance to the southeast, demonstrates that *Carya illinoinensis* was once, indeed, native to the region (Puseman and Cummings 2013).

The fruits of the golden currant, netleaf hackberry, and wolfberry plants, as well as pecan, could all serve as a good source of food for wildlife and humans (Tull 1987; Powell 1998; Moerman 2010). A tea made from the leaves of the maidenhair fern is reported to have medicinal properties (Yarborough and Powell 2002:5) and the stems of the fern provide strong cordage or stitching material (Tull 1987:380).

Fauna. Some of the characteristic mammalian species occurring in the desert basins of this area of the state include the American badger (*Taxidea taxus*), Mexican ground squirrel (*Citellus mexicanus*), spotted ground squirrel (*Citellus spilosoma*), yellow-faced pocket gopher (*Cratogeomys castanops*), desert pocket mouse *(Perognathus penicillatus*), several kangaroo rat species (*Dipodomys ordii, D. merriami, and D. spectabilis*), deer mouse (*Peromyscus maniculatus*), black-tailed jackrabbit

(*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), Pronghorn antelope (*Antilocapra americana*), white-tailed deer (*Odocoileus virginianus*), and mule-deer (*O. hemionus*) (Blair 1950:107). The Mountain sheep (*Ovis canadensis*), thought to have been common to the area in the past, have recently been reintroduced (Schmidly 1977:19-22). A small group of mammals common to both the basins and the mountains are the striped skunk (*Mephitis mephitis*), the hog-nosed skunk (*Conepatus mesoleucus*), Merriam's pocket mouse (*Perognathus merriami*), the southern grasshopper mouse *(Onychomys torridus*), and the western harvest mouse (*Reithrodontomys megalotis*) (Blair 1950:107-108).

The collared peccary (*Pecari tajacu),* or javelina, is quite common in Trans-Pecos, Texas today. *Pecari tajacu*, however, may be a relative newcomer to the area. Schmidly (2002:270) notes that Vernon Bailey's (1905) *Biological Survey of Texas* did not "collect or observe peccaries in the Big Bend or the Davis Mountains, places where they are common today."

Representative lizards of the desert basins include: the lesser earless lizard (*Holbrookia maculata*), the eastern fence lizard (*Sceloporus undulatus*), the Texas horned lizard (*Phrynosoma cornutum*), the roundtail horned lizard (*P. modestum*), checkered whiptail lizard (*Cnemidophorus tessellates*), and the New Mexico whiptail lizard (*C. perplexus*). A single land turtle (*Terrapene ornate)* is known for the area. This turtle, which may have been a valued nutritional resource both prehistorically and historically, is quite scarce in the area today (Blair 1950:108).

A few of the snakes that are characteristic of the desert basins are the coachwhip (*Coluber flagellum*), the gopher snake (*Pituophis catenifer*), checkered garter snake (*Thamnophis eques*), and the western diamondback rattlesnake *(Crotalus atrox*) (Blair 1950:108).

Many avian species probably served native populations as important sources of food, bone, and feathers. These species include the wild turkey (*Meleagris gallopavo*), the golden eagle (*Aquila chrysaetos)*, several hawk species (*Buteo* spp.), falcons (*Falco* spp.), Montezuma quail (*Cyrtonyx montezumae),* Scaled quail (*Callipepla squamata*), Gambel's quail (*Lophortyx gambelii*), and the Greater roadrunner (*Geococcyx californianus*) (Schmidly 2002).

Shelter from the elements, available water, and the varied plant life available at or near San Esteban Rockshelter, no doubt, served as a significant attraction to the wildlife in the area. These same factors, including the presence of wildlife, would have also attracted humans.

Area Archeological Investigations

An early archeological discovery in the region dates to 1895 when a cache of over 1500 stone arrow points were found buried within and beneath a rock cairn on the summit of Mount Livermore in the Davis Mountains (Janes 1930:8). News of this discovery may have prompted Charles Peabody with Harvard University's Peabody Museum to conduct a reconnaissance through the eastern Trans-Pecos in 1909. A segment of the reconnaissance included a trip northward up Alamito Creek and a visit to San Esteban Rockshelter (Peabody 1909:202–216). Peabody (1909:215) provided a brief description of some of the rock art that he observed at the shelter:

> They include a set of figures, human and not human, in black; an outlined Greek cross in red; a headless human figure, eight inches long; many parallel lines in red; six black marks over a small recess; a scalp-shaped figure, in black, and lines in red, a rude arrow in orange, nine horned animals pointing the same way, and some modern initials.

E. B. Sayles visited the region and San Esteban Rockshelter in the early 1930s (Sayles 1935). A. T. Jackson (1938) called San Esteban simply Site No. 31. When Forrest Kirkland (Newcomb and Kirkland 1967) recorded rock art at the site in 1939 it was known as Marfa Lake Shelter. Miriam Lowrance (1988a) re-recorded some of the rock art in 1967 and 1968, and she refers to the shelter as both San Esteban and Marfa Lake Shelter. Lowrance (1982a, 1982b, 1986, 1988a, 1988b) recorded the rock art at many sites in the eastern Trans-Pecos during her time as a Fine Arts instructor at Sul Ross State University.

James E. Corbin formally recorded San Esteban Rockshelter on State of Texas forms in 1960. The trinomial 41PS20 was assigned to the site. Corbin produced photographs and drawings of some of the rock art at the site at this time. Due apparently to a misinterpretation of E. B. Sayles' ca. 1932 field notes, three additional trinomials (41PS99, 41PS100,

and 41PS101) were also assigned to San Esteban Rockshelter. These three site numbers were later recognized as erroneous and were retired in 1999 (Jonathan H. Jarvis, personal communication 2014). San Esteban Rockshelter was designated as a State Archeological Landmark (SAL) in 2002 and a SAL marker was placed inside the shelter.

The 2000 field school conducted by the Center for Big Bend Studies (CBBS) and the Texas Archeological Society (TAS) along portions of the Alamito Creek basin included site survey and test excavations in select areas along the drainage, as well as rock art recordation and excavations within San Esteban Rockshelter. The rock shelter excavations consisted of two 1 x 1 m excavation units placed in the floor deposits. The excavation units were located within the central portion of the rock shelter adjacent to depressions (potholes) left by unauthorized persons who had been digging in the shelter. Each excavation unit revealed a well-stratified soil sequence and considerable perishable material including knotted fibers and corncobs. As would be expected, many animal bones were also present (Mallouf n.d.).

A recently discovered Early Archaic (ca. 8000–4500 B.P.) open campsite (41PS1020) has been located approximately 3.5 km southeast of San Esteban Rockshelter, on the eroded banks of Alamito Creek proper. Preliminary excavations were conducted at the site for the Trans-Pecos Archaeological Program (TAP) of the CBBS, Sul Ross State University (Boren 2012).

Many and varied archeological endeavors have been conducted in the eastern Trans-Pecos through the years. For overviews of some of these previous works see Kelley et al. (1940), Lehmer (1958), Mallouf (1985, 1993), Ing et al. (1996), Cloud (2004), and Cason (2005).

Area History

Álvar Nuñez Cabeza de Vaca, Andrés Dorantes de Carranza, Alonso del Castillo Maldonado, and Dorantes' slave, Stephen Estevan, may have been the first Europeans to visit this area of far West Texas in 1535 or 1536 (Bancroft 1884:65; Davenport and Wells 1919:244–252; Castañeda 1976 [1936], Vol. 1:79; Riley 1995:151; Krieger 2002:96). At one point in their travels the group encountered a settled village with fixed dwellings where the people's diet included cultivated crops such as beans, pumpkins, and maize (Castañeda 1976 [1936], Vol. 1:79; Krieger 2002:83). The actual route taken by Cabeza de Vaca and his associates from the Texas Gulf coast to Sonora, Mexico, has long been a point of contention. However, most scholars concur that this village was located at or near La Junta de los Rios and the confluence of the Río Grande and the Río Conchos at present-day Presidio, Texas, and Ojinaga in Chihuahua, Mexico (Bancroft 1884:65; Davenport and Wells 1919:244–252; Castañeda 1976 [1936], Vol. 1:79; Riley 1995:151; Krieger 2002:96).

Alamito Creek drains to the south and empties into the Rio Grande ca. 120 km south of San Esteban and just southeast of Presidio. The Rio Conchos, in the state of Chihuahua, Mexico, flows to the north and joins the Rio Grande immediately northwest of Presidio. The Conchos River valley is also known as the "Concheria." The Conchos River valley in Chihuahua became a major route of travel and discovery as the Spanish pushed northward during the 16th, 17th, and 18th centuries.

The Concheria is bounded on the east by the Bolson de Mapimí and extends westward to the highlands of the Western Sierra Madres. It includes the Casas Grandes area in the northwest and the area of the confluence of the Río Grande and Rio Conchos, known as La Junta de los Ríos, in the northeast (Figure 6) (Griffen 1979:Map 1). This area constitutes part of a region that the Spanish called Nueva Vizcaya.

The central valley region of the Rio Conchos supported a relatively small Spanish mining and ranching community known as Santa Barbara in the Valle de San Bartolome. In the 1560s, the Real y Minas de Santa Barbara settlement was established near outcropping veins containing surface concentrations of silver and gold. Soon, numerous additional ore deposits were discovered and mined in the Santa Barbara area (West 1949:10-11). Within three years, farms, ranches and settlements, required in order to support the mining efforts, were established. Efforts to locate additional ore deposits and other resources, including Indian slave labor, for the mines and haciendas continued apace. By 1580, Spanish slave raids were carried out as far north as La Junta de los Rios (Griffen 1979:2).

Franciscan and Jesuit missionaries were dutifully moving northward during this same period. With the exception of La Junta de los Rios, by 1660 the Franciscans had penetrated the entire area they would occupy during the colonial period. The native peoples of La Junta de los Rios, however, would not become a focus of the Franciscans for another 20 years (Griffen 1979:3).

Figure 6. Reproduction of Griffen's Map of the Concheria (Griffen 1979:Map 1). Drafted by Leticia Wetterauer.

Spanish development of the central Conchos river valley in Mexico would continue for the next 150 to 200 years. By the end of this period, life for the native populations of the region had changed radically. Natives found themselves increasingly restricted to mission towns or small Spanish settlements where they were forced to give up many or most of their customs and required to speak Spanish. The native populations that remained were fairly well-assimilated and acculturated by the early 1700s and they were soon subsumed into Spanish society (Griffen 1979:1-3).

In 1683, a Spanish expedition led by Captain Juan Dominguez de Mendoza, and accompanied by a large group of natives, passed up the Alamito Creek drainage on a route that took the Spaniards to the Concho River (not to be confused with the Rio Conchos in Mexico) area near present-day San Angelo, Texas (Castañeda 1976 [1936], Vol. 1:271–272; Swift and Corning 1988:10–11). Mendoza noted distances traveled in leagues between campsites and he assigned a name to each camp in his journal.

The Mendoza camp near or at San Esteban shelter was either San Nicolas or Nuestro Padre San Antonio based upon distance traveled from the Río Grande and expedition diaries describing the locations. Confounding this determination, these same diaries describe the water holes at both of these campsites as *algibe* or *alxibe* which refers to a cistern or a man-made reservoir constructed of stone as opposed to the more common *abrebadero* or water hole. The San Nicholas watering place is stated in the expedition diaries to be a reservoir fed by rainwater, and rainwater does flow over the drip-line at San Esteban shelter, as it falls into a *tinaja* whose walls are composed of large rocks (Wade 2003:91–92).

On the other hand, Wade (2003:92) places Nuestro Padre San Antonio "about 9 miles south of Marfa, Texas, and on the northwest edge of Mitchell Mesa," which is the approximate location of San Esteban shelter. Mendoza had a cross of timbers erected at both campsites (Bolton 1916:326–327; Wade 2003:92–93). The 1683–1684 Mendoza expedition was the first to officially record the approximate 320 km route between La Junta de los Rios and the Pecos River (Swift and Corning 1988:11).

By the late 1600s Apache groups had acquired Spanish horses (Chipman 1992:15) and had expanded into the area north of the Río Grande (Bolton 1916:321–322), an area formerly occupied by the Chisos Indians (Griffen 1979:14). The increasing frequency of Apache groups appearing along the Río Grande and in northern Mexico may be attributed, in part, to pressure from native groups based further to the north. These northerly groups were also moving southward, as they too were attracted by the resources of the Spanish colonies. This is exemplified by the arrival of the Comanche, the Wichita, and other groups to the Southern Plains and Central Texas in the early 1700s (Chipman 1992:15–17). These Southern Plains groups raided annually into northern Mexico just as Kickapoo tribes, based in the mountains near Muzquiz, Coahuila, Mexico and elsewhere, carried out forays into Texas (Turpin 1995:554).

By 1740, or perhaps earlier, Apache groups were raiding Spanish haciendas and native rancherías deep into the Conchería, and along the Río Grande (Griffen 1979:14). Raids by Apaches and other nomadic native groups continued in the Big Bend area until the early 1880s when these groups were finally pushed southward into Mexico or forced to settle on U.S. reservations. Occasional Indian raids on the Marfa to Presidio road, supposedly committed by natives from San Carlos, Chihuahua, Mexico, continued for a short while longer (Thompson 1985:178, 180).

Connelley's trail, established in 1839, extended from Chihuahua City, Chihuahua, Mexico to Old Fort Towson in southeastern Oklahoma. The southern leg of this trail would later constitute a portion of the Chihuahua Trail that ran north from the Rio Grande along Alamito Creek (Swift and Corning 1988:143-149). Upon reaching Old Fort Towson, steamboats on the Red River could reach freight facilities at Van Buren, Arkansas and Shreveport, Louisiana, similar to those found at Independence, Missouri, that were used by followers of the longer Santa Fe Trail. Connelley's new trail shortened the trade route from Chihuahua City to existing riverboat freight facilities by hundreds of miles (Swift and Corning 1988:35). Portions of Connelley's trail also followed the same route as the ancient lower Salt Road that had been used by native peoples for many centuries, involving salt collecting forays into southeastern New Mexico and areas along the Pecos River (Swift and Corning 1988:36, 75).

Julius Froebel, a German adventurer and naturalist, who had been exiled from his home country, traversed the Chihuahua Trail in 1853 with a group of merchants from Chihuahua, Mexico. The caravan included seven wagons, 100 mules, and a large group of Mexican workers destined for San Antonio, Texas. Apparently, the merchants were to acquire additional

wagons and freight for the return trip, with the extra men to serve as drivers. The caravan moved north up Alamito Creek traveling cautiously at night and resting during the day (Froebel 1859:404-411). The large contingent of additional workers in the caravan may have also served to deter potential attacks by native groups or others who were intent on robbing the caravan. Indeed, concealed in sewn up, wet, bullock hides were parcels of 3,000 Mexican silver pesos that were being carried in the cargo being transported by two of the wagons and destined for the United States (Froebel 1859:404–405). It is estimated that $100,000 or more was carried in the two wagons on this one trip (Swift and Corning 1988:144).

Froebel provided detailed descriptions of the major points along the route, including water sources and campsites. These citations for Alamito Creek, beginning at the Río Grande, are Los Alamos, Punta del Agua (probably near Casa Piedra [Swift and Corning 1988:147]), Cerro de Jacinto (San Jacinto Peak) and a place Froebel called El Saucillo—the Willow Bush. Froebel said that they next arrived at the foot of the porphyry terrace at a place where the road ascends it which was called *Cuesta de San Estevan* (Froebel 1859:412-413). This account from Froebel indicates that the area was already known as San Esteban (or San Estevan) in 1853 when he passed that way. Also note that these place names are in Spanish, an indication that Froebel's companions, and not he, were familiar with the various place names along the drainage as they had traveled the route previously.

Froebel's account and the long prehistoric use of the Alamito drainage as a travel route, along with the possibility that Cabeza de Vaca and his group, including Stephen Estevan, may have passed down or near to Alamito Creek, allows for the possibility that San Esteban shelter may have taken its name from Dorantes' slave in 1535 or 1536. To think that the shelter would or could have kept this same name for 316 years, possible though it may be, does seem unlikely.

Major William H. Emory, of the United States and Mexican Boundary Survey, was in the Presidio, Texas, area in 1852. He and his crews worked to improve a wagon route through the Alamito Creek basin from Presidio del Norte to Leon Springs west of Fort Stockton, Texas. By facilitating travel along Alamito Creek, with its abundant water supply, Emory helped to shorten the trade route from San Antonio to Chihuahua, Mexico, by 300 miles, thus contributing to the establishment of the Chihuahua Trail (Emory 1857:88–89). Once established, the Chihuahua trail was used steadily by freighters and other travelers for at least 40 years (Santleben 1967 [1910]). Wagon ruts can still be seen today in the exposed bedrock of the Mitchell Mesa tuff where the Chihuahua Trail turned to the northeast and passed beneath the bluffs just north of San Esteban shelter (Thompson 1985:42; Swift and Corning 1988:147).

The Kansas City, Mexico and Orient railway was built along the Alamito Creek drainage in the 1920s (Zlatkovich 1981:76). Albert Kimsey Owens first proposed a rail route extending from Norfolk, Virginia, to the Gulf of California seaport of Topolobampo, Sinaloa, Mexico, in 1880. Envisioning an international trade route from Asia to Europe through the United States and Mexico, Owens incorporated the Texas, Topolobampo and Pacific Railroad, a line from Austin, Texas, to the port of Topolobampo. However, he soon encountered financial difficulties that ended his plans (Kerr and Donovan 1968:17).

In 1897, Enrique Creel, a Mexican businessman from Chihuahua, Mexico, incorporated the Chihuahua & Pacific Railroad under the laws of the state of New Jersey. This route was to begin in Chihuahua City, Mexico, and travel over the Sierra Madre to some undetermined port on Mexico's west coast, a rough distance of 372 miles. Creel, too, suffered from financial difficulties and was stalled until the early 20th century when the renowned promoter Arthur Stillwell joined with him to promote the Kansas City, Mexico & Orient Railway (K.C.M. & O.). This route was to extend from Kansas City, Missouri, to Presidio, Texas, across Chihuahua and the Sierra Madres and on to Topolobampo, a distance of 1659 miles. This distance was 459 miles shorter than the extant route of the Union Pacific-Southern Pacific railroad from Kansas City to ports on San Francisco Bay (Kerr and Donovan 1968:17-18).

However, Creel and Stillwell ran into financial difficulties as well, and it was another 30 years, after several reorganizations, before the completion of the route. The rail lines of the K.C.M. & O. had reached Alpine, Texas, by 1913. In the United States these lines were taken over by the Atchison, Topeka & Santa Fe Railway in 1928 and the line was completed to Presidio in 1929 (Thompson 1985:348). The Mexican lines were initially privatized prior to their expropriation by the Mexican government. The Mexican lines were finally completed in 1961 under the new name of Ferrocarril de Chihuahua al Pacifico (Kerr and Donovan 1968:17-19).

The broad Alamito Creek basin served late 19th and early 20th century ranchers as they moved horses, cattle, sheep, and goats to and from central and south Presidio County ranches. Many ranchers provided livestock farm crops to the military post of Fort Davis, located ca. 30 km north of Marfa, Texas. The Alamito Creek basin has served as an excellent route for the K.C.M. & O. railway while also providing an easy northerly route for persons wishing to access the east-west Southern Pacific Railroad at Marfa or Alpine. The Southern Pacific, completed through the area in 1882, followed the route of the historic El Paso to San Antonio road (Thompson 1985:182) that crosses the alluvial flats of Alamito Creek a short distance north of San Esteban Rockshelter. Overall, "[e]arly hunter-gathers, semi-sedentary La Junta farmers, bison-hunting nomads such as the Jumano and Apache, Spanish explorers, and Hispanic and Anglo-American settlers could be expected to have used the Alamito drainage as a major thoroughfare" (Mallouf 1993:10).

The Rock Art

The rock art at San Esteban shelter includes both painted pictographs and engraved, pecked, and scratched petroglyphs. Additional marks, doodles, and initials, some apparently made with a lead pencil, are also noted on some of the rock art panels. The colors used for the painted pictographs are primarily red or off-red (pink and maroon) with other designs painted in black, yellow, yellow-orange, and blue. The blue may have originally been a black paint that has faded to blue over time. Many of the design elements are currently in a highly faded state due, no doubt, to their age and to weathering.

Many of the rock art designs at San Esteban shelter have been damaged by the application of a "modern artist's preservative" that seems to have melted or smeared many of the designs. Some red and black splotches appear to have been red and black pictographs, and some white and yellow films seem to be remnants of the "preservative." In some cases, the film itself now covers and conceals some of the rock art designs. Many of the design elements previously recorded and published are now either non-existent or they are highly disfigured. This was no doubt a well-intentioned, yet ill-conceived, tactic that unfortunately resulted in the destruction and/or disfigurement of many of the rock art images at San Esteban Rockshelter.

Descriptions of Individual Designs

The rock art at San Esteban shelter is located on five separate wall panels and nine individual boulders (see Figure 2). Considering that much of the rock art in the shelter is highly eroded and/or faded, and many designs have been destroyed by the application of a "preservative," it is not possible to relocate or document all of the rock art that once existed here. Only selected designs that were either earlier recorded by Kirkland, Jackson, or Lowrance or by the 2000 field school, and designs that are still visible on the rock today will be treated here. The many red and black "splotches" or paint smears, no doubt represent no longer discernible painted images.

Pertinent rock art descriptions will proceed from left to right across each panel, in turn, as the design elements are encountered, regardless of their vertical position on the panel. Right or left references to the elements of each individual rock art design pertains to the viewer's right or left unless the figure's right or left is otherwise explicitly stated. Each design element is given a unique designation consisting of the panel number and an assigned letter (Tables 1–4).

Panel 1. Rock art design 1-A consists of four small red dots arranged in a square pattern. Panel 1 contains five separate horizontal rows of short vertical marks (1-B, 1-E, 1-F, 1-I, and 1-K) in a red color. It appears that for most of these designs the paint was applied to the rock surface with a finger or a brush. Newcomb and Kirkland 91967:129) note that it is tempting to see these marks as some sort of tally or counting process, such as representing the individual members of a group or the number of animals slain or seen. However, Newcomb and Kirkland (1967:129) simply refers to these marks as "check" marks. As noted below, several examples of "check" marks used in various types of tally systems by native groups in northern Mexico were recorded in Spanish colonial times.

Governor Montaña de la Cueva and his troops put down an uprising involving about 20 native groups in Chihuahua, Mexico in 1645. Following their defeat most of the natives forged a new peace alliance with the Spanish and seven tribes surrendered to Governor Montaña by sending him a piece of paper with six lines or *rayas* and two crosses drawn on it (Griffen 1979:6).

In the 1690s, a group of Tarahumara, Jova, and Concho Indians held a meeting to consider war against the Spanish and their Indian allies. The

Table 1. Descriptive data for rock art designs on Panel 1.

Design Element	Element Description	Color	Size (cm) W X H	Style	Type
1-A	4 dots in square design	Red	4 X 4	Paintbrush or finger	Pictograph
1-B	Horizontal row of 6 vertical check marks	Red	19 X 9	Paintbrush or finger	Pictograph
1-C	Two human-like figures w/broad brimmed hats and possible horse	Red	34 X 35	Paintbrush or finger	Pictograph
1-D	Initials and historic date	NA	7 X 5	Engraved	Petroglyph
1-E	Horizontal row of 4 vertical check marks	Red	6 X 4	Paintbrush or finger	Pictograph
1-F	Horizontal row of 6 vertical check marks	Red	8 X 4	Paintbrush or finger	Pictograph
1-G	Linear designs with arrow shape at one end	Blue or faded black	18 X 10	Natural crayon	Pictograph
1-H	Human-like figure	Red	25 X 55	Paintbrush or finger	Pictograph
1-I	Horizontal row of 4 vertical check marks	Red	4 X 4	Paintbrush or finger	Pictograph
1-J	Human-like figure with arms extended and raised at the elbow	Red	14 X 22	Paintbrush or finger	Pictograph
1-K	Horizontal row of 6 vertical check marks	Red	8 X 4	Paintbrush or finger	Pictograph
1-L	Negative equilateral cross within a boxed frame	Outline and fill are red; cross is unpainted	38 X 40	Paintbrush, finger and/ or crayon	Pictograph
1-M	Human-like figure or possible anthropomorph	Red	12 X 20	Paintbrush or finger	Pictograph

Conchos carried with them a stick with many marks or *rayas* on it. The Conchos bragged that the marks represented many Indians who had already joined their side (Griffen 1979:21).

Several groups of Chinarras Indians, living in Chihuahua, Mexico, west of the valley of the Río Conchos, were noted in 1716 making tally marks on a stick in order to keep track of the number of persons embarking on a journey to found the town of Santa Ana de Chinarras (Griffen 1979:39). In another instance, a group of Jano and Jocome natives and their allies gave some Spaniards a piece of paper covered with unintelligible paintings and markings ("*pintado y escarabajeado*") as a sign of peace (Archivo de Hidalgo del Parral 1695 in Griffen 1979:41).

Interestingly, Keyser and Klassen (2001:100-101), in their discussion of the rock art of the Northwest Plains, relate that groups of tally marks

Table 2. Descriptive data for rock art designs on Panels 2 and 2A.

Design Element	Element Description	Color	Size (cm) W X H	Style	Type
			Panel 2		
2-A	Circular figure	Red	18 X 15	Paintbrush or finger	Pictograph
2-B	"J" design	NA	6 X 6	Engraved	Petroglyph
2-C	Horizontal row of 18 vertical check marks	Red	45 X 24	Paintbrush or finger	Pictograph
			Panel 2A		
2A-A	Two vertical lines with bases	Red	10 X 10	Paintbrush or finger	Pictograph
2A-B	Historic letters	NA	4 X 4	Engraved	Petroglyph
2A-C	Two human-like figures and column	Black	30 X 20	Paintbrush or finger	Pictograph
2A-D	Two human-like figures and quadruped	Black	40 X 20	Paintbrush or finger	Pictograph
2A-E	Vertical column of 10 horizontal check marks	Black	20 X 40	Paintbrush or finger	Pictograph
2A-F	Projectile-like design	Red	12 X 6	Paintbrush or finger	Pictograph
2A-G	Sinuous line and two dots	Red	6 X 40	Paintbrush or finger	Pictograph
2A-H	Vertical column of 16 horizontal check marks	Red	30 X 50	Paintbrush or finger	Pictograph
2A-I	Arrow-shaped design	Yellow	3 X 2	Paintbrush, finger or crayon	Pictograph

are some of the most distinctive characteristics of the Columbia Plateau rock art tradition. Such large quantities of tally marks, as found in the Columbia Plateau Style, do not occur similarly in any other Plains rock art tradition. "At Columbia Plateau sites, the painted [tally] marks were associated with vision questing. Early informants reported that they enumerate spirit helpers, visits to sites, and sometimes days spent fasting at the site" (Keyser and Klassen 2001:296). It has been estimated, from numerous strands of evidence, that the Columbia Plateau Style extends, at least, from the Late Archaic to the Historic period, but "most sites undoubtedly originated during the Late Prehistoric period [A.D.

Table 3. Descriptive data for rock art designs on Panels 3, 4, and 5.

Design Element	Element Description	Color	Size (cm) W X H	Style	Type
			Panel 3		
3-A	Horizontal row of 21 vertical check marks	Red	100 X 20	Paintbrush or finger	Pictograph
3-B	Horizontal row of 5 vertical check marks	Black	20 X 10	Paintbrush or finger	Pictograph
3-C	Horizontal row of 51 vertical check marks	Red	220 X 8	Paintbrush, finger and/or crayon	Pictograph
3-D	Arrow or projectile shape	Yellow with red marks	20 X 20	Paintbrush, finger and/or crayon	Pictograph
3-E	Historic initials	Black paint	30 X 40	Paintbrush, finger and/or crayon plus lead pencil	Pictograph
3-F	Quadrupeds and human-like figure	Red and black	220 X 125	Paintbrush, finger and/or red crayon	Pictograph
3-G	Horizontal row of 6 vertical check marks	Black	20 X 30	Paintbrush or finger	Pictograph
			Panel 4		
4-A	Vertical row of 4 horizontal lines	Red	10 X 10	Paintbrush, finger and/or crayon	Pictograph
4-B	Sinuous line	Red	3 X 13	Paintbrush, finger and/or crayon	Pictograph
4-C	Vertical column of 5 horizontal lines	Red	8 X 10	Paintbrush, finger and/or crayon	Pictograph
4-D	Human-like figure or anthropomorph	Red	18 X 30	Paintbrush, finger and/or crayon	Pictograph
			Panel 5		
5-A	Connected horizontal bars	Red and yellow	30 X 8	Paintbrush or finger	Pictograph
5-B	Curved arch	Black and pinkish-red	30 X 10	Paintbrush or finger	Pictograph
5-C	Initials and	Black	10 X 12	Paintbrush or finger	Pictograph

Table 4. Descriptive data for rock art designs on isolated boulders.

Design Element	Element Description	Color	Size (cm) W X H	Style	Type
B-A	Pronghorn antelope	Red	37 X 46	Paintbrush or finger	Pictograph
B-B	Not discernible				
B-C	Not discernible				
B-D	Not discernible				
B-E	Human-like figure or anthropomorph	Red	35 X 42	Paintbrush, finger or crayon	Pictograph
B-F	Not discernible				
B-G1	Line with oval and circled ends	Black	3 X 25	Paintbrush, finger, crayon or charcoal	Pictograph
B-G2	Upside down U-shape crayon or charcoal	Black	4 X 20	Paintbrush, finger,	Pictograph
B-H	Not discernible				
B-I	Not discernible				

250–1700]" (Keyser and Klassen 2001:98–99). The Columbia Plateau rock art tradition is best known from the interior plateau area of British Columbia, Washington, western Montana, and the western regions of the Northwestern Plains (Keyser and Klassen 2001:93 and Map 7.1).

Keyser and Klassen (2001:296) also note that "[o]ther tally marks were probably used in some sort of notational or counting system. Their arrangement closely resembles the tallies of weapons, horses, and humans noted in Biographic Style rock art, which were used to represent the number of objects captured in battle or the number of coups counted on enemies." This interesting concept will be further discussed below in regard to an arrangement of possible tallied weapons and other items in a painted design, 2A-E, at San Esteban.

Seven separate Athapaskan linguistic groups, found historically in the Southwest, migrated south from a much larger core group of Northern and Pacific Coast Athapaskans. The territory of the Northern Athapaskans was in Alaska and Northwest Canada while the Pacific Coast groups were scattered from British Columbia to Northern California (Goodwin 1987:Appendix A:165). It is not known, conclusively, at what point in time the Southern Athapaskans began their southerly drift but natives thought to be Apache were noted in the Southwest by the Spanish as early as 1541 (Chipman 1992:15). Goodwin (1987:Appendix A:165) believes that it is possible that the predecessors of the Navajo and other Apache groups arrived in the Southwest as early as the 13th or 14th centuries. The locations of the Northern and Pacific Coast Athapaskans in the northwestern portion of the continent correspond roughly with the Columbia Plateau, an area which exhibited an extensive utilization of tally marks in their rock art. Perhaps the widespread use of tally marks in the Trans-Pecos of Texas, as well as in other areas of the Plains and the Southwest, can be attributed to distant cultural traits first developed in the Northwest and carried southward by the various groups that came to be known as Apache.

In those instances, cited above from Spanish colonial documents, it is not known whether the *rayas* or markings on paper were formed in horizontal or vertical rows like the many rows of marks present in San Esteban shelter. It does seem likely that

any man-made marks intended to express meaning would necessarily require some type of organization to be effectual or useful. In the instances noted above, "check" or tally marks served as representational markers or communicative tools and as counting devices. It seems probable that painted or carved rows of marks on rock shelter walls served a similar purpose.

The top of panel 1 is approximately 6.0 m above the shelter floor. Above the panel is a recessed area and beyond that lies another rock art panel (2-A). Near the top of panel 1 is a horizontal row of red vertical check marks (1-B). Also present are two red probable human figures, wearing broad-brimmed hats along with a possible depiction of a horse. These last three images, located under a red painted arch, are designated as 1-C (Figure 7). A set of designs to the right of these include linear designs in blue or faded black (1-G), a red human-like figure (1-H), and a second red human-like figure with arms extended and raised at the elbow (1-J) (Figure 8). These three design groups were either painted from above with the artist(s) leaning out over the panel from the top, i.e., painted upside down (Newcomb and Kirkland 1967:128) or the artist(s) used a pole ladder to reach this height (Lowrance 1988a:100).

Several of these designs on the upper portion of the panel are of special significance. Design element 1-C (see Figure 7), the two solidly painted red figures possibly wearing broad brimmed hats (and possibly including a horse) incorporate characteristics that may indicate that they were created in early historic times. The larger of the two figures appears to have six appendages where human legs would be and a possible looped rein type element extending from the figure's left arm. All four previous recordings of this "horse and rider" design include these six lower appendages. This design may to be an attempt by the artist to represent four horse legs and two rider legs. If this was the intent of the artist, design element 1-C may represent an artist's early attempt at depicting a human on horseback. Interestingly, many rock art sites in the vicinity of San Esteban shelter, as well as in

Figure 7. Enhanced photograph of design 1-C. Photograph by Dawnella Petrey.

Figure 8. Enhanced photograph of design 1-H and design 1-J. Photograph by Dawnella Petrey.

the surrounding counties, include various attempts to illustrate human-like figures on the back of a quadruped. Some of these designs are more clearly depicted than others (Figure 9).

A rock art site recorded by Lowrance (1988a:51) called the Capote-Walker Creek Header is approximately 56 km due west of the San Esteban site. This site includes many representations of what appear to be human-like figures mounted on quadrupeds, most likely horses. Most of these designs are rather more sophisticated than the attempted "horse and rider" at San Esteban. However, one example painted in white somewhat resembles the horse and rider at San Esteban. The juxtaposition of the six legs of the horse and rider presents an unresolved problem for this artist just as it may have for the artist at San Esteban. This white pictograph is one of only two designs with human-like figures that appear to be wearing something like broad-brimmed hats out of approximately 50 designs at the Capote-Walker Creek Header site.

Initially, one might assume that rock art depictions of individuals wearing brimmed hats represent Europeans. However, Spanish advances in Chihuahua, Mexico, in the 16th, 17th, and 18th centuries exposed the native people to extensive European influence. As early as 1637, there were 37 commercial shops in Parral, Chihuahua, and they conducted an active trade with Indian and mestizo laborers. Among other items, many "ready-made clothes: women's skirts, blouses, petticoats; men's doublets, shirts, capes, and hats" were available for purchase (West 1949:83).

Hats were also probably an important item for trade and bargaining between the Spanish and individuals or native groups in Chihuahua. In 1691, General Juan de Retana was commander of the presidio at San Francisco de Conchos on the Río Conchos in Chihuahua. At that time, a large native revolt in the La Junta area had been somewhat quelled but several tribes were still raiding Spanish outposts. Retana sought to bring the revolt to an end by sending gifts to the chief of the Sisimble tribe. This leader was a cacique who was respected by all the other nations. Retana sent gifts to him including a banner and a hat (Griffen 1979:15).

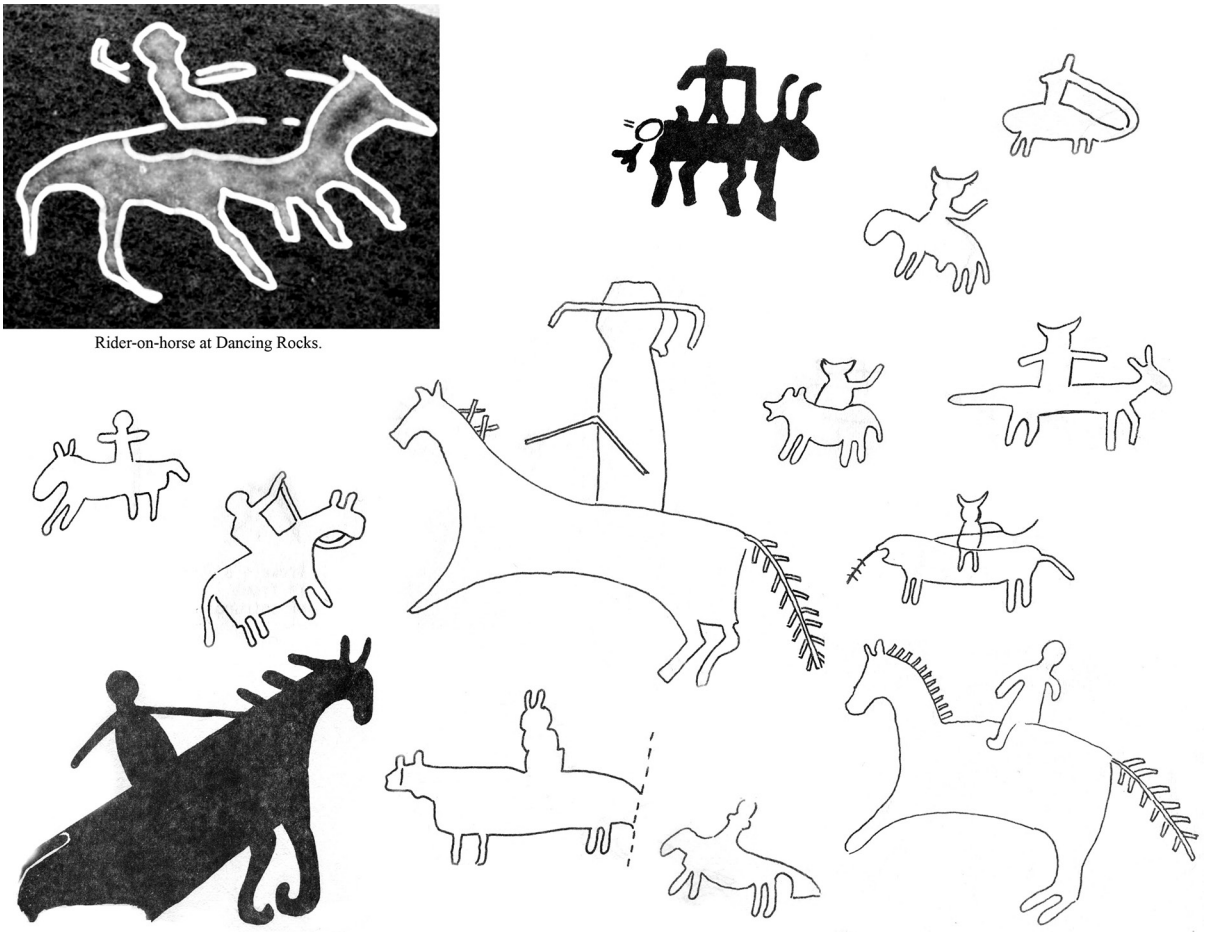

Figure 9. A stylistic comparison of horse and rider motifs found at historic rock art sites in the Big Bend region of Texas (Mallouf 2013:Figure 18). Drafted by David Hart.

Rock art depictions, then, of persons wearing broad-brimmed hats at San Esteban shelter could represent Europeans, or they may represent local indigenous peoples. But rock art depictions in design 1-C were surely created after Spanish contact in the late 16th century.

A design element that appears to be a red arch seems to enclose the possible horse and two human-like figures wearing broad brimmed hats. This arch is formed over the top of the figures, extends farther downward to the left of the figures and terminates with a short line protruding inward at its end. The arch seems to embrace the figures or to set them apart in a way that adds some undetermined significance to the design.

Kirkland recorded a human-like figure painted in black on a rock shelter wall to the north of Leakey in Real County, Texas. This figure has an almost identical arch enclosing it, including the identical, unusual inward extension at the arch's terminus on the left side of the figure. In addition to this arched design, the Real County rock art panel includes three Christian-style crosses painted in red and another human-like figure painted solidly in black wearing a broad brimmed hat and holding a long gun (Newcomb and Kirkland 1967:51). The presence of figures wearing broad brimmed hats, with a horse, an historic weapon, and the extremely similar arches that enclose figures at both sites may provide an historic time frame for the creation of design 1-C at San Esteban Rockshelter. The letters "R. A. Y." with the date "1879" (1-D), plus other supposed dates ("1861" and "68") located elsewhere in the shelter, all attest to visitation at San Esteban in historic times. These historic visits probably began at least as early as 1839 with the establishment of Connelley's Trail from Chihuahua, extending up Alamito Creek, and on to North Texas (Swift and Corning 1988:35).

The blue or faded black linear design elements with a barbed point at one end (1-G), the

red human-like figure (1-H), and the smaller red human-like figure (1-J) appear to be a grouped set of elements. A horizontal row of four red check marks (1-I) painted at a slight vertical angle separate figures 1-H and 1-J. These check marks may have been added after the completion of images 1-H and 1-J, as it appears that they have been forced into the space between these two images. Design 1-K consists of a horizontal row of six vertical red check marks.

A boxed equilateral cross design (1-L) (Figure 10), the only negative-style rock art design at San Esteban Rockshelter, is quite unusual. While positive and negative handprints appear in the inventory of rock art sites in both the Old and the New World (Smith 1925), negative-style rock art designs depicting images other than handprints are not common. Interestingly, handprints are not present in the rock art at San Esteban; however, five members of the 2000 TAS/CBBS field school were invited to a nearby ranch, where they recorded a series of outlined hand and finger prints located on the sooty walls and ceiling of a small alcove (Teddy Lou Stickney, personal communication 2015).

Kirkland recorded positive and negative handprints along with other images on the walls and ceilings of two rock shelters at the Indian Water Hole site in Terrell County, Texas. Included among these designs were two negative images on the ceiling of one of the rock shelters. One of the designs was a circular object or hoop and the other was an apparent hunting bow. They were created by holding the object against the rock surface and spraying liquid pigment, possibly from the mouth, around the object (Newcomb and Kirkland 1967:122-123; Smith 1925:10).

In this particular instance, the presence of the bow in rock art serves to provide a relative date for the art. The bow is thought to have arrived in the general area between A.D. 300–500 (Mallouf 2000), suggesting that this rock art was created at some point in time during or after that period. Arriving at a similar relative date for the boxed equilateral cross image (1-L) proves to be more of a challenge.

Figure 10. Enhanced photograph of a red, negative-style equilateral boxed cross, design 1-L. Photograph by Robert J. Mallouf.

This boxed cross image (1-L) is symmetrical in design. Each of the four arms of the cross measure ca. 16 cm in width. The horizontal arms are ca. 30 cm in length while the vertical arms are ca. 34 cm long. The box framing the cross measures ca. 38 x 40 cm.

The design is quite interesting with regard to the technique used in its creation (see Figure 10). The cross itself is not colored but rather implied by outlining and shading. Various shades of red are the only colors utilized on the design. The border of the box and the border of the cross were reinforced with repeated layers of color to darken them, while the fill color of the box is a somewhat lighter red.

The cross in design 1-L may have been inspired by the Christian cross that was carried by representatives of the various religious orders who accompanied the Spanish entradas. If indeed influenced by Christian symbolism, this pictograph could relate to the earliest contact between Spaniards and Native Americans at La Junta de los Rios in 1535 or 1536.

Cabeza de Vaca and his three companions were believed to be medicine men by the native tribes they encountered on their journey. Their method of curing involved making the sign of the cross over the heads of the sick and blowing on their bodies, thereby curing them (Castañeda 1976 [1936], Vol. 1:70). The Spaniards continued this practice throughout the journey until, "[i]n western Texas their fame as medicine men increased till their progress was seriously impeded by crowds clamoring to be healed, or even to touch their garments" (Bolton 1990 [1949]:9–10). Witnessing these purported acts of healing or, indeed, merely hearing accounts of healing by means of the symbol of a cross, could have provided adequate impetus for an individual to create the boxed cross at San Esteban shelter.

Bolton relates that in November 1539, Melchor Díaz with a small troop of soldiers, was sent ahead of the Coronado expedition in order to verify the report of Fray Marcos de Niza, who had earlier journeyed to Cíbola. Once north of the Sinaloa River, in order to pacify native groups encountered along the way, Díaz followed a practice previously utilized by Fray Marcos and Stephen Estéban. "Each day… he sent messengers ahead with a cross to the place where he intended to camp, 'because this was a symbol the Indians regarded with deep veneration, erecting a house of mats in which to place it. Somewhat apart from this shelter they made a lodging for the Spaniards, drove down stakes to which they could tie the horses, and supplied them with fodder and an abundance of maize wherever they had any'" (Bolton 1990 [1949]:51, 87–88).

Prior to the death of Stephen Esteban at the Zuñi pueblo of Háwikuh (Bolton 1990 [1949]:33–35; Castañeda 1976 [1936], Vol. 1:90; Krieger 2002:140; Riley 1987:17), the Cíboloans and other native groups considered the Spaniards to be immortal. The Christian cross served as an iconic representation of this supposed Spanish immortality and of the fact that they were descended from the sun. Bolton (1990 [1949:91) relates that the Franciscan friars "were bearers of the Cross, a symbol which, through Cabeza de Vaca, Fray Marcos, and Díaz, had already come to exert an influence over the natives."

Beginning in 1581, numerous Spanish entradas, including religious friars, began to pass through La Junta de los Rios, a location a mere 120 km south of the San Esteban shelter. Most of these entradas erected wooden crosses in the villages that they encountered and at the places they camped. Prior even to this date, Spanish slavers had impacted native communities as they raided to the north as far as the Rio Grande and, perhaps, farther (Castañeda 1976 [1936], Vol. 1:157–158). No doubt many of the enslaved natives witnessed the Christian cross of the Spaniards before they escaped or were released back to their homes in the north. In November 1750 Captain Alonso Rubin de Celis, commander of the presidio at El Paso, was ordered to La Junta to scout for a building site for a presidio. As his party approached San Juan Bautista, it was met by 50 mounted warriors "bearing a red silk flag with a cross in the center" (Morganthaler 2007:113).

Many historic native cultures have incorporated cross imagery into their iconographic symbol systems. Wade (2003:230) notes that "[t]he widespread use and appropriation of the symbol of the cross is intriguing. The cross appears in a multitude of groups, including the Julime, Jumano, Gediondo, Tejas, Payaya, and Apache. The cross was used as a symbol of friendship, a talisman, and a standard in battle and in festive parades."

The Rio Grande Tewa people raised wheat, a Spanish food plant, accompanied by Christian rites. "A small cross…made of two twigs, with sprigs of pinon and juniper cedar tied to it with strips of yucca, is carried to the church at Santa Cruz to be blessed by the priest. After wheat sowing, this cross is stuck in the field to benefit the crop,

much as the Tewa of Hano set up prayer sticks and feathers in their maize fields. When the wheat has been harvested the cross is brought home and put away in the house. If a young boy should die, this cross would be laid on his breast" (Robbins et al. 1916:108).

Watson Smith (1952:243) relates "[i]t is interesting to note that the modern Hopi prayer-stick for sheep and cattle is a Latin cross to which has been tied feathers, herbs, etc. This, of course, has nothing to do with the older form of Pueblo cross, but doubtless is an adapted Christian emblem, associated with those animals that first came into the country with the friars who also bore the cross." Considering that a group of nine quadrupeds with a strong resemblance to domesticated cattle (3-F below) are found painted on a wall of San Esteban shelter, there is a possibility that there could be a Puebloan or similar influence in the rock art here and the boxed cross may have some relationship to the depiction of the quadrupeds.

In regard to this association between the cross and livestock among the Puebloan peoples, it should be noted that the interior space (under the drip line) of San Esteban shelter is entirely compatible for use as a holding area for livestock. This interior space is enclosed to the north and east by the shelter walls, on the south by a massive and elevated boulder pile, and on the west by the *tinaja*. This western flank is also elevated and sloped inward toward the shelter interior, and the remnants of a stacked rock wall, about 4 m long and 1 m tall, is still present along a portion of this western flank (see Figure 2). It appears that very little effort would be required in order to confine some livestock within the shelter. Considering San Esteban's location on the Chihuahua Trail, it seems probable that the shelter did occasionally serve as a location to secure the oxen used to pull the massive wagons (*carretas*) of the Mexican traders or the mules used by the freight wagons traveling the Chihuahua trail.

The symbol of the cross, however, was not exclusive to Spanish Christians. Several native groups, such as the Jumano, are known to have had a presence in the Trans-Pecos area, and they also had connections with the Río Grande Pueblos in New Mexico (Seymour 2014). There are also accounts of the Jumano Juan Sabeata displaying a Christian cross while traveling (Wade 2003:Figure 4.2), possibly as an effort to influence the Christian Spaniards encountered along the route. At times the Mescaleros and other Apache groups maintained a close and peaceful trade relationship with the Puebloans. "Their [Apache] knowledge of agriculture and many cosmological and mythological beliefs and practices, perhaps, including their visual expression in pictographs and petroglyphs, were probably borrowed from or heavily influenced by the Pueblos" (Newcomb and Kirkland 1967:189–190).

Bourke (1892:479) noted that among the Apache, the cross, in one manifestation, is related to the cardinal points and the four winds, and that warriors would paint the cross symbol upon their moccasins when they went into unknown territory to keep them from taking the wrong trail. Considering the location of San Esteban Rockshelter along a well-watered and often used trail, perhaps this cross painted on the rock shelter wall served as a type of trail marker for the Lipan or Mescalero Apaches. As noted above, it is thought that these Apache (Athapaskan) groups migrated from northwestern North America, Alaska, Canada, and the Pacific Coast (Goodwin 1987; Goddard 1996:74–75), eventually arriving in the Texas Big Bend between A.D. 1600-1700 (Mallouf 2000). Others have suggested that these Apache groups were on the Southern Plains and in Arizona, New Mexico, and far West Texas several hundred years earlier (Goodwin 1987; Chipman 1992; Seymour 2012).

Between 1958 and 1961 mural frescoes from the walls of 17 different prehistoric Pueblo kivas were recorded at the Anasazi Pottery Mound site. This site, located just southwest of Albuquerque, New Mexico, thrived from A.D. 1300-1475. At least five of the kivas had up to 38 separate layers of murals, and a total of more than 800 mural frescoes were unearthed (Hibben 1975:xii-xiii, 16). Hibben provides illustrations of portions of 109 of the recovered murals. Two of these depict framed equilateral crosses, apparently serving as necklaces, on two individual figures (Hibben 1975:45, 58) (Figures 11-12).

Schaafsma (1972:25, 27 and Figure 20) noted that in the rock art of the Plateau Anasazi in the Upper Little Colorado River drainage, "among the abstract designs, frets, concentric circles, equilinear crosses, and wavy lines are prominent. The outlined cross was mentioned above, this being the most distinctive element among the abstract figures." A Mimbres influence which is thought to be present in this Plateau Anasazi rock art suggests "a post-A.D. 1000 date" (Schaafsma 1972:27).

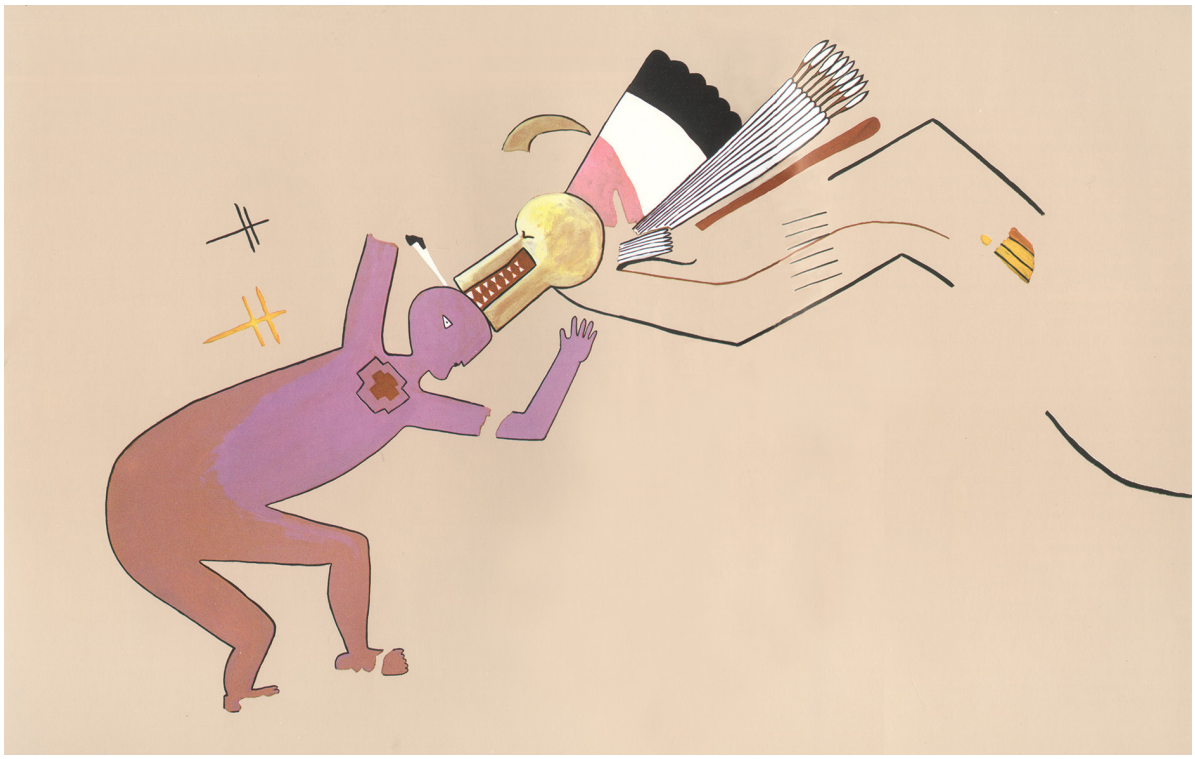

Figure 11. Image from Pottery Mound, Kiva 9, Layer 8, South Wall. Kiva Art of the Anasazi © 1975 by Frank C. Hibben. Courtesy KC Publications, Inc.

Figure 12. Image from Pottery Mound, Kiva 7, Layer 18, SW corner. Kiva Art of the Anasazi © 1975 by Frank C. Hibben. Courtesy of KC Publications, Inc.

Schaafsma (1972:96 and Table 2), again, discussing Mogollon petroglyphs tabulates five outlined crosses which were recorded in Luna County, New Mexico in the Mimbres culture area. The outlined cross is seen frequently in the Reserve petroglyph style of the Mountain Mogollon in the San Francisco and Tularosa River drainages in western New Mexico, as well as in the more eastern Jornada style. It is also a common design element in the rock art of the Sinagua culture in the Flagstaff and Verde valleys of north central Arizona (Bostwick 2001:421).

Schaafsma (1972:80-88) hypothesizes that the Reserve style corresponds with the Anasazi impact on the area around A.D. 1000 and the Jornada style is thought to appear first in the Mimbres division of the Mogollon, also about A.D. 1000. Pueblo cultures of the Upper Rio Grande in New Mexico made use of the Jornada style from sometime after A.D. 1300 into the historic period.

A petroglyphic enclosed cross has been recorded at the Indianhead Shelter 3 site near Study Butte, Texas, in Big Bend National Park. In addition, rock art at Shelter 2 at Indianhead included a black solidly painted equilateral cross that was not enclosed (Lowrance 1982b:Plates CLIV, CXXX). Lowrance also recorded an equilateral cross, apparently in black paint, in a rock shelter in Chalk Draw in central Brewster County, Texas. She noted that this cross is similar to a cross painted in yellow in the San Francisco rock shelter and to an orange painted cross in the Ernst Tinaja rock shelter (Lowrance 1982a:23), both also in Brewster County. None of these last three crosses are painted solidly but, rather, the paint simply forms the outline of equilateral crosses. These last three painted crosses noted by Lowrance are not enclosed or boxed.

A small red pictograph located on the Marfa Plain in Presidio County depicts two simple crossed lines, creating an equilateral cross, placed within a rectangular box measuring ca. 8 x 10 cm (Robert Mallouf, personal communication 2009). Additionally, many simple equilateral crosses can be found in the rock art of Trans-Pecos Texas, and all may well have prehistoric affinities.

While I have demonstrated the widespread utilization of the cross symbol in both prehistoric and historic rock art contexts, Maria Wade (2003:230) relates the following regarding the cross design and native cultures:

> Only some items of European material culture interested the Native Americans in the early period. They were interested in clothing, horses, and symbolic elements, such as drawings, pages of books, and the cross. The widespread use and appropriation of the symbol of the cross is intriguing. The cross appears in a multitude of groups, including the Julime, Jumano, Gediondo, Tejas, Payaya, and Apache. The cross was used as a symbol of friendship, a talisman, and a standard in battle and in festive parades.

In summary, the cross appears in the iconography of numerous prehistoric and historic native cultures of the Southwest and beyond. While the crosses found in the pictographs and petroglyphs of the Anasazi, Mogollon, Jornada, Pueblo, and other cultures are not exact replicas of the boxed cross design at San Esteban shelter, they are usually equilinear and they are often outlined or framed. The Christian cross is less similar in that it is not equilinear nor is it usually represented in outlined form. These few accounts of crosses, however, in association with various native and historic cultures, illustrate that the influences that inspired an artist to create the boxed cross at San Esteban shelter may have derived from any number of sources.

Figure 1-M, located on Panel 1 about 160 cm below the boxed cross (1-L), is painted solidly in red. This design is a human-like figure or a possible anthropomorph. The upper portion of this figure is smeared and is not discernible today. There remains enough of the image to see that the design narrows at the "waist" and then flares out at the bottom, indicating the remains of an hourglass-like figure. Two legs with feet protrude below the lower edge of the design.

Kirkland (Newcomb and Kirkland 1967), Jackson (1938), and Lowrance (1988a) each recorded similar but varying images for this figure. Jackson included images of the two red figures possibly wearing broad brimmed hats and a possible horse (1-C), the red boxed cross (1-L), and the figure presently under discussion (1-M) under the heading "Evidences of European Contacts" and he stated that figure 1-M is "an Indian representation of a white woman" (Jackson 1938:102).

Lowrance represented figure 1-M much the same as Jackson; the two differences being that the very top of Lowrance's figure was somewhat pointed and she indicated a left arm and hand with fingers extended downward. Both she and Jackson recorded short protrusions extending upward from either side

of the top of the figure. Figure 1-M is, apparently, the image referred to by Lowrance (1988a:103) as "the headless woman." Peabody (1909:129) also referred to a headless human figure in his early description of the San Esteban rock art, possibly in reference to this pictograph. Lowrance (1988a:100) attributed this figure (1-M), the boxed cross (1-L), "nine horned cattle, and a horned devil-like figure" (to be discussed later) to mission influence from the La Junta area.

Kirkland, known to be extremely precise even to recording exact spatial relationships of rock art images in a particular setting, recorded a somewhat different image for figure 1-M (Newcomb and Kirkland 1967:129). Kirkland's painting had the same hourglass-like imagery with two legs and feet extended below, but indicated the arms of this figure were spread out to each side and bent slightly upward at the elbow. Appendages suspended downward from each arm near the elbow were also present on Kirkland's figure. The appendage on the left arm was somewhat longer than the one on the right. The very top of the figure was rounded and appeared to have a dent or a slight depression at the crown and two short "antennae-like" protrusions.

An hourglass design was recorded by Kirkland (Newcomb and Kirkland 1967:140-142) and mentioned by Jackson (1938:141-145) at Blue Mountain in a small rock shelter about 65 km northwest of Odessa, Texas, in Winkler County. The Blue Mountain image is painted in red with the lower portion of the hourglass and the legs and feet painted solidly, and the upper portion of the hourglass rendered in outline only. A single solid line protrudes from the upper center of the figure where a head might be. There are no arms or hands. Kirkland did not note a European influence in the images at Blue Mountain, but Jackson (1938:102) suggested the presence of "a white woman," possibly referring to the hourglass figure (Newcomb and Kirkland 1967:141).

Blue Mountain rock shelter was excavated in 1938 (Holden 1938:208–221). Kelley (1986:89) reported that the findings reflected the peculiar combination of projectile point types that are associated with the La Junta region. Other artifacts found at La Junta and also recovered in the Blue Mountain rock shelter excavations included plain and engraved bird bone tubes and sherds of Chupadero Black-on-White ceramics.

The Chupadero Black-on-White ceramic ware is found throughout southern New Mexico, northern Mexico, and west Texas. This ceramic type may have been manufactured between ca. A. D. 1150–1400. It is a very common ceramic type that was traded to the Jornada cultures, who lacked a black-on-white type (Runyan and Hedrick 1987:46-47). Chupadero Black-on-White, as well as other Southwestern ceramic sherds, have been recovered from sites in the La Junta region that date from ca. A. D. 1200-1400. After ca. A.D. 1400, Southwestern ceramics from New Mexico and northern Chihuahua, Mexico are not found in the La Junta region (Kelley 1986:82; Kelley et al. 1940:31-36).

At least four additional hourglass designs resembling human-like figures exist at Hueco Tanks in El Paso County, Texas. All four figures have arms and legs. One is painted solidly in red, two are painted solidly in a dim or brownish-yellow color, and the fourth is painted in white with a black outline on either side of the main figure. This white and black figure is headless with one arm and fingers extended downward, and the other arm may possibly rest on the hip. The other three figures are represented with heads. The two yellow figures are phallic and one of them has horn-like protrusions on the head (Newcomb and Kirkland 1967:185, 187, 202 and Plates 124:1-A and 134:14-B).

Intense cultural interaction occurred between the Navajo and Puebloan peoples of North Central New Mexico beginning around 1540 (Schaafsma 1980:301). This interaction intensified around the time of the 1680 Puebloan revolt against the Spanish. By the time of the Spanish Reconquest of 1696, the Navajo had settled a little further to the west along the drainage of the Upper San Juan River and to the north in the Gobernador District. At this time, many Puebloans fled to the Navajo to evade the vengeful Spaniards and many of these refugees remained. Between this time and 1775 the Navajo adopted many cultural traits, including agriculture, some social and religious beliefs, and artistic styles and techniques from the Puebloan people (Schaafsma 1980:301–333).

These areas in northern New Mexico and along portions of the upper San Juan River drainage and the Largo and Gobernador drainages to the south, constituting the former Navajo homelands, encompass a rock art style designated as the Gobernador Representational Style. Schaafsma (1980:306) explains the interaction of the Navajo and Puebloan peoples in relation to artistic influences:

> The portrayal of religious subjects in graphic form by the Navajo seems to have resulted from adopting the practices of the

> resident Pueblo population, who made petroglyphs in profusion in the Rio Grande drainage and who also make kiva murals, altar paintings, and dry paintings in connection with ritual functions. As we might expect, the Gobernador Representational Style is similar in both style and content to that of the contemporary Pueblos and is thus a further manifestation of the Jornada–Rio Grande art tradition and its associated ideology.

Two major deities in Navajo mythology are the War Twins, who are children of the Sun and Changing Woman. The elder twin is sometimes called Monster Slayer and the younger is known as Born-for-Water. The twins, or symbols that represent them, are often found in 18th century rock art. A common symbol representing Born-for-Water (Child-of-the-Water among Apache groups) is the hourglass figure often found on masks or drawn on the body. The hourglass design alone can represent this deity. In Pueblo imagery, the hourglass symbol is sometimes included in the designs painted on warrior's bodies. The hourglass, often drawn in charcoal or engraved into the rock, is "distributed from the Guadalupe Mountains across southern New Mexico to the San Pedro River Valley in Arizona" (Schaafsma 1980:312–315, 335). This design is also quite common in the eastern Trans-Pecos region. A petroglyph, located at a rock art site in central Brewster County, depicts an hourglass figure beside a probable projectile point design (Figure 13).

Some of the most extravagant and intriguing rock art images in North America are found in the lower extremes of the canyonlands along the Devils and Pecos rivers in southwest Texas and southward for an additional 145 km into northern Coahuila, Mexico (Turpin 1989b). Four independent rock art styles have been identified for the region: the Pecos River Style, Red Linear Style, Red Monochrome Style, and Bold Line Geometric Style (Turpin 1984, 1986a, 1986b, 1990; Boyd 2003; Boyd et al. 2013).

Anthropomorphs, many believed to be of a shamanic nature, are depicted on many of the walls of the rock shelters and cliff faces (Newcomb and Kirkland 1967:43–58, 75). A large number of these anthropomorphic figures have elements suspended from or attached to the arms near the elbows just as does Kirkland's reproduction of the image of figure 1-M at San Esteban Rockshelter.

Newcomb and Kirkland (1967:44 and Table 1) tentatively divided the Pecos River Style shamanic figures into four style periods with the Period 1 style being speculative only. Newcomb and Kirkland's (1967) Table 1 is not accurate as additional shamanic anthropomorphs were recognized after the initial creation of the table but were not included in the actual

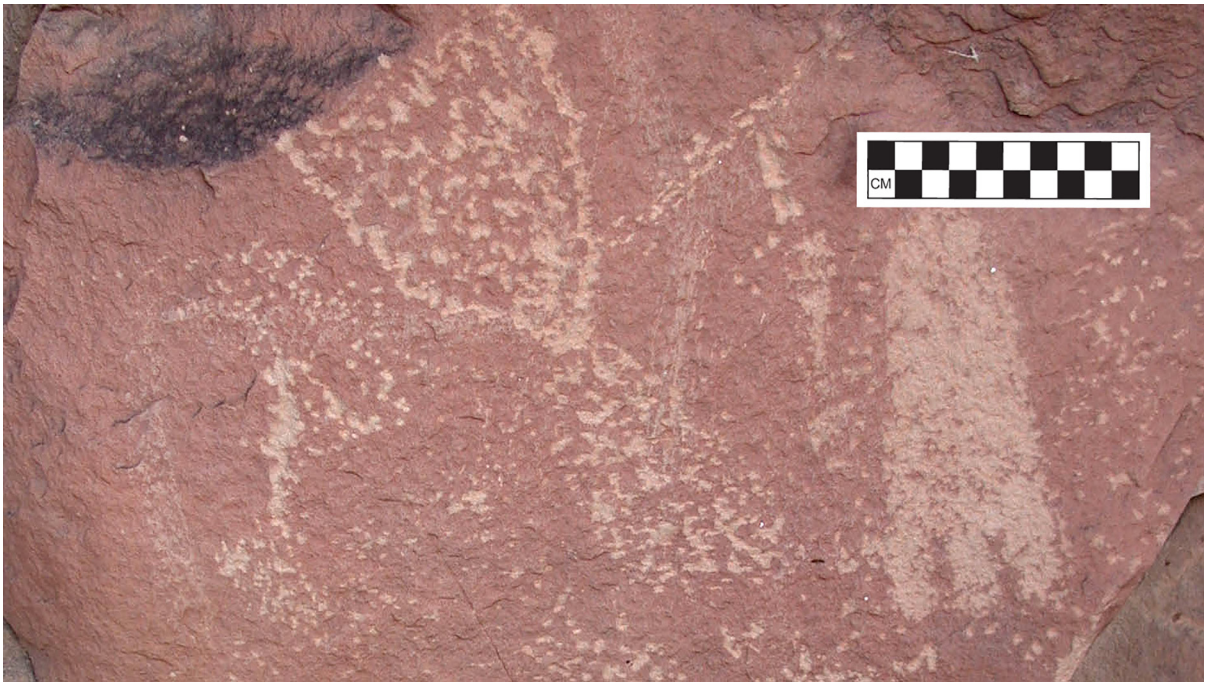

Figure 13. Hourglass-shaped petroglyph from central Brewster County, Texas. Photograph by Dawnella Petrey.

tabulation of distinguishing characteristics. Newcomb and Kirkland (1967:44-49 and Table 1), however, state that 75 percent of the 60 Period 2 shamans, 27 percent of the 83 Period 3 shamans, and 20 percent of the 10 Period 4 shamans are depicted with appendages attached to the arms.

These percentages indicate that items appended to the arms of shamans in the Pecos River Style rock art, especially in the Period 2 style, were significant components of the iconography of shamanic representations. The exact nature and identification of these arm appendages is not known, although they may be representative of the shaman's animal familiars or helping spirits in animal form (Boyd 2003:55).

Boyd (2003:60) relates that a shaman involved in a journey to the otherworld is "associated with an animal or is adorned with the attributes of a particular animal. This aspect of the motif has been explained as the union of the shaman with his or her animal familiar." The figure depicted in 1-M may represent a shaman with animal familiar(s) attached to the arms as in the Pecos River Style rock art.

Lowrance and possibly Peabody referred to 1-M as a headless figure. Referring to Newcomb's Table 1 once again, of the 139 shamanic figures tabulated, 28 of them are headless (Newcomb and Kirkland 1967:44). Figure 1-M, however, may not be headless at all. The 2000 TAS/CBBS field school recorded the "remains" of this smeared figure. Field school participants noted the presence of a natural hole in the rock wall located exactly where this figure's head could be expected to be located.

Natural features located on rock surfaces are sometimes incorporated by native artists into rock art designs (Schaafsma 1980:265). Anthropomorphs, quadrupeds, and other designs are sometimes located near cracks, crevices, or holes on a rock surface, giving the impression that the image is entering or emerging from the rock through the crack or hole (Whitley 1998:17–18).

In this case the natural hole in the rock face above figure 1-M may represent a portal through which the shaman can access the otherworld. In addition, the hourglass figure in 1-M and the boxed equilateral negative cross (1-L) are both situated at the far right end of Panel 1 near where it joins with Panel 2. At this juncture there is a long vertical crack between the panels. This crack could also have served as a portal. Further, the boxed equilateral negative cross (1-L) may very likely be a candidate as a portal to the otherworld itself.

Boyd (2003:42) describes a motif found in the Pecos River Style pictographs as a crenellated arch with a circular opening near its center. An anthropomorph that may be located above, below, or behind the portal should be seen as involved in an otherworldly journey. Caves and cave-like niches themselves, such as at San Esteban Rockshelter, are often seen as very important places as they function worldwide as symbols for passageways to other worlds and/or alternate realities (Boyd 2003:49, 113; Eliade 1964:41, 51, 389; Ortiz 1972:135-158).

In summary, cultural influences or affinities for Figure 1-M are as follows: the arm appendages and those found on anthropomorphic entities in the Pecos River Style rock art are very similar. The hourglass configuration of Figure 1-M is related to both Puebloan rock art and mythology and to painted hourglass figures found at Hueco Tanks and in the eastern Trans-Pecos. The Hueco Tanks rock art is accredited to Puebloan cultures and to the Mescalero Apache. Some Apache groups were heavily influenced by Puebloan cultures in the areas of mythology, horticulture, and art styles and techniques (Newcomb and Kirkland 1967:173–203). Further, the painted hourglass figure at Blue Mountain rock shelter may be coeval with Chupadero Black-on-White ceramics also found in that rock shelter. This ceramic type occurs in Arizona, New Mexico, and northern Chihuahua, and was known to have been traded into La Junta de los Rios. Interestingly, assorted projectile point types found at Blue Mountain Rockshelter are also common at La Junta de los Rios.

Panel 2. Design element 2-A (Figure 14) is located at the extreme north end of Panel 2 where this panel intersects with the east end of Panel 1 (see Figure 2). The design consists of a circular globular figure located within a small niche, about 1.0 m deep, and just wide enough for an average person to enter standing upright. Design 2-A is very near the boxed equilateral cross (1-L) and the possible anthropomorph (1-M) on Panel 1. This image is drawn solidly in a light reddish color. At the top of the figure, two appendages, apparently legs and feet, extend upward. Opposite the legs and feet, at the bottom of the design, a set of two antennae-like extensions or fringes protrude downward. The overall design of this figure suggests that the figure is upside down. On the right side of the main figure are three additional free-standing arches painted solidly in red.

Neither Kirkland nor Jackson recorded design 2-A. Lowrance recorded a simple blob with a circular spot at the lower left and three angular or

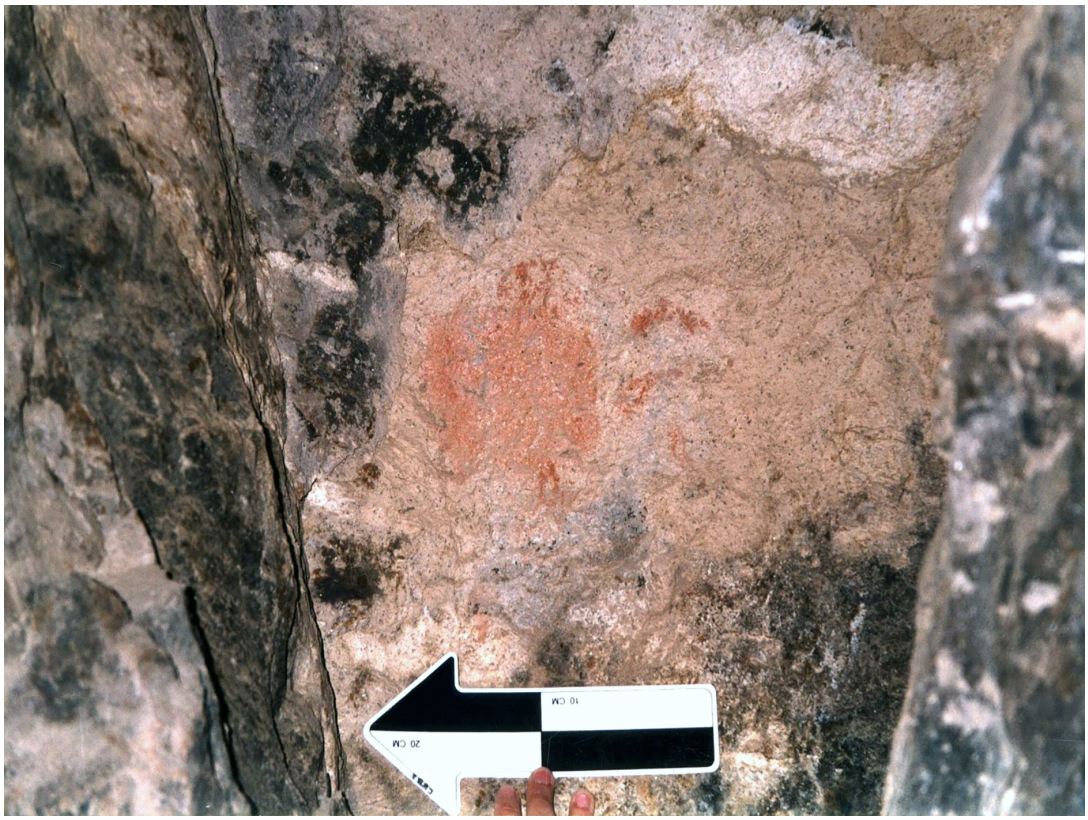

Figure 14. 2002 photograph of pictograph in design 2-A. Photograph by Dawn Temple.

bowed items to the right of the blob. Design 2-A was recorded by the 2000 TAS/CBBS field school. A color photograph taken in 2002 validates the 2000 recordation. Today, however, only small portions of the design are visible on the shelter wall beneath some type of coating (Figure 15). The coating is a creamy white color and does not appear to be a mineral accretion and not the same as the "preservative" mentioned earlier in connection with so much of the rock art at San Esteban Rockshelter.

Design 2-A is unique in its style, shape, and proportions. Circular rock art designs, especially those with human-like body parts such as arms, legs, and heads, are often categorized as shield-bearing figures. However, shield-bearers often, although not always, include some type of weapon and, at least, a head projecting from behind the shield. Rarely, if ever, are true shield-bearers limited to only two legs and feet and antennae-like appendages; shield-bearers are not commonly portrayed in an upside-down position. The example at San Esteban shelter, therefore, does not fit neatly into the shield-bearer category.

Images similar to design 2-A occur in several additional regional rock art locations. Some of these sites can be found in the immediate vicinity, while other sites are more distant. Several circular figures with unusual appendages were recorded in Presidio County, at a site called McComb Creek-Site 1 by Lowrance (1988a:Figure 25). The McComb Creek site is located approximately 42 km due west of San Esteban Rockshelter. One of the circular figures at the McComb Creek site is remarkably similar to design 2-A at San Esteban. This is a circular figure with two legs and feet and two upward extensions in the area where a head may be located (Figure 16). No other appendages or features are present on this figure. Lowrance (1988a:27) states that this circular figure, which she calls a sun symbol, is painted in a white color, but it is not clear if it is painted solidly or simply outlined. Notably, several equilateral crosses having similarities to the boxed cross at San Esteban are also present at the McComb Creek site.

The capital letter "J" (2-B), is scratched into the rock about midway along Panel 2. A few

Figure 15. 2012 photograph of design 2-A showing destruction of pictograph. Photograph by the author.

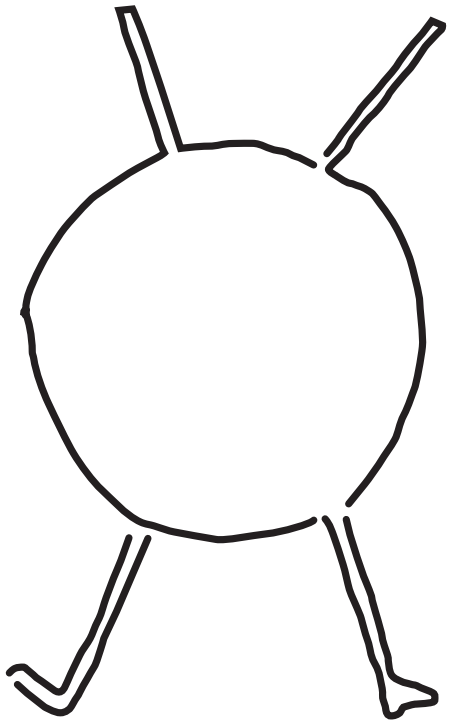

Figure 16. Detail of pictograph drawn in white at McComb Creek-Site 1 in Presidio County (Lowrance 1988a:Figure 25). Courtesy of the El Paso Archeological Society.

illegible squiggles follow the "J." At the far right end of Panel 2, about 41 cm above the ground surface, is a horizontal row of 18 vertical red check marks (2-C). These check marks appear to have been created with a finger or possibly a brush. Additional areas of smeared red color are discernible on the panel.

Panel 2A. Panel 2A, located on a high ledge along the east wall of the rock shelter, is situated above Panel 2. A rock ledge slopes upward along the east wall and toward the north, allowing access to Panel 2A, as well as to a sheltered area with a low ceiling located above Panel 1. The bottom of Panel 2A is about 6 m above the dirt floor of the shelter. As Panel 2A slopes upward from south to north, a large portion of the panel is very close to the ceiling and very little light penetrates into this area and the area above Panel 1, creating an aura of seclusion. However, prior to the completion of the 1920s era railway just outside the rock shelter, additional sunlight might have shone into this area. Beginning at the north end of this panel and progressing toward the south, design 2A-A is first encountered,

consisting of two vertical red marks with bases. They both resemble upside-down capital Ts. Next on the panel, scratched into the rock face, are what appear to be the letters "HI" (2A-B). This design appears to be a fairly modern creation.

A grouping of three figures painted in black constitutes the next design (2A-C) (Figure 17). The first of the three figures resembles a column or pillar. It tilts slightly to the right towards two human-like figures. A group of black dots or marks appear above and to the upper left of the pillar. The two side-by-side human-like figures seem to be approaching the pillar. Both of the human-like figures are rounded on their bottom halves, and there are no legs or feet indicated. Both have their arms out to the sides in somewhat natural positions, but in a fashion that implies motion. The surmised action in this scene, however, does not lend itself to a fuller understanding of what is occurring with the figures. Participants in the 2000 TAS/CBBS field school produced a watercolor reproduction of design 2A-C (Figure 18).

The next design on panel 2A consists of two human-like figures and a quadruped (2A-D). This rock art depiction could not be relocated in San Esteban Rockshelter, but it is known to have been located on panel 2A. The following discussion is based upon a field drawing that was created by participants in the 2000 TAS/CBBS field school. All three figures are painted in outline rather than solid form. The shape of the first human-like figure resembles a triangle with the base at the top representing the shoulders and the apex below representing the waist area. Two short lines resembling legs protrude below. The head is also in outline form. A downward arc is placed horizontally across the upper chest, resembling a necklace, and a vertical line dissects the figure's chest. The left arm is fairly short and the longer right arm is held away from the body. The right hand of the figure appears to be holding or reaching for a circular item.

The second human-like figure has a smaller, but similar, triangular-shaped chest area including

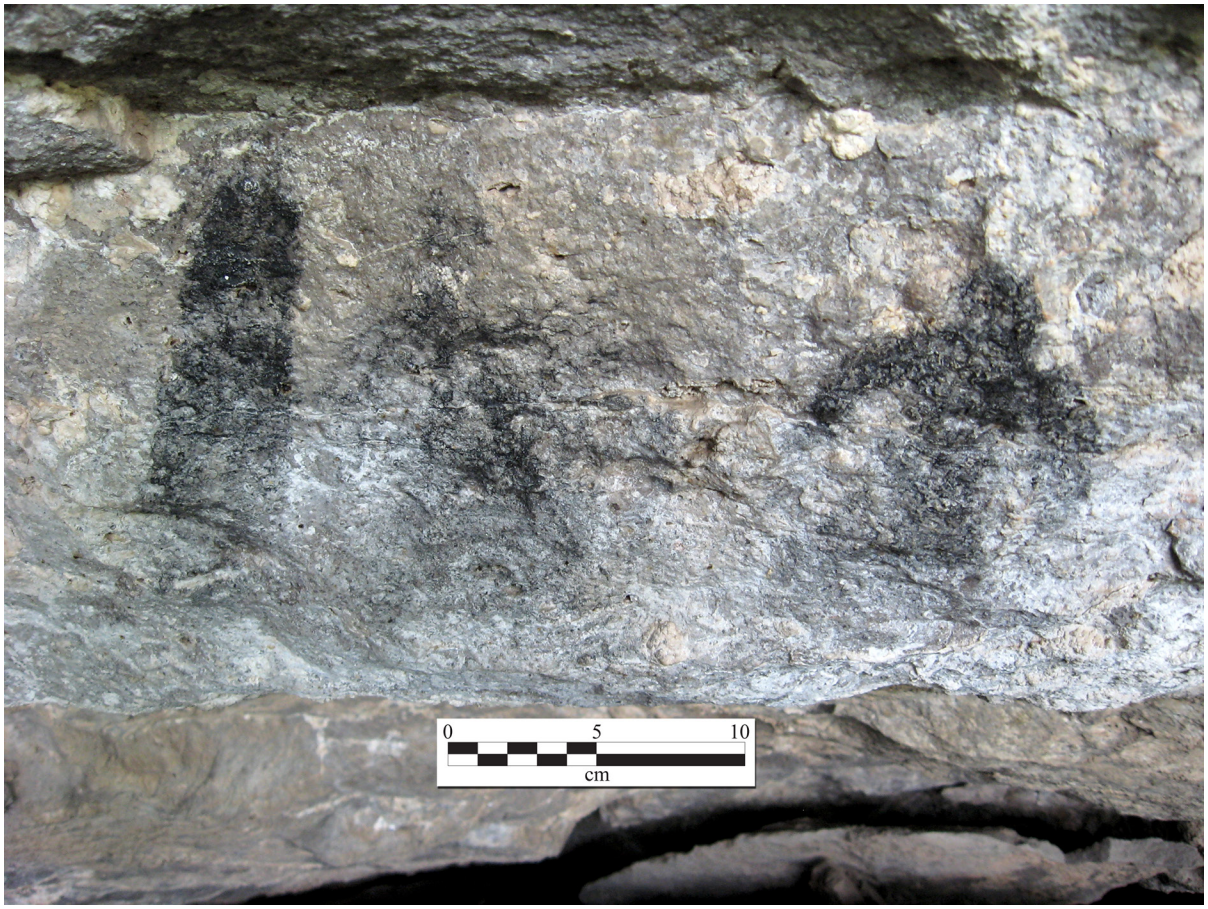

Figure 17. Design 2A-C. Photograph by the author.

Figure 18. Watercolor of design 2A-C. Painting by unidentified 2000 TAS/CBBS field school participant.

possible decorative accessories. The legs are proportional and only one foot and the head are indicated by a somewhat flattened oval shape. The figure appears to hold a small quadruped, outlined with a series of black dots, about waist high with the supposed head of the quadruped facing away. The four legs of the quadruped are indicated straight down from the body. Certain aspects of this scene, including the circular item, the necklace or chest decorations on one or both human-like figures, and the quadruped being suspended above the ground by one of the figures, may be indicative of ceremonial content.

Design 2A-E (Figure 19) is a vertical column of 10 black horizontal design elements. Four of the elements have a circular area on the left end, and the fourth item down appears to have a circular area on both ends. These circles are painted in outline only, and most include a tassel or feather-like object on their left ends. The first or topmost element in this vertical column is the best defined of the group. The second horizontal element has a triangular point on its left end. The third and the last two elements are less clearly defined. The seventh and eighth elements appear to have somewhat forked ends to the left. The four design elements with the circular ends, especially the first element in the vertical row, have an unmistakable resemblance to two rock art designs found at the Meyers Springs site.

Meyers Springs is located west of the Pecos River in Terrell County, Texas, just a few miles northeast of the small town of Dryden. Kirkland recorded the rock art there in 1935 (Newcomb and Kirkland 1967:Plates 70–79). Newcomb describes three rock art periods or episodes at the site: the first is a pictographic style closely resembling the Pecos River Style, the second period consists of pictographs similar to the Red Monochrome Style, also found in the Lower Pecos area, and the third style consists of historic pictographs. The Pecos River-like style at this site is superimposed by pictographs of the two later styles and the Red Monochrome-like style is itself superimposed by the historic pictographs, providing a relative temporal sequence for the rock art (Newcomb and Kirkland 1967:112).

Kirkland's Plate 75 (Figure 20) depicts a horizontal row of five vertical design elements very

Figure 19. Enhanced photograph of a vertical column of 10 black horizontal elements in design 2A-E. Photograph by the author.

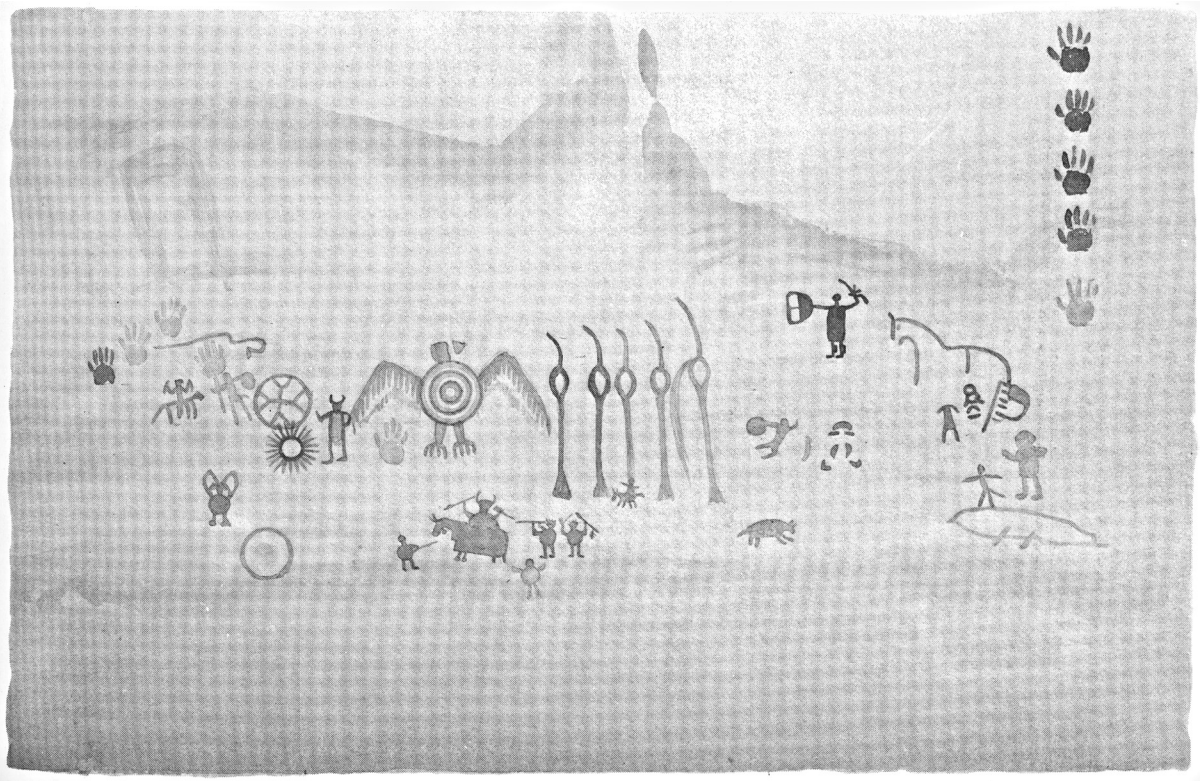

Figure 20. Rock art panel at Meyers Springs from Newcomb and Kirkland (1967:Plate 75). Courtesy of the Texas Archeological Research Laboratory, The University of Texas at Austin.

similar in form to this topmost horizontal element in 2A-E. The similarity includes a feather-like extension from the upper loops of the figures. The panel is presented in gray tones but the figures were actually painted in a purple-red color (Newcomb and Kirkland 1967:121). Plate 73, also recorded by Kirkland (Figure 21), depicts a horizontal row of red human figures holding hands. The figures appear to be involved in a dance or some type of ceremony. Each of the dancing figures has a circular head painted in outline only. Attached to their heads are feather-like appendages that curve to the right. This row of human figures holding hands resemble the round-ended figures in 2A-E, and they are somewhat similar to the figures in Kirkland's Plate 75. The pictographs on both Plate 73 and Plate 75 appear to be a combination of prehistoric and historic rock art.

Kirkland, discussing the Meyers Springs rock art, felt that "only after careful study can many of the designs be correctly assigned to their period"

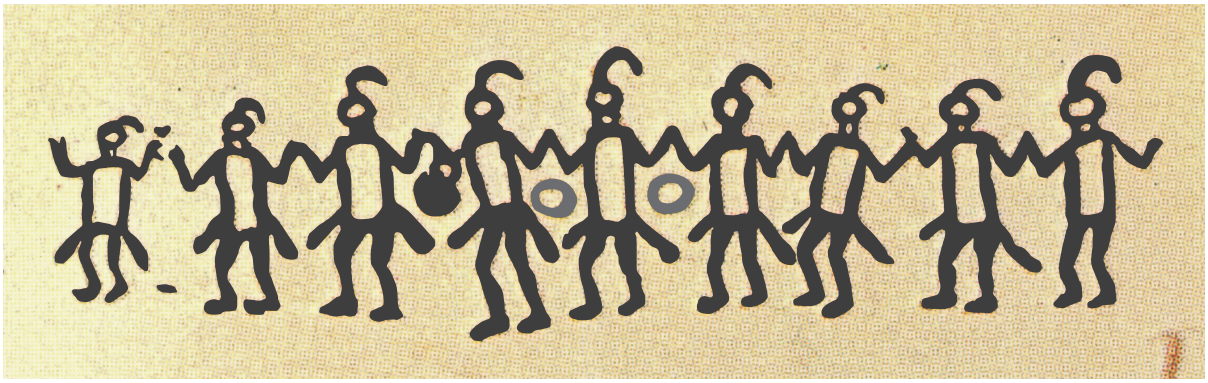

Figure 21. Detail from Meyers Springs rock art panel (Newcomb and Kirkland 1967:Plate 73). Courtesy of the Texas Archeological Research Laboratory, The University of Texas at Austin.

(Newcomb and Kirkland 1967:121). Newcomb, however, stated that the five upright elements in Plate 75 cannot be confidently assigned to any one specific period. He further noted that some of the unclassifiable rock art at Meyers Springs may be unrelated to the bulk of the imagery on the panel. Many of the design elements may have been created by other artists at other times. Newcomb does assign the hand holding figures involved in a dance or a ceremony to the Red Monochrome Style (Newcomb and Kirkland 1967:121).

Jackson (1938:152) proposed that these same five elements from Meyers Springs in Newcomb and Kirkland's (1967) Plate 75 may be conventionalized representations of atlatls or some type of gaming stick. He compared these design elements with similar imagery at a second site, his site number 64 (Figure 22), located nearby in the northwest corner of Val Verde County. Jackson (1938:165) noted "[t]he six hook-end paintings . . . are almost identical with others on the wall of an overhanging ledge at Site No. 56 [Meyers Springs], Terrell County." The figures in Jackson's Site 64 are composed of long, straight, vertical lines with an open circle at the upper end and each includes the feather-like appendage from the open circles. In this panel an atlatl or dart is pointed at the figures.

Jackson lists three main differences in the designs at these two sites: the "loops" in the Val Verde paintings are almost round, whereas those in Terrell County are elliptical in shape; the "hooks" in the Val Verde imagery are very pronounced and turn to the right, while those on the figures in Terrell County turn to the left and have a gradual curvature; and finally, the Val Verde County rock art group includes a feathered projectile, directed towards the "six hook-end paintings," not present in the Terrell County design. In addition, Jackson (1938:165-166) noted that the design elements under discussion are almost 1 m tall in Terrell County while those in Val Verde County are 20 cm tall. Interestingly, the second horizontal element in design 2A-E at San Esteban appears to be a possible projectile with a triangular point at the left end.

An additional depiction of two possible atlatls is located in a rock shelter at the mouth of a canyon on the west side of the Pecos River. Kirkland recorded the site, called Site 14, in 1938 (Newcomb and Kirkland 1967:Plate 8). The possible

Figure 22. Pictograph panel from Site 64, Val Verde County, Texas (Jackson 1938:Plate CXV). Courtesy of the Texas Archeological Research Laboratory, The University of Texas at Austin.

atlatls are oriented vertically near the center of this Pecos River Style rock art panel. These elements are located just beside the left arm of a possible anthropomorphic figure, but they are not attached to the figure. Additional rock art is superimposed on the lower extensions of the possible atlatls. Very near the top of each figure, circular or oval elements occur, and one, if not both, of these elements are bisected down the middle. These elements appear to have short hook-like appendages extending from the tops of the circles or ovals.

Jackson recorded the rock art at Tall Rock Shelter (his Site 30) in northeastern Jeff Davis County. Among the rock art recorded at the site is a design representing what Jackson called "crude conventionalized dancing figures." The 5.2 m tall "dancing figures" resemble design 2A-E at San Esteban Rockshelter, but lack the feather-like object extending from the head. Also, the Tall Rock Shelter designs (Mallouf 2001) are a horizontal row of vertical figures (Figure 23), whereas the San Esteban design is a vertical row of horizontal figures. Jackson (1938:96-101) commented that the Tall Rock Shelter designs reminded him of prehistoric pictographs found in the southern Big Bend and the lower Pecos regions.

A cultural relationship may exist between rock art designs at San Esteban shelter and Plains Biographic Style rock art (Keyser 1987; Keyser and Klassen 2001; Sundstrom 2004) as seen in San Esteban's design 2A-E and the Plains Biographic Style of groupings (or tallies) of objects thought to represent captured war trophies. These tallies usually consist of horizontal rows of a single repeated image or a combination of various images that may number from a few to several dozen. These repeated images are most often similar in size and form and they are usually presented in a vertical orientation. They are usually highly conventionalized, and they often do not exhibit great detail or elaboration, as they appear to be more representational (Keyser and Klassen 2001:236–237).

In some cases, individual elements, such as weapons, within the Plains Biographic Style have been minimized in form and abbreviated to the point that they can only be recognized in relational context to other images in the tally (Figure 24). Of the 10 elements in design 2A-E at San Esteban, the first one is the most clearly defined. The fact that the remaining nine elements are not as distinct may simply reflect a predilection to minimize and abbreviate the forms. Perhaps once the first element was defined, the artist felt no need to elaborate the additional elements beyond simple forms.

The design at San Esteban shelter, 2A-E, however, does not fit easily into the established Plains Biographic Style. In that style, weapons taken as coup are usually displayed in the rock art in horizontal rows of vertical elements, whereas weapons illustrated in a vertical column, as seen in Figure 24a-b, represent the force or forces in a battle. In addition, a tally is a written brag and it defeats the purpose of the brag if the tally is not prominently displayed (James Keyser, personal communication 2015). Design 2A-E is practically hidden at the north end of Panel 2A, and could serve more as a nervous threat than it does a brag. The only additional vertical column of horizontal lines (2A-H, discussed below) are 16 lines created in a red color and placed on the wall at the southern and more lighted end of Panel 2A, perhaps, reiterating the somewhat hidden design in 2A-E. Considering all the factors discussed above, especially Jackson's site 64 (see Figure 22), design 2A-E could represent persons with feathers extending from their heads that have been dispatched (and, therefore, presented horizontally) as painted by the artist.

Design element 2A-F consists of a solid red circle with a bar extending out to the right. Attached to this bar is a solid red triangular shape pointing to the right. The overall design looks similar to a short arrow shaft with a solid ball attached to the lower end. A curvilinear line of yellow paint is noticeable just below but separate from 2A-F. Lowrance (1988a:103) recorded this design with the red circular portion painted in outline rather than solidly painted. Both Lowrance (1988a:103) and Jackson (1938:Figure 97) recorded this design at San Esteban with a sinuous line attached, no doubt corresponding to the separate yellow curvilinear design located below 2A-F.

At a rock art site in Auras Canyon (41PS169) in southern Presidio County, Lowrance (1988b:Figure 77) recorded a design, similar to 2A-F, created with black paint. The same triangular pointed element is on the right connected by a bar that extends into an open circle on the left. The design is painted solidly except for the open circle. This design is somewhat reminiscent of an atlatl with a projectile in place. Both this design and the one at San Esteban may exemplify this weapon. An additional example of this type of projectile is found in Plains Biographic Style rock art at a site in Castle Butte, Montana (Keyser and Klassen 2001:248–249).

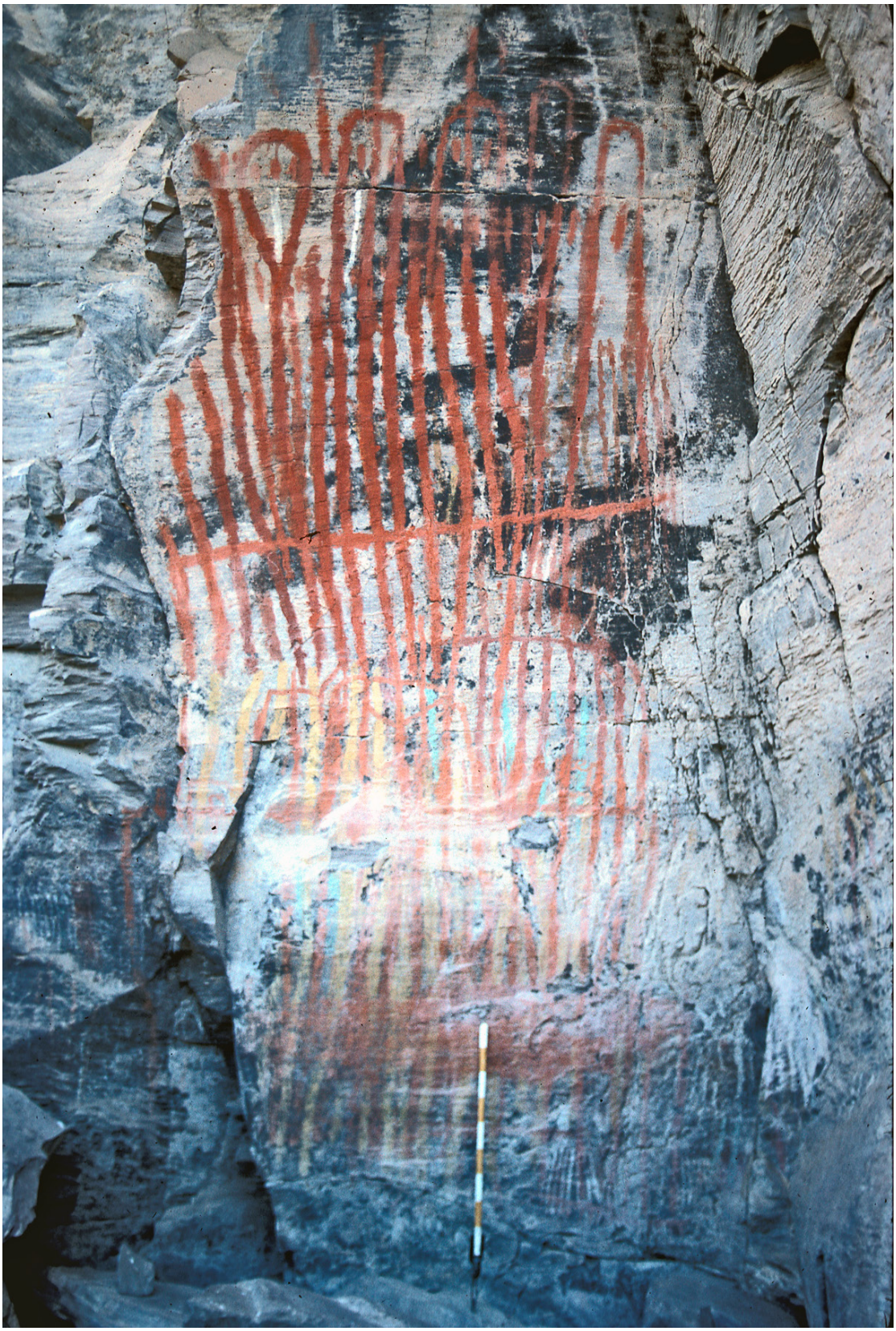

Figure 23. Seventeen-foot tall red pictograph at Tall Rockshelter, Jeff Davis County, Texas. Photograph by Robert J. Mallouf.

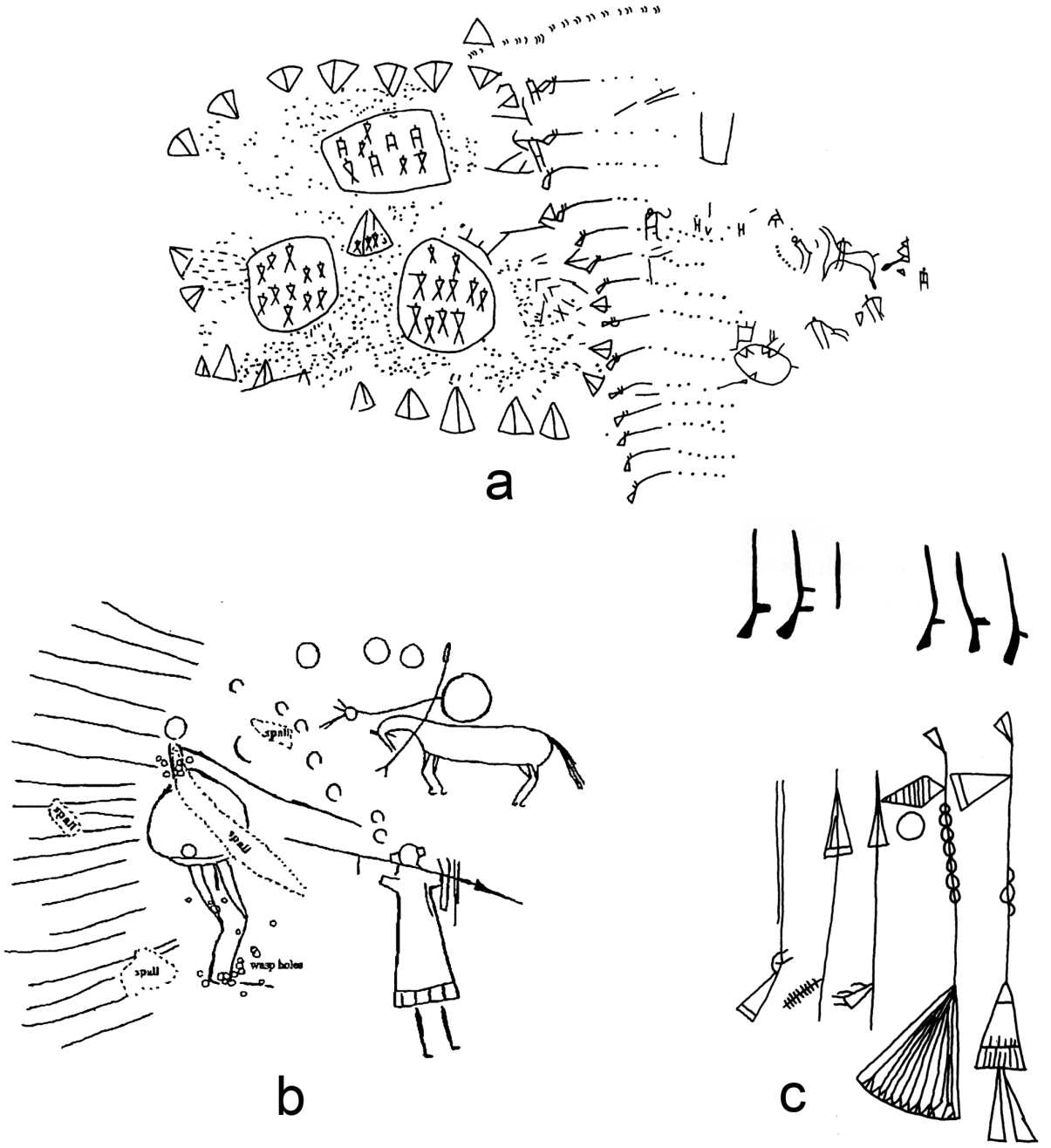

Figure 24. Images of weapons tallies in the Plains Biographic Rock Art Style: a, offensive/defensive tally imagery; b, offensive/defensive tally imagery with simplified tally marks; c, tally of weapons taken in battle or coup counts drawn in vertical orientation. Courtesy of James D. Keyser.

Another design element on Panel 2A is design 2A-G. This image consists of a red vertical sinuous line with two red dots above it. This design may represent a snake although additional details are lacking. One of the red dots is placed approximately 6 cm directly above the top of the line. The second dot is about 2 cm above and to the right.

A vertical column of 16 red horizontal lines constitute design 2A-H. The horizontal lines range in length from 8–14 cm. These two elements, 2A-G and 2A-H, are only separated by about 20 cm. Kirkland recorded both of these designs and included them in one figure (Newcomb and Kirkland 1967:Plate 86, No. 13).

On the ceiling above Panel 2A is the location of a yellow colored arrow design designated here as 2A-I. Either this design, 2A-I, or the yellow arrow in design 3-D below must be the "rude arrow" mentioned by Peabody (1909:215) when he visited San Esteban Rockshelter. The most that can be confidently stated about design 2A-I is that it appears to represent an arrow-shaped design.

Panel 3. Four of the rock art designs on this panel, 3-A, 3-B, 3-C, and 3-G consist primarily of horizontal rows of vertical red or black tally marks. Design element 3-C is exceptional in this category due to the large number of tally marks (n=51) involved in the design (Figure 25). Two of the check marks in the row in 3-C are more like broad smudges. These may have originally consisted of one or more tally marks or some other design element altogether.

The arrow depiction in design 3-D is painted yellow (see Figure 25). The design consists of a vertical line representing the arrow shaft and two vertically angled and downward pointing barbs. The barb on the right side is about twice as long as the one on the left. Each barb has two evenly-spaced red paint marks perpendicular to and overlying the yellow color, and the stem has one red perpendicular line about half way down its length. To the left of the arrow design, random-appearing marks and lines have been painted in both red and yellow.

Lowrance (1986:Plates 7 and 26) recorded two additional instances of very similar arrow shapes in the region. The first was at the Red Bluff site in south-central Brewster County, Texas, while the other was recorded just across the international border in Mexico, presumably in Chihuahua. The Red Bluff design consists of a vertical central shaft with an approximate 45° angle to the left about half way down its length, and two equal and angled vertical barbs that extend to just below the angle in the central shaft; the color of the arrow shape is not indicated. A design resembling a downward-pointing arrow or a half-diamond shape is superimposed on the right barb. A small diamond is centered within this superimposed area. It is not clear if the superimposed element is painted on the barb in a lighter

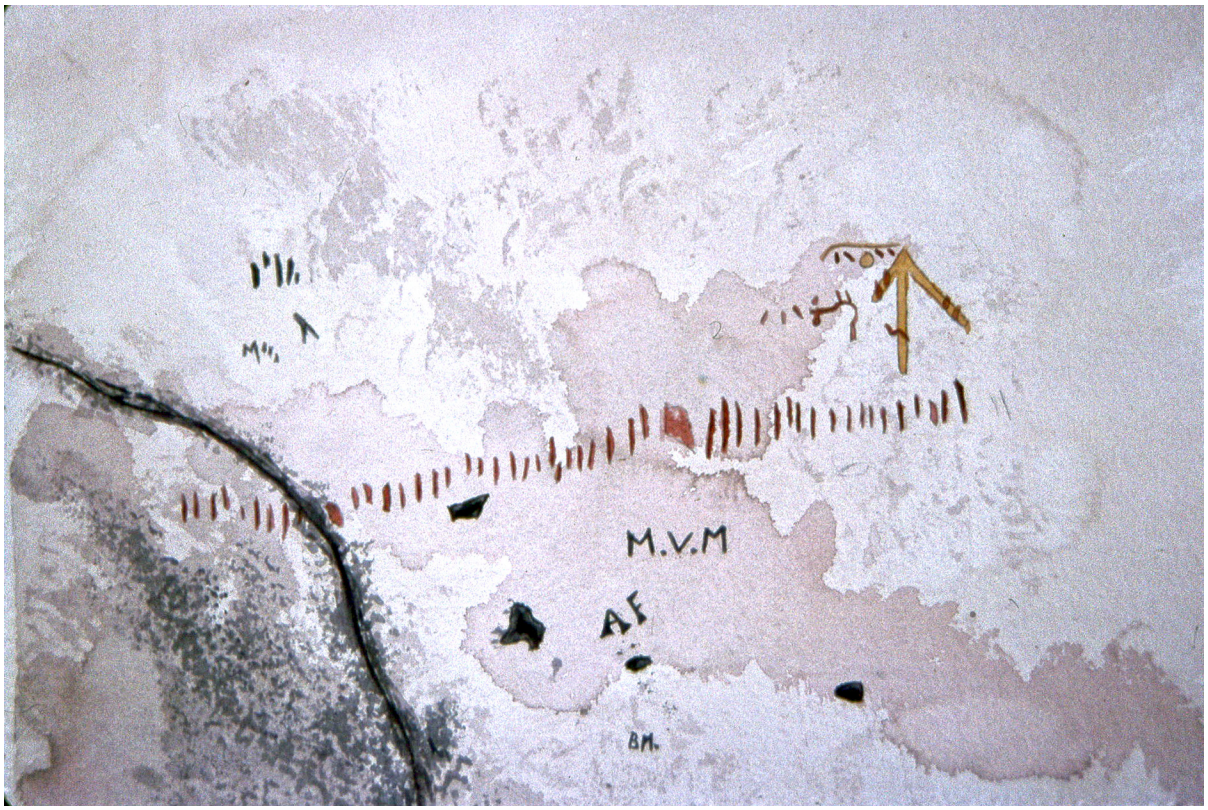

Figure 25. Watercolor reproduction of a horizontal row of vertical tally marks, a yellow arrow, and historic initials at San Esteban Rock shelter. Painting by unidentified 2000 TAS/CBBS field school participant.

color or perhaps was scratched onto the surface. The second example, from Mexico, is also very like the San Esteban design. It, too, has a vertical central shaft with equal and angled vertical barbs. This design is painted in a white color.

Below the row of tally marks in design 3-C are three sets of historic initials that are combined as design 3-E (see Figure 25). Two sets of initials in black paint are: M. V. M and A F. The third set of initials, B M., are rendered in lead pencil. Several small spots of red paint and indiscernible pencil marks intermingle in the general area around the initials.

A particularly intriguing pictograph (3-F) at the San Esteban shelter involves a group of quadrupeds. The quadruped group consists of nine individual elements outlined in red and two smaller solid black ones. Jackson (1938:103) recorded seven red quadrupeds representing this design. Lowrance (1988a:100-104) noted in her text that there were nine quadrupeds in the scene, but she recorded 10 quadrupeds in her drawing. Neither Jackson nor Lowrance recorded the two smaller solid black quadrupeds that may represent dogs. Kirkland (Newcomb and Kirkland 1967:Plate 86, No. 1) recorded nine red-outlined quadrupeds and two smaller solid black quadrupeds. It should be remembered that Charles Peabody's verbal description of the San Esteban rock art included, "nine horned animals pointing the same way" (Peabody 1909:215).

All of these red quadrupeds have the appearance of cattle (Figures 26 and 27). They are outlined in red paint rather than being painted solidly. The outlines of the bodies are simple boat shapes with the heads suggested by the horns and a slight narrowing of the bodies near the head area. Most of these quadrupeds have long hanging tails and they all have longish horns directed upward. Ears are not present. Seven of the larger red animals have four legs indicated by simple straight lines, but two have only three visible legs. Cloven hooves are implied on four of the red creatures using inverted V-shapes at the lower ends of some of their legs. In contrast, rock art depictions of bison often indicate a hump-backed creature with a short, raised tail or with the tail raised somewhat over the animal's back. Bison depictions also usually display short horns that often curve outward initially and then inward at the upper tips.

Other depictions of quadrupeds thought to be cattle are found elsewhere in Presidio County. A painted design with the appearance of a longhorn cow has been noted in Auras Canyon in Big Bend Ranch State Park (Andy Cloud, personal communication 2008). Lowrance (1988b:Figures 62 and 64) also recorded figures that appear to be cattle with various horn configurations in the same Auras Canyon area.

This group of quadrupeds at San Esteban is located around a natural depression on the rough rock shelter wall, and all of them are facing to the left as though they were moving as a unit or a herd. The five red animals to the rear are rendered on a horizontal plane, whereas the four lead animals differ in that some are angled somewhat downward and the lead animal is angled slightly upward. This gives the group, or the herd, the impression of movement, as though it were traversing a rough, undulating terrain. In addition, each of the nine red quadrupeds is represented in varying degrees of size and shape, creating the impression that members of the herd are spread across the terrain, some near and some more distant, as would be expected with a herd of live animals.

The two small solid black quadrupeds, that may represent dogs or canids, are also posed at slight angles to the horizontal, also indicating an undulating terrain. One of these black quadrupeds is located in front of the larger red quadrupeds, and the other is located behind the group; both are in positions where one may expect to find herding dogs.

Quadrupeds believed to be dogs, like these two at San Esteban, have been recorded in hunting scenes of the Early Hunting Style petroglyphs of the northwest Plains. These quadrupeds have been "tentatively dated by AMS radiocarbon calibration from about 4000 to 5000 B.C." (Keyser and Klassen 2001:84–85). Dogs are also present in the Plains Biographic Style rock art that flourished from the early 1700s to the late 1800s (Keyser and Klassen 2001:224, 232).

Various Apache and Comanche groups are repeatedly documented in historic times as using dogs as beasts of burden. For transport, two long poles were tied to dogs in the fashion of a travois and loaded with items that the native peoples wished to carry with them (Kessell 1979:22, 127, 134-135, 371). Ample evidence exists to support the existence of a widely diverse array of dogs in the Americas prior to European contact and dogs probably accompanied many of the early groups of people when they migrated to the Americas (Allen 1920; Schwartz 1997). Some livestock-herding dogs are believed to have derived from the "continuously domesticated descendants" of the Conquest period attack dogs of Spaniards (Jordan 1993:82).

Both of the smaller black quadrupeds in design 3-F face the same direction as the larger red creatures. Whether of significance or not, the

Figure 26. Enhanced photograph of nine quadrupeds, two canids, and a human figure (design 3-F). Photograph by the author.

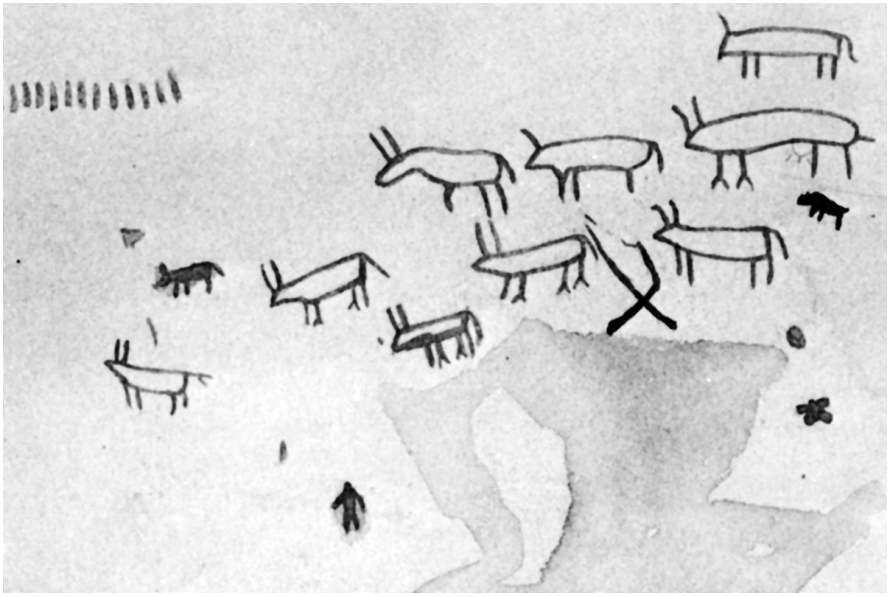

Figure 27. Kirkland's watercolor of design 3-F. Detail from Newcomb and Kirkland (1967:Plate 86, No. 1). Courtesy of the Texas Archeological Research Laboratory, The University of Texas at Austin.

physical direction all of these quadrupeds are facing is actually toward an exit from the shelter that leads to the waterhole beyond.

Interspersed amongst the red cattle and two smaller black quadrupeds is a black "lazy X" design. The two small black quadrupeds and the "lazy X" are no longer discernible on the actual rock art panel (see Figure 26), and are included here based upon Kirkland's 1939 rendering (Newcomb and Kirkland 1967:Plate 86) (see Figure 25). Just above the back of one of the quadrupeds the initials V. M., with some indiscernible scribbles following and near these initials, is the date 1861, all created in a black color. Although most of the design elements in 3-F are highly faded, it is not evident that they have been treated with a preservative as have many of the other designs at the shelter.

Only a few of the horned quadrupeds stand out clearly on the rock art panel today (see Figure 26). As stated, many of them are faded almost beyond recognition, but most can be located based upon previous recordations. Significantly, a few of the quadrupeds still have a very dark red outline, and it appears as though some of the design elements on this panel may have been refreshed, at least partially, at some point in time.

A few centimeters below the group of quadrupeds, there is a human-like figure painted solidly in a red color. The figure is indicated in profile with a rounded head and simple straight lines for arms and legs. Hands and feet are not present. The position of arms, one in front and one in the back, seem to imply a walking motion. This figure is facing in the same direction as the herd of quadrupeds above it. The human-like figure may have been created as a part of the overall scene of the herd of quadrupeds. The dark red color of this human-like figure seems to be identical to the dark red outlines mentioned above on a few of the quadrupeds. If these horned quadrupeds are indeed cattle as opposed to bison, they are, of course, descended from cattle imported by the Spanish.

The first herds of Spanish cattle to reach the mainland of the New World arrived at Tampico on the Panuco River in 1521. These cattle were followed the next year by several herds that went to Veracruz (Rouse 1977:ix, 3, 44-45 and Map 4; Jordan 1993:Figure 17). Rouse (1977:46, 54) notes, further, that by 1539 wild cattle had reached as far north as the future border area between the United States and Mexico. Domesticated Spanish cattle entered Texas through Eagle Pass in 1717. Herds of Spanish cattle, horses, mules, sheep, and goats increased so rapidly that they often strayed and became wild, evolving into large herds.

In 1540, the expedition of Francisco Vásquez de Coronado traveled north from Compostela on Mexico's west coast and eventually arrived in present day Arizona, and then continued on through New Mexico, Texas, and into Kansas. Coronado's army was outfitted with considerable livestock, including several thousand head of horses, mules, sheep, goats, hogs, and a large number of cattle (Bolton 1990 [1949]:56, 149). These large herds of livestock would have been a significant spectacle for any native population to have witnessed, and news of the vast herd, along with the Spaniards and their many indigenous followers, would have spread far and wide, eventually as far east as settlements at La Junta de los Ríos.

By 1583, if not earlier, Spaniards from Santa Barbara, Chihuahua (the San Bartolome Valley) had penetrated north to the La Junta de los Rios area on slave-raiding expeditions seeking workers for their mines and haciendas. According to Griffen (1979:48), "Conchos and…natives from the La Junta area were used intensively on the haciendas, and they continued to be regarded as an important source of agricultural labor throughout the 17th and into the 18th century." As early as 1604, eight Spanish cattle ranches were noted in the area of Santa Barbara (Griffen 1979:44, 108). A census taken at La Junta de los Ríos by Trasvina Retis in 1715 indicated that 80 native persons were away working in the San Bartolome Valley. At the same time Captain Joseph Miguelena conducted a partial count of La Juntans working on specific haciendas in San Bartolome and counted 174 persons excluding their wives and children (Griffen 1979:49). This work on the Spanish haciendas in the San Bartolome Valley may represent the earliest exposure of the La Juntans to cattle.

The Governor of New Spain, Juan de Onate, established the first permanent settlement north of the Río Grande at San Juan de los Cabelleros north of Santa Fe, New Mexico near the Colorado border, in 1598. Onate's expedition also established the first authenticated herd of breeding cattle north of the Río Grande. The exact size of this herd is not known, but is believed to have ranged between 4000 and 7000 animals (Rouse 1977:79–80). Onate's group bypassed the La Junta de los Ríos settlements by taking a direct route across northern Chihuahua and striking the Río Grande just south and east of El Paso (Riley 1987:25). There can be little doubt,

however, that the La Juntans were fully aware of the expedition that included these vast herds of cattle and other livestock.

In 1716, five Franciscan missions were established by the Spanish near La Junta de los Ríos. Cattle, sheep, and agricultural tools were provided with the missions. The care of the cattle, along with supervision of the churches, was placed in the hands of Francisco, the Indian governor. Francisco was a devoted Christian who had worked seasonally at the haciendas of San Bartolome. It is apparent, then, that some of the natives living in the La Junta de los Ríos area had gained practical experience with cattle prior to 1716 and more so after the missions were established. The missions were abandoned after about two years due to conflicts between La Junta natives and non-Christian natives over possession of the cattle (Kelley 1986:63). Horses, of course, had an incredible impact upon native populations, and depictions of horses in rock art are quite extensive. Rock art images of cattle, on the other hand, are not nearly as common or as widespread.

Keyser (1987:44-45), discussing Late Prehistoric Plains Indian Ceremonial Style rock art, believes that this art style was created between A. D. 1000 to 1700. Motifs characteristic of this style included various boat-shaped zoomorphs and items of material culture among other elements. The Ceremonial Style displayed a rigidity of form which did not initially involve a sense of action or motion. This was a symbolic art denoting individualistic meanings and was probably of a purely ceremonial nature.

During the Protohistoric period (ca. A. D. 1625–1775), a change occurred in the Ceremonial Style rock art, and it began to include motion or action scenes. The boat-shaped zoomorphs and most of the previous motifs of the Ceremonial Style, however, remained constant (Keyser 1987:45). Of interest here is that the nine red quadrupeds (3-F) at the San Esteban rock shelter exhibit boat-shaped bodies and the scene does appear to involve action and motion.

After about A. D. 1775, a new art style which would be called the Plains Biographic Style, as discussed earlier, arrived on the Northern Plains. Many of the same motifs utilized in the older Ceremonial Style persisted. Zoomorphs of this style consisted primarily of horses but also sometimes included bear, deer, or elk and bison. The new Plains Biographic Style imparted a realism absent in previous Plains Indian art styles. This new artistic style produced a form of picture writing that enabled the viewer to gain an understanding of the events depicted in the art (Keyser 1987:48; Sundstrom 2004:106).

Exposure of native peoples to Euro-American artists traveling among them had an influence on native art styles. Possibly due to this exposure, between 1830 and 1850 the Biographic Style began to be expressed as an even more realistic art. This Late Biographic Style is characterized by rounder, more full-bodied, and sleeker horses. Zoomorphs were drawn more realistically, with much more detail, such as horse tack and individual weapons. Personal names (in the form of a name glyph), were sometimes added to the scenes (Keyser 1987:48-50; Keyser and Klassen 2001:231). Biographic rock art sites are distributed widely, ranging from Calgary, Alberta, in the north, south as far as Texas and northern Mexico, and from the Columbia Plateau and Colorado Plateau to Kansas (Keyser and Klassen 2001:242).

The Hussie Miers site (41VV327) is located on a tributary of the Devil's River in southwest Texas, a short distance north of the Río Grande. Four rock art sites are located here in an area overlooking a permanent pool of water. The majority of the rock art is attributed to the Red Monochrome Style of the Late Prehistoric period (ca. A.D. 600–1600) (Turpin 1989a:105). Set apart on one portion of one of the rock art panels are five separate scenes apparently chronicling the adventures of a single warrior. In all five of the scenes, a warrior with a long unique hair style is found in combat with various individuals. Two of the scenes show a warrior on foot in combat with persons brandishing either a bow or a spear. The other three scenes depict the warrior on horseback confronting apparent Euro-Americans, each holding a firearm and wearing some type of helmet. Above the warrior's head in each of the scenes, a long ornamented spear is suspended in midair as though it may be representative of a name glyph. Turpin (1989a:106) suggests that the helmets worn by the Euro-Americans appear to be of a Prussian-influenced uniform type. This uniform style was adopted in 1871, and if the supposition is correct, the uniform style dates the rock art to some point in time after 1871.

Parsons (1987) discusses a petroglyph site in northwest Texas known as the Mujares Creek site. The site is located on a southern branch of the Canadian River in Oldham County, Texas. Among the designs depicted in the Mujares Creek petroglyphs

are bipedal humans (often in pairs), horses (some with riders), quadrupeds with horns that are often lyre-shaped (presumably cattle, possibly longhorns [Newcomb and Kirkland 1967:208]), and historic weapons such as flintlock rifles. Many of these supposed cattle are shown with inverted V-shapes representing split hooves (Parsons 1987:Figures 2-3). As is the case with some of the quadrupeds painted at San Esteban shelter, horse's hooves are sometimes depicted as hooked or C-shaped elements in an apparent effort to indicate the shape of the horse's hooves and tracks (Turpin 1989a:Figure 2).

As stated, Plains Biographic rock art often recounts and displays the accomplishments of individual warriors. The most significant way for Plains warriors to gain status was to count coup on an adversary by touching him with a bow, a stick, or a hand. It was of little importance whether the adversary was wounded, dead, or unharmed, although the distinction achieved probably varied. Counting coup on an enemy was considered to be more courageous than taking the person's life. The next best way to achieve distinction as a highly regarded warrior was by taking a horse or horses from any foe (Sundstrom 2004:99). Parsons (1987:267) believes that many depictions of horses and cattle in the Mujares Creek petroglyphs represent animals stolen from Euro-Americans or other native groups. The scene of the supposed cattle possibly accompanied by a hatless human-like figure and two dogs at San Esteban shelter (3-F) could be a scene depicting such a coup.

Counting coup was a significant achievement in the life of a warrior. The depictions of such acts, in the form of rock art, were meant to be seen by other members of the warrior's group. This may explain why these images were often located near heavily traveled trails and other similar locations. The sites were probably visited often, not only to recall and share the coup events with others, but also to add new coup counting accomplishments (Parsons 1987:272). San Esteban Rockshelter, a sheltered location on a highly traveled route with a permanent source of water, is just such a place.

There is a possibility that design 3-F is simply a depiction of a herd of cattle being driven along the Chihuahua Trail. Several factors, however, suggest that this is unlikely. As mentioned above, cattle, as opposed to the horse, are not abundantly represented in the rock art of most native cultures. It may be, then, that cattle were not extremely important to these cultures other than as an immediate source of food and hide just as were rabbits, deer, antelope, and bison. Although sometimes serving as a food source, the horse dramatically altered the lives of native peoples and is, therefore, seen more often in their rock art.

Design 3-F is created in a red color as is much of the rock art found at San Esteban. The process of making the red pigment often used in the pictographs of native groups involves the grinding of a natural mineral into a powder and then adding a bonding agent such as blood or fat to the mixture. This is a deliberate process most likely not undertaken without considerable forethought and some urgency to create a particular image on the rock face.

It is not probable that a native artist would paint nine quadrupeds on the wall of a rock shelter simply as a representation of a common animal or food source. It is also unlikely to think that a non-native artist would invest time and effort to paint a scene with which he was very familiar. The human-like figure, who seems to be accompanying or herding the group of cattle in design 3-F, is not wearing a broad-brimmed hat nor is there a horse in the scene. These factors suggest that the creator of this pictograph was probably a native person. In regard to the impetus behind the creation of this scene, it would seem most likely that the cattle may have represented some of the first cattle observed by the artist or perhaps the scene represents a coup of stolen cattle.

Panel 4. Most of the rock imagery on this small panel is either very faded or smeared into splotches. Several figures, however, are fortunately still visible. Design 4-A consists of a vertical series of four red horizontal elements that are reminiscent of design 2A-E on panel 2A. The designs in 4-A are barely distinguishable, but it appears the horizontal elements formerly involved looped or oval shapes on some of their ends.

A sinuous line in red paint or crayon (4-B) approximately 3 cm wide and 13 cm in length is barely visible on the wall below design 4-A. Design 4-C consists of a vertical column of five faded red horizontal lines. Just below these lines is a mass of very faded red paint that appears to have originally been additional lines in the same series that have since been smeared.

Design element 4-D (Figure 28) is a human-like figure with arms, legs, and a head visible on a rectangular-shaped body. This figure is viewed in a frontal position and is painted in outline form in red. An item resembling a weapon, a rattle, or

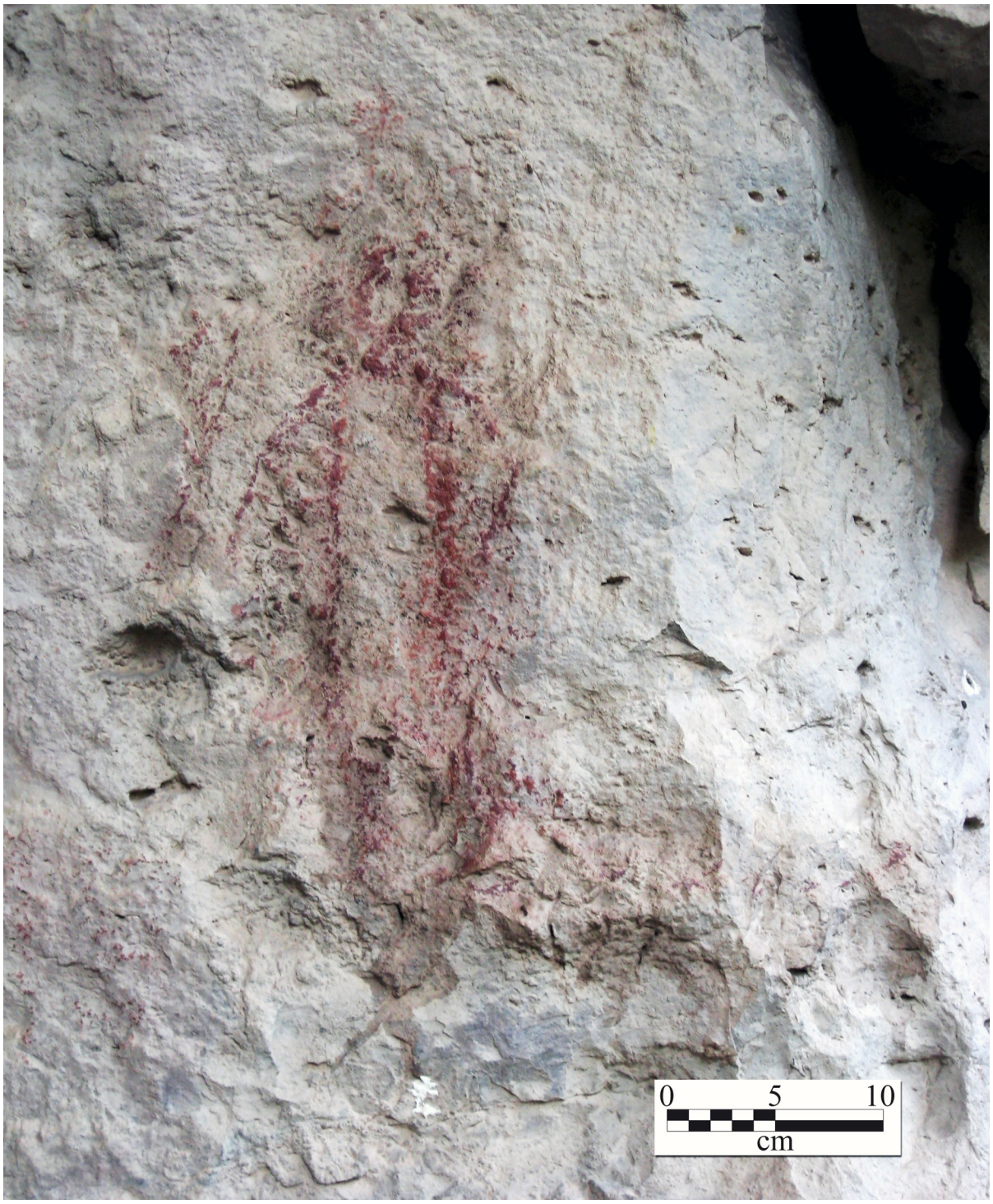

Figure 28. Enhanced photograph of smeared pictograph of human-like figure in design 4-D. Photograph by the author.

a staff-like object is suspended to the right of the figure's right arm, but unattached to the figure. The body of this weapon-like object is somewhat similar to an inverted triangle. A short straight line projects from the top of the object and a long handle projects from the bottom. There is a smear of red paint just above the figure's head. Just to the right of the figure's left foot are six red dashes or dots in a line as if trailing after the figure.

Both Kirkland (Newcomb and Kirkland 1967:Plate 86, No. 2) (Figure 29) and Lowrance (1988a:Figure 75) recorded two projections from the top of the figure's head, as though the figure was wearing a horned headdress. Those projections are not visible on the panel today as the head area is somewhat smeared. Kirkland recorded the weapon, the rattle, or staff-like object as described above, but Lowrance recorded it as an incomplete hourglass-like object that included a single, short projection from the top. Both Kirkland and Lowrance recorded dashes or dots trailing after the figure, but Lowrance (1988a:100 and Figure 75) placed them more in the position of a tail on the figure, and she described this figure as "a horned devil-like figure" (Figure 30).

While this design does not initially appear to conform to the Plains Biographic Style rock art, certain characteristics in the design are suggestive of that style. In describing the style, Keyser and Klassen (2001:236) state that: "Biographic rock art includes two main types of compositions: static groupings (or tallies) of objects, animals, and humans and animated scenes depicting humans, animals, and objects involved in activities." The Plains Biographic Style tallies have been discussed previously, but design 4-D does not appear to be a tally. And the design does not seem to be an animated scene except for the line of dashes or dots to the right of the figure.

In the Plains Biographic Style, there are often found "nonrepresentational or abstract designs that symbolize real objects or actions," such as a series of short dashes representing footprints, or a series of C shapes that represent horse tracks (Keyser and Klassen 2001:235). Similarly, a series of dots extending from the end of a gun barrel represent the path of a bullet (Keyser and Klassen 2001:238). The use of a line of dashes or dots is very much a part of Plains Biographic Style rock art, and it may be present in figure 4-D at San Esteban, perhaps representing tracks.

Figure 29. Reproduction from Kirkland's watercolor of design 4-D (Newcomb and Kirkland 1967:Plate 86, No. 2). Courtesy of the Texas Archeological Research Laboratory, The University of Texas at Austin. Drafted by Leticia Wetterauer.

Figure 30. Design 4-D as recorded by Lowrance (1988a:Figure 75). Courtesy of the El Paso Archeological Society.

An additional aspect of Plains Biographic Style is that non-representational elements are usually associated with other objects that are representational. In the case of design 4-D, the representational element would be the weapon, rattle, or staff-like object suspended to the left of the figure. Considering that this object is not in the hand of the figure or touching the figure, but is clearly associated with the figure, it must be in some way representative and related to the figure. In the tradition of Plains Biographic Style rock art, the row of dashes or dots imply movement of the figure in the direction of this object. The suspended object could actually represent a war trophy, or at least an object obtained through warfare. A design element quite similar to this object was recorded at Bee Cave Canyon in central Brewster County, Texas by Lowrance (1982a:Plate XXII).

This suspended object could also be a status symbol or symbol of authority akin to a scepter. Rock art in the Biographic tradition "was primarily used to record a warrior's personal accomplishments and important life events—accomplishments that heightened the warrior's status and honor. Thus, rock art was used to advertise the individual's standing in society and the world" (Keyser and Klassen 2001:244). Schaafsma (1980:312) has noted that in some Gobernador Representational Style rock art a figure's direction of travel or direction of movement is sometimes indicated by adding the calf muscle and feet to the figure. It is interesting to note this same technique as it is utilized in Plains Biographic Style rock art. The same technique may be in effect with design 4-D and could indicate motion in the direction of the suspended weapon-like object and would correspond with the dashes or dots as tracks of the figure as it approached the object.

The Gobernador Representational Style rock art found in northern New Mexico is a "distinctly Navajo creation" that "is similar in both style and content to that of the contemporary Pueblos and is thus a further manifestation of the Jornada-Rio Grande art tradition and its associated ideology" (Schaafsma 1980:306–307). In addition, elements of Plains culture, such as apparent feather headdresses, are present in Gobernador Representational Style rock art, thus reflecting the Athapaskan background of these Navajo artists. The seeming horned headdress of design 4-D, as depicted by Kirkland and Lowrance, may be a further indication of a Plains influence. However, horned beings are also present in Gobernador Representational Style petroglyphs and are considered to be of Puebloan influence (Schaafsma 1980:307).

One last item of discussion concerning design 4-D in relation to Plains rock art is the smudged area of red color located directly above, but seemingly separate from, the head of 4-D. There is a possibility that this smudged area was originally a glyph that represented this figure's name. In the Biographic Ledger Art Style, name glyphs in the form of ideographs were sometimes drawn or painted above a figure and were often connected to the figure by a line. Keyser (1987:66) states that this treatment has not been definitely recognized in rock art. However, Turpin's depiction of rock art at the Hussie Miers site, as mentioned above, suggests that name glyphs may be represented there, although minus the line that physically connects the name glyph to the individual (Turpin 1989a:106). The remaining rock art on Panel 4 consists of indiscernible red smears and faint red lines.

Panel 5. Unfortunately, this panel, too, has been reduced to red splotches and smears over most of its surface. Near the top of the panel a red horizontal bar approximately 20 cm in length and 2 cm wide can still be recognized. Seemingly attached to this bar at the right end is another shorter, narrower, bar in yellow paint attached at about a 45º angle. These two bars appear to be connected physically and are designated as design 5-A.

Directly below design 5-A, at ground level, an arch shape (5-B) consisting of two lines can be discerned. The upper arched line is painted in a pinkish-red color and the lower and shorter arch is painted in black. These two lines appear to almost touch, but do not blend into one another.

Also on this panel are a set of initials that read either R.B.M. or B.B.M. A probable date, "68," is painted just below these initials. Both the initials and the possible date (5-C) are painted in black.

Isolated Boulders

In addition to the wall panels, several boulders spread around the rock shelter have had designs painted on them. Boulder A has a pictographic design, B-A, of an apparent pronghorn antelope (*Antilocapra americana*) painted in a red color. The design is well executed and there is no doubt it is an antelope. The head with horns and one ear,

a neck, wide front legs, and chest are most evident. Two black smudges behind the neck and chest may have originally constituted the remainder of the antelope's body.

Boulders B, C, D, F, H, and I have only non-descript smears or random marks of red or black paint. Some of the marks appear to have been made with a piece of charcoal or a burnt stick. A few of the designs may include letters of the English alphabet. Other designs appear to be prehistoric. Apparently all of the boulder designs have been coated with a preservative.

Boulder E has a design of a globular human-like figure. This design greatly resembles the two human-like figures in design 2A-C on Panel 2A (see Figures 17 and 18). The figure is globular and rounded at the bottom with no legs or feet. The arms are upraised, but hands are not present. The head is a simple rounded shape. This figure is painted solidly in a red color. A red dot is present at the lower left of the figure.

Boulder G contains two sets of black designs. Design B-G1 is an object approximately 25 cm long and 3 cm wide. Both ends of the design are circular or oval and connected by a straight line. The centers of these circular areas are unpainted. There is an indication that the center area along the connecting line may have originally had a circular design as well, but it is now indistinct. The second design on the boulder, B-G2, consists of a black upside down "U" shape with a short "foot" directed inward on the right arm of the "U" shape. The right side of the "U" shape is longer than the left side. At the left side of the "U" shape are two black sinuous lines.

Summary

The descriptions of the rock art at San Esteban Rockshelter should serve to illustrate the wide variety of images that have been painted and carved upon the walls and boulders at the site. In addition, an attempt has been made to suggest possible cultural influences and shared styles that may be evident in some of the images. The discussion of possible cultures of influence has ranged, geographically, from northern Mexico to the Plains and from New Mexico to North Central Texas and beyond.

Horizontal and vertical rows of painted tally marks are the most abundant rock art to be found at San Esteban. The use of tally or check marks was especially concentrated in the rock art tradition of the Columbia Plateau (ca. A.D. 250–1700), and it has been demonstrated that the use of tally marks by native peoples was a fairly common practice during the Spanish Colonial period (ca. A.D. 1580–1880) in northern Mexico. The Plains Biographic rock art tradition (ca. 18th–19th centuries) also utilized a type of tally system whereby "coup counts" or weapons taken in battle were tallied. This tradition may have been transferred from the Columbia Plateau by Athapaskan groups as they drifted southward. The sets of tally marks at San Esteban shelter, and elsewhere in the area, may have served variously as types of representational markers, communicative tools, and counting devices.

Several examples of anthropomorphic and/or human-like figures exist at San Esteban Rockshelter. These figures are all red or black monochrome pictographs and most of them are painted solidly as opposed to a mere outline. Three of these figures, however, are painted in outline form with the central body area void. Design 4-D is one of the anthropomorphic figures painted in outline form (see Figures 28-30). As discussed earlier, this figure has characteristics similar to Plains Biographic rock art (ca. 18th and 19th centuries) while also seeming to have been influenced by the Gobernador Representational (ca. 18th century) rock art style. These characteristics include the possible horned headdress and the iconic item suspended beside the figure. The row of dots or dashes trailing off to the right of the figure may represent the figure's footprints and may indicate the direction of travel.

The design, 1-C, of two human-like figures wearing broad brimmed hats (see Figure 7) may involve an attempt to illustrate one or both of the figures on horseback. Many examples of human-like figures on apparent horses exist in rock art found throughout the eastern Trans-Pecos (see Figure 9). Horses and broad-brimmed hats arrived in northern Mexico with the Spanish in the latter part of the 16th century.

Along these same lines, the herd of nine red quadrupeds, two possible black canids, and a human-like figure in design 3-F most likely represent a herd of cattle with two herd dogs and a human herdsman. Dogs were apparently domesticated by native groups beginning in the Early Archaic (ca. 8000–4500 B.C.) (Keyser and Klassen 2001), if not much earlier. Seventeen different types of dogs were

documented living among native groups in America at the time of contact between the Eastern and Western hemispheres (Allen 1920; Schwartz 1997).

Cattle, however, arrived with the Spanish. The first wild cattle reached the future Texas-Mexico border as early as 1539. Breeding herds of cattle were brought to northern New Mexico in 1598 with Onate. Domesticated cattle first entered Texas from Coahuila, Mexico, at Eagle Pass, Texas in 1717 (Jordan 1993; Rouse 1977). It has been noted that cattle and sheep were provided to the missions at La Junta de los Ríos when the missions were established in 1716. It is also evident that some local native people at that time had previous experience working with these animals on the haciendas in the valley of San Bartolome in Chihuahua, Mexico. The herd of cattle depicted at San Esteban Rockshelter was created at some point after the mid-1500s and perhaps much later in time.

The two human-like figures in design 1-H and 1-J are very similar to the two figures in design 1-C with the notable absence of broad brimmed hats. Design 1-H does appear to have some sort of unrecognizable object above or upon its head and the arms hang downward at the figure's sides. Recognizable hands are not indicated. The smaller figure to the right of design 1-J reflects a human-like appearance with the body, legs, and head with arms outspread to the sides and bent upwards at the elbow.

The last three human-like figures in the rock shelter appear to be much older. Two of the black globular-bodied figures stand beside a vertical, black columnar object (2A-C). This object appears to be emitting something akin to spray, represented by small black dots, from its upper surface (see Figure 18). These two figures have heads and arms hanging down at the sides. No additional features are present. These two figures appear to be in motion towards the column. An additional red globular-bodied human-like figure, B-E, is painted onto the black surface of an isolated boulder. This figure has a head and two arms held out to the sides and bent slightly upwards at the elbows. No other features are present on the figure.

The red hourglass-shaped anthropomorph (1-M) is designated as such due to the attachments on each of the figure's arms near the elbow. Items attached to the arms of shamanic figures may represent the shaman's animal helpers (Boyd 2003:55, 60; Newcomb and Kirkland 1967:44–49). The figure's arms are held out to the sides and bent slightly upwards at the elbows. These arm attachments are noted in other regional rock art styles, such as the Pecos River Style (ca. 4000 B.P.), found near the lower reaches of the Pecos River in Texas. The figure may have been painted without a head using a depression in the rock surface as that body part. In addition, the symbol of the hourglass is representative of the younger "mythological twin," Born-for-Water or Child-of-the-Water, as found in many Southwestern cultures including Puebloan and Apache groups.

The negative, boxed equilateral cross, 1-L, is impossible to identify culturally due to the widespread distribution of the cross symbol, both prehistorically and historically. The equilateral cross may have originated with the Jornada-influenced intrusion into the Southwest that may have occurred around A.D. 1000. The influence may also have originated in the Casas Grandes area during its Medio period (A.D. 1200–1400), a short time later. The cross was certainly present in the area among Apache groups in the 17th and 18th centuries. There is also the possibility that the design derives from a Spanish Colonial Christian influence. It is also important to note that the cross appears to be found anywhere there are humans. The Tyrolean Iceman (Otzi), ca. 5300 years old, has the oldest tattoos ever found on a human mummy (Pabst et al. 2009). Among others, he had two cross tattoos on his body: one on his right knee and one on his left ankle (Pabst et al. 2009).

The possible tally of 10 weapons (2A-E), that appears to include atlatls, probably dates from the 18th or 19th centuries if the marks are truly a tally of weapons as seen in Plains Biographic Style rock art. The incongruous appearance of atlatls in 18th or 19th century rock art presents its own set of problems. If these images are atlatls and, yet, do not represent a Plains Biographic Style tally, this design could date to any point prior to or even after the arrival of the bow and arrow in the eastern Trans-Pecos. The imagery of the supposed atlatls in the Pecos River Style is no doubt Archaic and contemporary with the bulk of Pecos River Style rock art (ca. 4200–2750 B.P.) (Boyd et al. 2013). Atlatls noted in Red Linear Style rock art may date to about 1280 B.P. when Plains bison hunters arrived in the region. Recent research, however, suggests that the Red Linear Style may actually be older than the Pecos River Style (Boyd et al. 2013).

The age of the rock art depicting five probable atlatls at Meyers Springs has not been determined. Newcomb and Kirkland (1967) noted that much of the rock art at Meyers Springs appears to have been created over time by various visitors to the site. If

these atlatls, as well as the possible atlatls noted above at Jackson's Site 64 in Val Verde County, are indeed atlatls, they were most likely created prior to or shortly after the arrival of the bow and arrow to the region.

San Esteban Rockshelter, located in the Alamito Creek basin on a major north-south passageway through the area, provides an excellent stop-over point. With its permanent sources of water and available shelter, San Esteban was, no doubt, visited by many varied groups of people over a lengthy span of time. Individuals within these various groups painted and engraved designs on the shelter's walls.

Of course, it is not possible to know with certainty the intention of the individuals that created the rock art or to know what may have been related to others upon their viewing of the designs. The primary goal of this work has been to reflect on the rock art recording, which took place at the San Esteban Rockshelter during the 2000 TAS/CBBS field school and to record, describe, and discuss the rock art as it exists today.

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Many people who have recorded the rock art at San Esteban Rockshelter through time deserve credit: Victor Smith in the 1920s and 1930s, A. T. Jackson and Forrest Kirkland in the 1930s, Miriam Lowrance in the 1960s, Bob Hext and his students in the 1990s, and, finally, the Texas Archeological Field School participants directed by Teddy Lou Stickney in 2000. I would like to express my sincere appreciation to Melleta Bell, Jerri Garza, and the entire staff of the Archives of the Big Bend for their assistance in tracking down anything and everything *San Esteban*. Thanks, also, to the personnel at Wildenthal Library at Sul Ross State University.

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Guerrero Arrow Points: Patterns of Distribution and Archeological Implications

Steve A. Tomka

Arrow points recovered from Spanish Colonial missions present an interesting opportunity to investigate the relationship between point types and specific groups of people. This article proposes that as currently defined, the Guerrero mission arrow point type contains at least two formal variants. The distribution of these formal variants shown dramatic inter-regional differences across South Texas and the Central Coastal Plains. These inter-regional differences appear to correlate with the distribution of distinct indigenous groups. The overall distribution of these Guerrero variants and Perdiz arrow point types during Spanish Colonial times, cross-cut linguistic and ethnic boundaries reflecting the complex cultural and social landscape that emerged across the region by the mid-18th century.

Beginning with the establishment of Mission San Antonio de Valero in the upper reach of the San Antonio River drainage (Figure 1) and following the discovery of the burned down French settlement of La Salle, the Spanish Crown and Catholic Church embarked on a concerted effort to remake indigenous societies into their image. The policies and practices employed by missionaries and presidio soldiers forever altered the lives of indigenous groups living on both banks of the Rio Grande. This experiment profoundly changed the lives of nomadic hunter-gatherer groups by altering virtually every aspect of their lives, including their language, religious beliefs, and identity. Despite these dramatic changes, the manufacture of ceramics and stone arrow points continued within the missions of South Texas and the Coastal Plains. Ceramics, using traditional bone-tempered clay fabrics, continued to be made into the early 19th century (Fox 1977). Similarly, the manufacture of stone arrow points, known as Guerrero points, also continued until metal began to replace the stone points, sometime after the mid-18th century.

Guerrero points were defined on the basis of a number of specimens excavated at the Gateway missions of San Juan Bautista (1700) and San Bernardo (1702) in today's Guerrero, Mexico (Hester 1977a). The type is defined as a lanceolate to triangular-shaped concave-based arrow point that appears to be temporally restricted to the mission period (Hester 1977b; Turner et al. 2011:194). The type as currently defined contains a high degree of morphological variability (Hester 1989:Figures 13-1 and 13-2). This in part comes from the fact that all stemless arrow points found in mission context are by definition classified as Guerrero types. The morphological variability noted in the form is seen as resulting from idiosyncratic variability in lithic technology, or morphological variability introduced during the rejuvenation and resharpening of worn or failed specimens. The aforementioned approach to the Guerrero type eliminates consideration of the possibility that the morphological variability contained within the type may potentially reflect Spanish Colonial period indigenous population dynamics.

The making of triangular and lenticular arrow points during the Spanish Colonial period continues the lengthy tradition of triangular projectile point manufacture in South Texas and northeastern Mexico (Hester 2004; MacNeish 1958). Late Prehistoric lithic assemblages from South Texas are dominated by a variety of triangular arrow point forms variously typed as Fresno, Cameron, McGloin, and Starr (Hester 2004). In contrast, lenticular arrow points are less common although not entirely absent from prehistoric assemblages in both Texas (Campbell 1958; Corbin 1963, 1974) and northern Mexico (García Cook 1982; Stresser-Péan 2000). By the early 18th century, lenticular arrow point forms become much more common in archeological sites, particularly in selected Spanish colonial missions. The sudden dominance of lenticular forms in some mission collections is an interesting phenomenon that has elicited significant consideration by

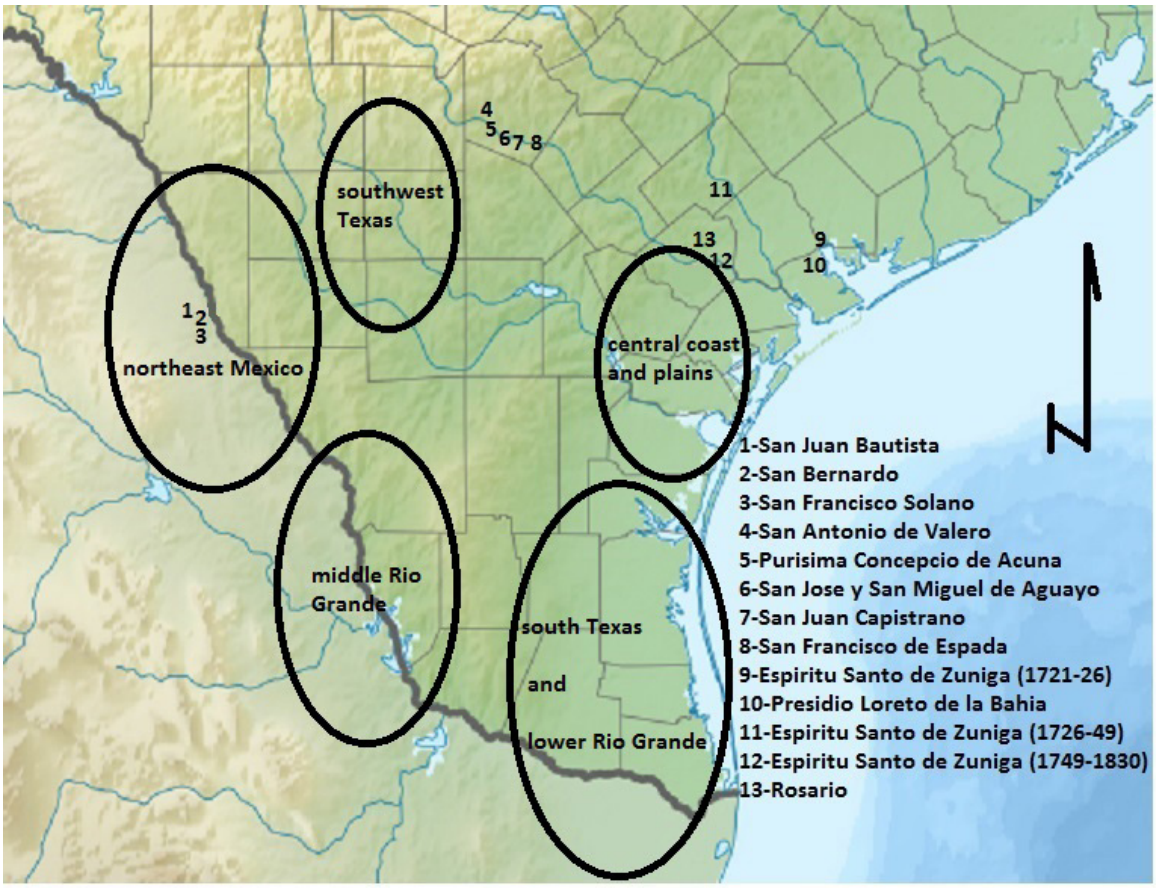

Figure 1. Missions, presidio, and regions mentioned in the text.

several archeologists. Specifically, some archeologists have suggested that the sudden appearance of lenticular forms may be related to the development of a new indigenous identity within the missions (Hester 1977b:10, 1998:100-101; Walter and Hester 2014). If this explanation is accurate, it would reinforce the perception of some archeologists that projectile point types can be linked to specific hunter-gatherer communities. Archeologists working within a culture historical framework have traditionally accepted this assumption, but rarely have examples from historic period archeological case studies been used to examine its accuracy.

This article examines the morphological variability currently subsumed within the Guerrero type. It concludes that variants may indeed represent distinct types. The overlap between arrow point variants and specific indigenous groups inhabiting the South Texas and Coastal Plains regions is also evaluated. The findings suggest that the differential distribution of Guerrero arrow point variants correlates with the distribution of certain indigenous groups that inhabited the region. The implications of these findings are explored specifically as they relate to the role of material culture in reflecting different social dynamics under distinct conditions.

The Guerrero Arrow Points

As noted above, Guerrero points range in form from triangular to lenticular specimens. The triangular forms have straight-to-recurved blade edges and bases that range from straight, to slightly concave, deeply concave, and even V-shaped (Figure 2).

The lanceolate form also consists of two principal variants. The first has a leaf shape characterized by a contracting stem and a widening blade toward the distal tip (Figure 3a). The base is only 4-6 mm wide but reaches 9 mm or more at the neck. The maximum width of the point is well forward of the neck and can reach 12-14 mm. The second variant is virtually parallel for much of its length (Figure 3b). In some instances, the ears of the base flare outward

Figure 2. A variety of triangular arrow point forms from Mission San Juan.

Figure 3. Contracting stemmed (a) and parallel-stemmed (b) varieties of Guerrero points recovered from 41VT11 (G. C. Martin Collection).

for 1-1.5 mm but within 2-3 mm of the base, the stem becomes parallel-sided. The bases of these variants range from straight to slightly concave.

The arrow point samples used in this study consist of specimens recovered during excavations sponsored by the National Park Service at five missions in San Antonio (Mission San José y San Miguel de Aguayo, 41BX3; Mission San Juan Capistrano, 4BX5; Mission Concepción, 41BX12; Mission San Francisco de Espada, 41BX4; and Mission San Antonio de Valero, 41BX6). In addition, Guerrero projectile points recovered from the second and third locations of Mission Espíritu Santo de Zuñiga (41VT11 and 41GD1, respectively), the arrow points from the first site of Presidio La Bahia (41VT4), and the arrow points from Mission Rosario (41GD2) also were analyzed for this study (see Figure 1).

A total of 283 projectile points were individually examined for this study. These specimens derived from nine site collections. Two additional collections were not available for hands-on examination. They consisted of the projectile points from the San Bernardo and the San Juan Bautista missions. These two collections have an additional 78 arrow points. Nonetheless, given the excellent photographs of the collection (Inman 1997), it has been possible to conduct some minimal observation and categorizations of these two collections as well. Specifically, the typological assignment of each of the 361 specimens was reviewed. The projectile point sample consisted of 338 Guerrero points and 23 Perdiz points. While other point types were also present in small numbers, these were not tabulated and examined.

The 338 Guerrero points were categorized into morphological groupings (lenticular versus triangular) either during first-hand examination or based on photographs of specimens. The sample consisted of 301 functional specimens and 37 preforms broken during manufacture. Some of these could be categorized into lanceolate or triangular forms, but the bulk could not.

The Missions

As mentioned earlier, the sample of arrow points used in this article comes from 10 archeological sites: nine missions and a presidio. As a group, the sites date from the early 18th century to the early 19th century and represent just over 100 years of mission operations in Texas. The mission assemblages discussed, the dates of occupation, and the principal indigenous groups that resided at the missions are listed in Table 1.

While the missions kept comprehensive marriage, baptismal, and burial ledgers, complete records of the indigenous nations that were present in each mission do not exist, except for Mission Valero. The records of the other four missions cover the late eighteenth and early nineteenth century (1772 to 1824). Nonetheless, diaries of inspection tours of each mission provide sufficient data to depict broad trends in population makeup and fluctuations in numbers over the lifetime of each mission. The individual nations reduced into each mission and the broad population trends noted below are based on the combination of these surviving mission records and translated Spanish inspection diaries. Only those indigenous groups living at each mission are mentioned in which the location of their home territories is reasonably well known. The term "nation" is used here because we do not have a well-defined understanding of the social structure of the various historic groupings that inhabited the area, and because the native groups apparently employed these terms. The linkage of given groups with specific regions of South Texas and northeastern Mexico is based on information derived from a variety of sources including historic maps, Spanish diaries, mission records, and modern reviews of the social landscape of the regions (i.e., Almaráz 1979, 1980; Campbell 1988; Campbell and Campbell 1981; Foster 2008; Salinas 1990).

The two gateway missions were established just as the Spanish began systematic incursions into East Texas. The populations of these two missions consisted of indigenous groups from northeastern Mexico (Coahuila and Nuevo Leon, and the north bank of the Rio Grande). By the time Mission San Juan Bautista was moved to its current location in 1740, following two previous moves, all five of the missions in the upper San Antonio River basin had been established. Mission Solano, which was originally founded for the Xarame nation in 1700, was reestablished for the third and final time, near the gateway missions in 1720. At least during the latter half of the 18th century, the bulk of the population of the two missions consisted of the Pacuache, Pastaloca, Pacoa, Pampopa, Mescal, and Malaguite nations (Almaráz 1980; Campbell 1979). The home range of many of these groups was in northeastern Mexico, although others ranged on both sides of the Rio Grande.

When Mission San Antonio de Valero was founded in 1718, a number of neophytes from Mission Solano followed. For instance, the entire Xarame contingent (n=165 people), came along and immediately became one of the larger native groups present at San Antonio de Valero. Shortly thereafter, the Xarame were joined by the Payaya and Pamaya from south of the San Antonio River. These groups moved with the mission to the third and current site as it was re-established east of the great bend of the San Antonio River in 1724. Of the 110 groups that resided at the mission, nearly half (n=51, 46 percent) came from the middle Rio Grande valley, northeastern Mexico, and near the headwaters of the Frio and Nueces rivers. Eighteen (16 percent) groups originated from South Texas and the lower Rio Grande valley, and 10 (9 percent) others came from the central coast and coastal plains between the mouth of the Guadalupe-San Antonio rivers and the Nueces River and inland into present-day Goliad, Bee, Refugio, and Victoria counties.

In 1720 Mission San José y San Miguel de Aguayo was established by the College of Zacatecas. Its expressed purpose was the recruitment of coastal indigenous groups. It was moved twice before finally settling at its present location, which was only a short distance from its second home. A total of 36 indigenous groups were congregated at the mission during its lifetime. The Pampopas (n=200), Pastias, Mesquites, and Suliajames were the four principal groups present at the founding of the mission and these groups continued to reside there in large numbers even after it was moved to its third site in 1740. By 1768, the Postitos also became a major component of the mission population, and many of

Table 1. List of missions with arrow point collections mentioned in the text.

Mission/Presidio Name	Site	Founding	Abandonment	Principal Indigenous Nations*
San Juan Bautista		1740 or 1741	1794	Malaguites, Mescal, Campacuas, Paco, Patalaco, Pampopa
San Bernardo (north)		1702	1794	Pacuache, Pachal, Paco
San Antonio de Valero	41BX6	1724	1793	Xarames, Payayas, Hierbipiames, Sama, Tacame, Siaban, Payaya, Cocos, Apache, Pamayas
Nuestra Señora de la Purísima Concepción de Acuña	41BX12	1731	1824	Pajalaches, Manos de Perro, Siguipil, Pitalaques, Tacame, Pacaos, Tilpacopal, Patumaco, Sanipao, Malaguites
San José y San Miquel Aguayo	41BX3	1734	1824	Pampopas, Pastias, de Suliajames, Borrados, Mesquites, Payaya
San Juan Capistrano	41BX5	1731	1824	Pacaos, Pajalaches, Chayopines, Venados, Orejones, Pamaques, Piguiques, Malaguites, Tilijaes
San Francisco de la Espada	41BX4	1731	1793	Tacames, Pitalaques, Borrados, Pajalaches, Malaguitas, Pacaos, Viayan
Presidio La Bahia; Fort St. Louis	41VT4	1722	1726	Cocos, Karankawas
Espíritu Santo de Zúñiga	41VT11	1726	1749	Aranama, Tamique, Karankawa
Espíritu Santo de Zúñiga	41GD1	1750	1830	Aranama, Tamique, Piguique, Manos De Perro, Tawakoni, Tonkawa
Nuestra Señora del Rosario	41GD2	1754 1789	1781 1808	Copanes, Guapites, Cujanes, Cocos, Karankawas

*Bolded group names present at founding

the neophytes were said to speak the language of the Postitos when the mission was visited by Fray Solís that year (Forrestal 1931). Sixteen (44 percent) of the 36 nations that resided in the mission over its lifetime came from the lower Rio Grande valley, the delta, and South Texas. Only eight (22 percent) of the 36 nations with known territorial origins came to the mission from the central coast between the mouth of the Guadalupe River and the Nueces River and from immediately inland of this area, particularly from Goliad, San Patricio, Bee, and Victoria counties. Only six nations originated from the middle Rio Grande valley, northeastern Mexico and southwestern Texas, and south of the Edwards Plateau in the upper reaches of the Frio and Nueces rivers.

Mission Concepción, Mission San Juan Capistrano, and Mission Espada were the final three missions established in the upper San Antonio River basin in 1730. They were the result of the failure of Spanish missions in East Texas. A total of 48 indigenous groups were congregated at Mission Concepción during the lifetime of the mission. The mission was originally founded for the Chayopines, Tilpacopal, Pajalat/Pajalache (n=124), and Siguipil groups. In addition to the founding populations, which combined typically constituted around 300 neophytes, some of the other groups that joined the mission in large numbers over time included the: Tacame (n=80), Manos de Perro (n=62), Patumaco (n=55), and Sanipao (n=37). Seventeen (37 percent) of the 46 nations with known territorial origins came to the mission from the central coast between the mouth of the Guadalupe River and the Nueces River and from immediately inland of this area, particularly from present-day Goliad, San Patricio, Bee, and Victoria counties. The next two well-represented regions at the mission are South Texas with 15 nations, and the lower Rio Grande valley and delta with 12 nations.

A total of 32 indigenous groups were congregated at Mission San Francisco de Espada during the lifetime of the mission. The principal groups present at the founding were the Pitalaque, the Pajalache, and the Pacaos. The Tacame (n=200) resided there in large numbers during the late 1730s and the Borrados and Malaguites from the coast were also present. Ten of the 32 indigenous groups with known territorial origins present at the mission came from the central coast and nearby coastal plains. The two next largest groupings came from the lower Rio Grande valley and South Texas (n=8), followed by the middle Rio Grande and northeastern Mexico and neighboring southwestern Texas (n=7).

Finally, 30 indigenous groups were congregated at Mission San Juan Capistrano over its lifetime. The mission was opened for the Pitalaques, Pajalaches, Pacaos, Tilijaes, and Venados. The Chayopines (n=80), Venados (n=70), Piguiques, Pamaques, Orejones, and Chayopines made up 203 individuals in 1762. Thirteen (43 percent) of the 30 nations present at the mission were from the central coast and coastal plains. Seven (23 percent) were residents of South Texas and the lower Rio Grande valley and seven others were from the middle Rio Grande, northeastern Mexico, and southwestern Texas.

The coastal missions were established to aid in the settlement of the Karankawa and related groups. Presidio La Bahia was built in 1721 on the ruins of Fort Saint Louis (41VT4), the former French settlement. Mission Espíritu Santo de Zuñiga was erected nearby on Garcitas Creek. The Cocos and Karankawas were congregated at the mission. After five hard years accompanied by poor agricultural production and low cattle numbers, the site was abandoned in 1726. The second site of the mission was on the banks of the Guadalupe River. The principal settlers were the Aranama and Tamique groups from the lower Colorado River valley. The mission continued to be occupied for 23 years without much success in attracting the Karankawa. In 1750, it was relocated and re-established on the San Antonio River, where it continued in operation until 1830. Even at its third location, Karankawas never joined the mission; the principal resident groups consisting instead of the Aranama, Tamique, Piguiques, Manos de Perro, Tonkawa, and the Tawakoni. Mission Rosario was established in 1754 on the San Antonio River at the expressed request of the Copanes, Guapites, and Cujanes, Karankawa-related groups (Gilmore 1975). These three principal groups and smaller numbers of Karankawa proper constituted some 400 neophytes in the mission in 1758 (Gilmore 1975:5). By 1781, the mission was abandoned due to crop failures and various conflicts between the neophytes and the nearby presidio. Fray José Mariano Reyes, from the College of Zacatecas, re-established the mission in 1789. In 1797, there were a combined 97 Cocos and Karankawa proper residing at the mission (Gilmore 1975:11), the first time that the Spanish were successful in introducing the Karankawa to mission life. Shortly after the 1797 census, the Karankawa were moved to Mission Refugio, leaving the Cocos as the main resident

population of Rosario. Rosario continued in use until 1808, at which time the mission was attached to Mission Refugio and the remaining neophytes and property were transferred to the latter mission.

Technological Comparison of Lanceolate and Triangular Guerrero Points

Before considering the variable distribution of the Guerrero variants between the aforementioned missions, it is necessary to establish whether the variants are technologically related to each other or represent distinct forms (types). This discussion begins with the consideration of the lenticular arrow point forms. Many of the lanceolate and parallel-stemmed Guerrero points have a plano-convex cross-section. Manufacture-failed specimens indicate that the lanceolate Guerrero blanks are made on blades or blade-like flakes with one or two dorsal ridges. These blanks have minimal longitudinal curvature, diffuse bulbs of percussion, are at least 30 mm wide, and do not exceed 7-8 mm in thickness. The blades were removed using a hard-hammer percussor and the platform end of the flake blank tended to serve as the distal end of the projectile point. The convex face of the point often exhibited highly regular tangentially-oriented parallel pressure flake scars. However, not all specimens exhibited parallel flaking, and those that did often only have it on the convex (i.e., dorsal) face of the specimen.

The height of the dorsal ridge on the flake blank conditions the orientation of the thinning flakes. Dorsal ridges that protrude significantly above the surrounding face of the blank can be most effectively thinned by flaking tangentially to the longitudinal axis of the ridge. If the flake or blade blank is minimally curved, once the dorsal face of the blank is thinned, the remaining flake removals occur off the ventral face and focus on the removal of any longitudinal curvature in the flake blank and the shaping of the projectile point, including its base. If the flake blank is relatively thick, both ventral and dorsal faces will be extensively flaked. However, if the flake blank approaches the ideal parameters, only minimal flaking of the ventral face is carried out. This is why nearly all of the lanceolate Guerrero points retain a portion of the original flake blank's ventral face on the planar face of the specimen.

In contrast to the parallel-stemmed forms, the manufacture of triangular arrow points starts with flake blanks that are relatively short, but sufficiently wide to provide enough raw material to allow for the bifacial reduction of the blank. Typically, the flake blank is bifacially reduced; therefore, few of the completed specimens retain any portion of the blank's ventral face. Of the 72 triangular points examined from the five San Antonio missions, only 25 (36 percent) retained any portion of the original flake blank's ventral surface. The bi-convex cross section of these forms and their shorter finished lengths indicates that the blanks are relatively wide to allow for the removal of a number of flakes from both faces and edges of the blank without narrowing the projectile point dramatically during manufacture. The flake blank's platform is typically oriented toward the distal end of the projectile point. However, a small number of cases have been noted where the platform is on the side of the projectile point blank.

In addition to differences in the manufacturing strategy of lanceolate and triangular points, there also are distinct approaches to their rejuvenation. These differences result in additional technologically diagnostic traits that allow these forms to be distinguished from each other. Arrow points are rejuvenated for two principal reasons: to remain sharp during use and to refurbish broken points that retain sufficient blade length to remain functionally viable upon rejuvenation.

Resharpening and rejuvenation (repair) of the lanceolate Guerrero points is rather consistent and leads to the retention of the parallel stem edges of the projectile point. This derives from the manner in which lanceolate Guerrero points are hafted. Parallel or slightly contracting stem Guerrero points are bound to the haft by wrapping the sinew around the stem and projectile foreshaft, thereby covering the proximal stem of the point (Figure 4a). Failed arrow points, when broken well above the neck, are typically re-tipped while in the arrow shaft or foreshaft. The reworking changes the shape of the portion of the blade that sticks above the wrapped haft, but it does not alter the morphology of the stem since it is not accessible to the flaking tool. Therefore, the stem of even heavily reworked lanceolate arrow points will remain parallel-sided (Figure 4a). In contrast, portions of the blade that fall above the hafting will be flaked to create the new functional tip. This rejuvenation method ensures that a lanceolate Guerrero point will always maintain the lanceolate parallel-sided stem edges rather than being rejuvenated into an entirely distinct form, such as a triangular point.

Figure 4. Reconstructed hafting method of: a, parallel-stemmed Guerrero point; b, triangular Fresno point.

It is recognized that failed projectile points could be rejuvenated while still in the haft but with the binding agent removed. Richard McReynolds has recently showed me a number of arrow points exhibiting traits that are consistent with this rejuvenation strategy (Richard McReynolds, personal communication 2015). Following this discussion, I reexamined the specimens in this study and found that very few of them possessed the diagnostic traits identified by the exceptional Mr. McReynolds. Rather, the typical rejuvenation technique employed in the samples examined appears to have taken place while the point was securely hafted and likely bound in the haft.

Figure 5 illustrates a nearly pristine lanceolate point next to a heavily rejuvenated proximal fragment. The specimen exhibits some traits suggesting that it was perhaps rejuvenated while still hafted. Nonetheless, it is evident that the parallel stem of the specimen is retained even after the blade has been extensively shortened due to a distal blade failure and its attempted rejuvenation.

Microscopic inspection of the proximal portions of the blade edges of triangular points and the morphology of the blade edges indicate that these specimens are hafted using a different approach. Namely, to ensure that the stone tip has a solid purchase against the foreshaft, the binding agent is crossed from the right side of the blade margin to the left side of the shaft/foreshaft and vice versa (see Figure 4b). This technique ensures that as the sinew dries, it pulls the point in and solidly seats it against the foreshaft. To ensure that the sinew is not cut during this process, the proximal blade edges of some of the points are often lightly ground. This hafting technique leaves the distal two-thirds of the blade exposed and available for retouch. Following repeated rejuvenation attempts, a distinct change in the angle of the blade edges develops that is very diagnostic of rejuvenated triangular arrow points and cannot be recreated during the rejuvenation of parallel-stemmed Guerrero points.

In summary, the examination of the manufacture and rejuvenation strategies associated with lenticular and triangular Guerrero variants suggests that the two forms are not related technologically. More specifically, it does not appear that lenticular variants of the

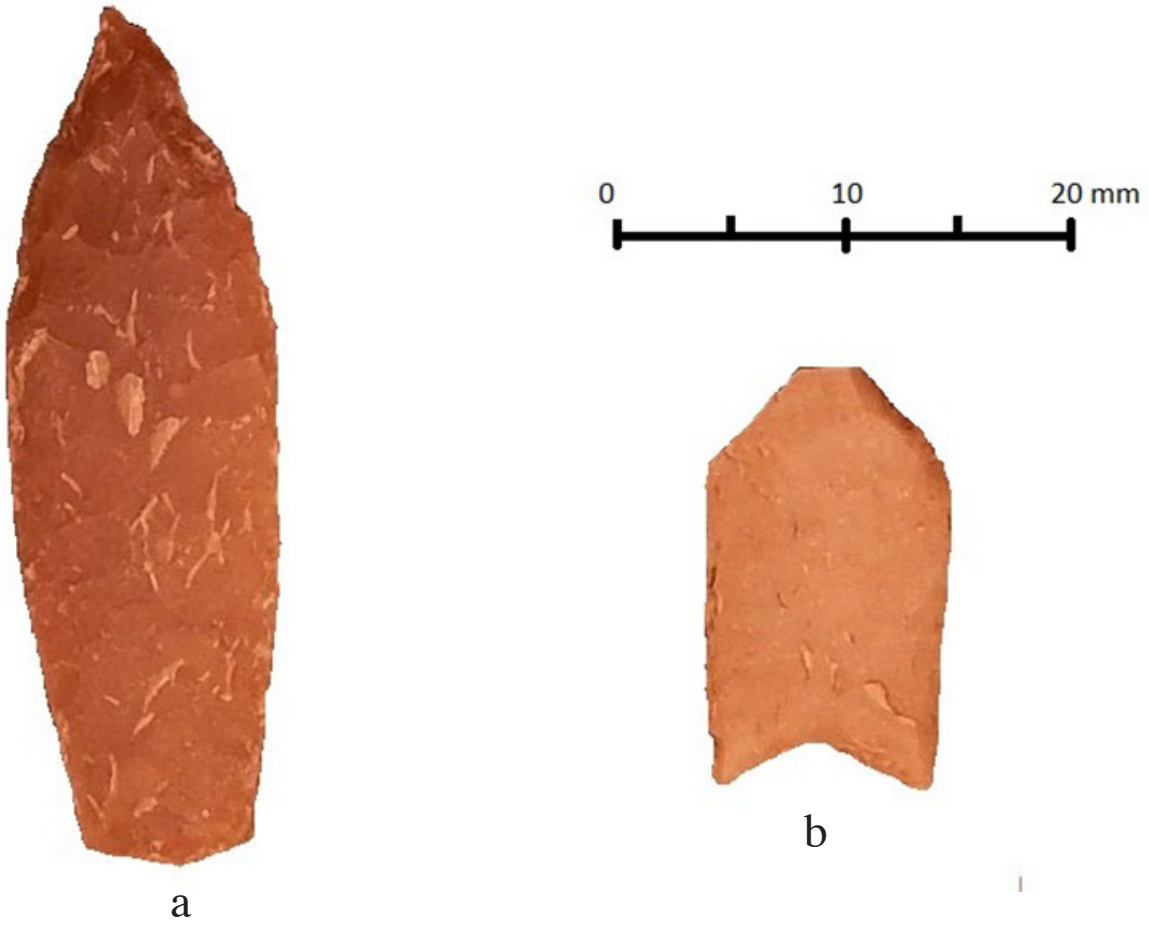

Figure 5. Nearly pristine contracting stemmed Guerrero point (a) next to a heavily rejuvenated proximal fragment (b).

Guerrero points undergo morphological transformation during their use life that result in the triangular variant that is often seen in mission assemblages in conjunction with lenticular forms. The flake blanks employed, the approaches to their manufacture, as well as the rejuvenation strategies used, are distinct between the parallel and triangular Guerrero variants. The implications of this conclusion are that the distributions of the Guerrero arrow point variants potentially carry with them information related to the distribution of distinct indigenous groups across South Texas and the Central Coastal Plains and within the missions discussed above. These implications are addressed in the following section.

Analysis of Distribution

Table 2 presents a breakdown of Guerrero and Perdiz points present in the mission assemblages mentioned above. Perdiz points are included in this analysis because during historic times they were associated with Karankawa groups and therefore they signal the presence of the Karankawa in the sites discussed herein.

It is evident in Table 2 that Perdiz points are only present in one of the missions of the upper San Antonio River basin, Mission San Antonio de Valero. The record of the indigenous groups present in the San Antonio missions indicates that while so-called Karankawa-related nations were present at Mission San José, Mission Concepción, and at Mission Valero, members of the Karankawa proper were only recorded at Mission Valero: 17 Karankawa individuals are recorded there in 1763 (Schuetz 1979:Table 3:3). On the other hand, with the exception of Mission San Juan and Espada, the other three missions list Copanes, Cujanes, and Coapites in their records, yet no Perdiz points were recovered at these other sites. This suggest perhaps that while the Copanes, Coapites, and Cujanes were

Table 2. Guerrero and Perdiz arrow point samples from selected South Texas and Coastal Plains sites.

San Antonio Missions/Ranch	Guerrero	Perdiz	N
Mission San Antonio de Valero	45	2	47
Mission San José	29	-	29
Mission Concepción	30	-	30
Mission San Juan	40	-	40
Mission Espada	11	-	11
Total	155	2	157
Other Spanish Colonial Sites			
San Bernardo-north	55	-	55
Fort Saint Louis; Presidio La Bahia (1721-1726, 41VT4	31	15	46
Espíritu Santo #2 (1726-1749, 41VT11)	21	1	22
San Juan Bautista	21	2	23
Espíritu Santo #3 (1749-1830, 41GD1)	37	2	39
Mission Rosario (1754-1789 and 1794-1807, 41GD2)	18	1	19
Total	183	21	204

in some form related to the Karankawa proper, they did not adopt the use of the Perdiz projectile point, a prominent trait of Karankawa material culture.

To examine the origins of the lenticular Guerrero variant, Guerrero point samples listed in Table 2 were divided into parallel/lanceolate and triangular variants. Those specimens that retained any parallel sides in the vicinity of the base were grouped into the lenticular or parallel-sided subgroup and those that exhibited inward angled blade edges immediately from the corner of the base were categorized as triangular in shape. Table 3 provides a breakdown of the parallel and triangular Guerrero arrow points.

Both triangular and parallel-stemmed variants are present in most mission assemblages (see Table 3). In some samples, the triangular variant of the Guerrero outnumbers the lanceolate variant by a wide margin. There are two sites among the Coastal Plains group, however, in which the lanceolate form is more common than the triangular form. These sites are the second locations of Mission Espíritu Santo de Zuñiga and Mission Rosario. In the collection from the second location of Espíritu Santo (41VT11, 1726-1749), only the lanceolate variety is present. The Guerrero point sample from Mission Rosario consists of 18 specimens, of these, 16 are lanceolate and only two are triangular, an 8 to 1 ratio.

Among the missions located in the upper reaches of the San Antonio River, the arrow point assemblage from Mission Concepción is also unusual because it is the only mission that has more parallel-stemmed Guerrero points than triangular forms. In fact, parallel-stemmed points outnumber triangular ones by more than 7:1 (see Table 3). In contrast, in the projectile point assemblages from Mission San José and Mission San Juan, the ratio of triangular forms to lanceolate forms is 3.1:1 and 1.7:1, respectively. Within the Mission Valero point collection, the ratio of triangular to lanceolate forms is 1.3:1. At the third location of Mission Espiritu Santo (41GD1) the ration of lenticular to triangular Guerrero variants is nearly equal: 1.2:1.

The triangular variant of the Guerrero points comprises 55 percent (71 of 129, preforms not included) of the projectile points in collections from the upper San Antonio missions. In contrast, however, they make up only 44 percent (75 out of 172, preforms not included) of the Guerrero points from the

Table 3. List of parallel and contracting stemmed Guerrero points in selected mission assemblages.

Spanish Colonial Sites	Parallel	Triangular	Guerrero Preforms	N
San Bernardo-north	36	19	-	55
San Juan Bautista	13	8	-	21
Presidio La Bahia; Fort St. Louis	-	31	-	31
Espíritu Santo (41VT11)	21	-	-	21
Espíritu Santo (41GD1)	17	16	4 (3 parallel; 1 unclassifiable)	37
Mission Rosario (41GD2)	10	1	7 (6 parallel; 1 triangular)	18
Total	97	75	11	183
Mission San Antonio de Valero	14	18	13	45
Mission San José	7	22	-	29
Mission Concepción	22	3	5	30
Mission San Juan	13	22	5	40
Mission Espada	2	6	3	11
Total	58	71	26	155

other Spanish Colonial site assemblages found on the Coastal Plains (Presidio La Bahia, the two locations of Espiritu Santo, and Mission Rosario).

If the development of the lanceolate or parallel-stemmed form is a reflection of, or response to, the evolution of a new social identity by groups living in the missions, it is possible that such change in identity would appear early in the mission residence period as indigenous groups attempt to differentiate themselves from the Spanish. On the other hand, it is possible that a new identify that reflects a confluence of distinct nations into a single Pan-Indian identity would develop late in the mission period as distinct groups negotiate with each other and eventually coalesce around a single identity. In either case, we would expect some temporal relationship between when lanceolate points begin to appear and then spread among the missions.

The lanceolate and parallel-stemmed forms are present in the Gateway mission assemblages established between 1700 and 1702. At San Bernardo, the lenticular forms outnumber the triangular ones nearly 2 to 1. Within the sample of arrow points from San Juan Bautista, the breakdown of lenticular and triangular variants is also nearly 2 to 1 in favor of lanceolate forms. To be sure, however, we do not know whether the points appear there during the early days of the mission or well into the life of the mission. The lanceolate form as well as the triangular variant also are present in the post-1718 Mission Valero collection. Nonetheless, the presence of the two forms at the earliest established missions may indeed imply that the new identity arose quite early in the cycle of missionization and may have begun in the missions of Coahuila and Nuevo Leon. Unfortunately, we lack sufficient temporal control for the provenience of projectile points, making it challenging to discern whether they appear early or late in the period.

The lanceolate form is not present in the arrow point collection from the first site of Presidio La Bahia, built on the site of Fort Saint Louis in 1721 and used until 1726. This could be due to the fact that the site was a military fort rather than a mission. The mission site was a distinct site near the Presidio. Nonetheless, arrow points are present at Presidio La Bahia, and they consist only of triangular forms and Perdiz types.

Distribution of Projectile Points and People

In comparing the distribution of Guerrero point variants to that of indigenous groups that occupied South Texas and the Coastal Plains during the 18th century, we begin with a small number of known facts. For instance, it has already been noted that the Karankawa proper who lived on the central Gulf Coast can be identified through their asphalt-decorated sandy paste pottery and their Toyah lithic toolkit, including Perdiz points. It was also noted above that the population of indigenous groups present at Presidio La Bahia on the ruins of Fort Saint Louis consisted of the Karankawa proper and the Cocos. The arrow points recovered from the site include 15 Perdiz points and 21 triangular forms. If the Karankawa are associated with Perdiz points, the Cocos, who according to the records were the only other occupants of the nearby mission, would have to be responsible for the manufacture of the triangular forms noted at the site. When in 1726 Espíritu Santo (41VT11) was reestablished on the banks of the Guadalupe River, the principal population that resided there consisted of Aranamas, Tamiques, and Karankawas (Oberste 1980). The Karankawa were present only for a short time before returning to their coastal settlements. The arrow points recovered from the site consist of 21 parallel-stemmed Guerrero points and one Perdiz point. No triangular Guerrero form has been recovered to date from the site. This suggests that two groups, the Aranama and the Tamique, who have historically been noted as often sharing a camp, likely were responsible for the lenticular Guerrero forms recovered from the site. The Karankawa proper likely were the makers of the Perdiz points.

When Espíritu Santo was moved to its third location on the San Antonio River in 1749, the Aranama and Tamique contingents followed and other coastal groups were added, including the Piguique and Manos de Perro, in addition to members of the Tawakoni and Tonkawa nations (Mounger 1959). The arrow point assemblage recovered to date from the site consists of 17 parallel-stemmed and 16 triangular forms, and three additional parallel-stemmed preforms. It has already been established that the Aranama and Tamique manufactured parallel-stemmed arrow points. The Tawakoni and Tonkawa likely made triangular Fresno-like points as has been documented in historic period assemblages attributed to them from across Texas (c.f. Duffield and Jelks 1961). The Piguique and the Manos de Perro appear to have inhabited the coastal bend area and the latter also occupied portions of the off-shore islands as depicted in historic maps of the region. As such, they are expected to have manufactured triangular arrow point forms similar to their neighbors, further inland.

At Mission Rosario, where the Copanes, Guapites, and Cujanes were the principal residents from 1797 on, parallel-stemmed Guerrero points are dominant in an assemblage that only contains one triangular form (as well as a triangular preform) compared to 10 parallel-stemmed specimens and six additional parallel-stemmed preforms. The Cocos and Karankawas were added to this mission very late during its life, and while they would have likely contributed triangular Guerrero forms and Perdiz points, respectively, the numbers of specimens should perhaps be low give the short period they resided in the mission. For instance, by 1797 the Karankawa were moved to Mission Refugio. Unfortunately, it is unclear how soon the Cocos and Karankawas arrived following the reopening of Mission Rosario in 1789. The Copanes, Guapites, and Cujanes who were the demographically dominant groups at the mission were likely the makers of lenticular forms.

If these relationships provide a feasible explanation for the distribution of parallel-stemmed and triangular arrow point variants in the Coastal Plains missions, how can we explain the distribution of these forms in the missions of the upper San Antonio River basin, and in particular the abundance of parallel forms at Mission Concepción? While members of the Aranama, Tamique, Coapites, Guapites, and Cujanes nations do appear in the records of Mission Concepción, they never formed large proportions of the overall population. Therefore, these groups, who may have made parallel-stemmed forms, could not be responsible for the over-abundance of the form at the mission. If the indigenous population of the Coastal Plains cannot account for these patterns, where do we turn?

Because the establishment of mission San Antonio de Valero began with a core of indigenous groups from Mission Solano combined with groups living near the upper reaches of the San Antonio River, these two regions serve as a good point from which to continue the search for an answer. In 1699, the population of Mission Solano consisted primarily of the Xarames, Payaguanes, Siabanes, Terocodames, Ticmamares, and a number of other indigenous groups from northeastern Coahuila and adjacent Texas in the upper Nueces and Frio

drainages (Maas 1915). Although we do not know what arrow point forms these groups may have manufactured, we do know that in the same general area of northeastern Mexico, at least some of the groups that inhabited Missions San Bernardo and San Juan Bautista were manufacturing both lenticular and triangular forms of the Guerrero point (see Table 2). And, as a matter of fact, of the five principal groups that resided at Mission Solano, three (the Xarame, Siaban, and Payaguanes) also inhabited the two gateway missions (Almaráz 1980).

The 1772 population census indicates that the bulk of the population of the two gateway missions derived from northeastern Coahuila, Nuevo Leon, and the nearby region of southwest Texas. The census identifies a combined 25 nations in the two missions. The Pacuaches, Campacuas, Mescales, Malaquites, Paco, Pachalaque, Pampopa, and Pastacal nations make up the bulk of the populations. Of these eight nations, seven also appear in the baptismal, marriage, and/or burial records of the San Antonio missions. Even more significantly, of the 25 combined nations living at the gateway missions, 19 (76 percent) also are residents of the San Antonio missions. These patterns suggest that rather than pursuing explanations at the individual group level, a regional approach to the explanation of the lenticular projectile point distributions may also be feasible.

Table 4 provides a territorial breakdown of the various nations inhabiting the missions of the upper San Antonio River drainage. Since the focus is toward a northeastern Mexico origins of lenticular Guerrero variants, the regional breakdown is limited to groups with territories in the lower and middle Rio Grande valley, northeast Mexico, South Texas, and neighboring southwest Texas.

The data indicates some dramatic differences in the regional origins of the populations in the five missions. For instance, the Mission San José population contains a greater proportion of groups from South Texas than northeast Mexico and the neighboring area north of the Rio Grande. In contrast, the population of Mission Concepción consists primarily of populations from northeast Mexico and adjacent areas of Texas. Indigenous groups from these same areas dominate the populations of Mission Valero and Mission San Juan. The population of Mission Espada is more evenly divided between these regions.

Even more interesting is the fact that the distribution of the lenticular and triangular Guerrero arrow points from the five missions mirrors—to a degree—the relative regional distribution of indigenous groups within these missions. The comparison of the patterns identified in Table 4 with those noted in Table 3 demonstrates that in the case of Mission San José, where South Texas groups outnumber those from northeast Mexico, the triangular projectile points also outnumber lenticular forms. In contrast, at Mission Concepción, where groups from northeastern Mexico greatly outnumber South Texas groups (see Table 4), lenticular forms greatly outnumber triangular variants.

Three missions do not appear to fit the expected pattern. Given the small arrow point sample (n=8) from Mission Espada, it is possible to suggest that this is due to the non-representative nature of the assemblage. While this may account for the lack of fit with the expectation, there may be a more likely explanation, namely that while the number of groups from northeast Mexico outnumbered the groups from other regions, the actual number of individuals from these regions reflected the reverse pattern. For instance, at least 200 of the

Table 4. Breakdown of the number of indigenous groups from the San Antonio missions by region of origin.

Region	San José	Concepción	San Juan	Espada	Valero
Lower Rio Grande	8	4	4	5	7
South Texas	6	4	-	1	8
Mid-Rio Grande Valley	-	-	-	1	4
Northeast Mexico	5	8	2	3	25
Southwest Texas	4	13	7	4	24
Total	23	29	13	14	68

300 or so individuals present at the Mission Espada founding ceremony in 1730 came from among the Pacaos and Venados, two South Texas groups. The predominance of groups from South Texas continued throughout the rest of the mission's operation. Even in 1762, the census showed that 207 individuals in the mission were from South Texas groups, including the Pacaos and Maraguitas.

While we cannot reconstruct the specific number of individuals by regional origin for Mission San Juan, Habig (1997:Appendix I) indicates that there were 10 nations that were most populous in the mission: the Malaguecos, Orejones, Pacaos, Pajalaches, Pamaques, Piguiques, Pitalaques, Chayopines, Tilijaes, and Venados. Of these nations, two were from the lower Rio Grande valley, seven were from the central coast and coastal plains in the vicinity of Bee, Goliad, and San Patricio counties, and only one was from the north bank for the Rio Grande in the vicinity of the Nueces River and Frio River headwaters.

Overall, ethnohistoric records identify a total of 19 groups living in the vicinity of Corpus Christi Bay and inland of the coast. Ruecking (1955) identified 17 of these groups as forming the Orejon cluster, the members of which often traveled and camped together (although see Campbell [1975]). They inhabited the coastal strip between the mouths of the San Antonio and Nueces rivers, and ranged inland across what are now San Patricio, Bee, Goliad, and Victoria counties. Of these groups, 12 (71 percent) were inhabitants of Mission San Juan. No other regionally specific group of indigenous nations is present at anywhere near this concentration at the mission. Members of the Orejon Cluster outnumber all other regionally defined indigenous groups (i.e., groups from South Texas, Central Texas, or from near the headwaters of the Frio and Nueces rivers). Therefore, it is likely that these groups that clustered in this geographically circumscribed area are responsible for the production of the abundant lenticular points at the mission.

Finally, at Mission San Antonio de Valero, the number of indigenous groups from northeastern Mexico and southwest Texas outnumbers those from other regions nearly three to one (see Table 4). However, less than five individuals make up the total number of individuals of each nation from northeast Mexico and southwest Texas. Schuetz's (1979:Table 3:3) compilation of the population census from the mission indicates that during the lifetime of Mission Valero, seven groups were represented by more than 100 individuals. They were the Apache (n=129), Coco (n=138), Hierbipiamo (Yerbipian n=130), Payaya (n=212), Sana (n=132), Emete (n=165), and the Xarame (n=165). Of these groups, the Coco were residents of the Upper Gulf coast, the Yerbipiam lived in the area between the Brazos and Navasota rivers, the Emete were from the central coastal plains, and the Payaya had their territory between the Medina and San Antonio rivers. Of these groups, only the Xarame can be territorially associated with northeastern Mexico and the neighboring region in Texas south and east of the Edwards Plateau.

These reviews of the distribution of lenticular and triangular Guerrero points and indigenous populations within the missions and their territorial origins suggest that the origins of the lenticular arrow point forms can be explained in two ways. One group that seems to be clearly associated with these point forms consists of the Aranama and associated Tamique groups. It is also likely that the Copanes, Cujanes, and Guapites produced the same arrow point morphology.

Interaction between indigenous groups living on the coastal plains with the San Antonio missions was limited because of "territorial" disputes between the Querétaro and Zacatecan colleges of the San Franciscan Order that managed these missions (Castañeda 1938:181-182). Such disputes were not uncommon and related to who owned the neophytes who joined each mission (Wade 2008:118-129). These disputes affected the recruitment patterns of indigenous groups and resulted in little overlap in populations between the missions of the coast and those in San Antonio. Instead, the padres that managed the San Antonio missions focused their recruitment on the portion of the central coastal plains and coast in the vicinity of Corpus Christi Bay, South Texas, southwest Texas, and to a lesser degree northeastern Mexico. Thus, the presence of lenticular arrow points in the San Antonio missions cannot be accounted for by contact with the Aranama, Tamique or Karankawa-related groups.

Two patterns appear to emerge from the analysis of the regional distribution of Guerrero arrow point variants. First, indigenous groups from northeastern Mexico and nearby southwest Texas appear to be responsible for the manufacture of lenticular arrow point forms found in the lithic assemblages from the San Antonio missions. Second, indigenous groups inhabiting the Lower Coastal Plains,

and the Central Coast and Coastal Plains, may be responsible for the triangular Guerrero variants found in the coastal and upper San Antonio River basin missions.

Based on these patterns, Table 5 provides a breakdown of all of the indigenous groups present within the San Antonio missions for which territorial origins has been established. Also presented are the arrow point forms assumed to have been manufactured by each group. The Cocos were responsible for the manufacture of triangular points and the Cujanes, Copapites, Copanes, and the small number of Aranamas and Tamiques living at San Antonio missions made lenticular forms. In addition, it is assumed that the Sanan and related groups with whom the Aranama often camped made lenticular forms while the Tonkawa and related groups (i.e., the Cantona, Muruame, Tov, Yojuane, etc.) made triangular forms, as did the groups centered on the region of Corpus Christi Bay.

In four of the five San Antonio missions, the ratio of triangular to lenticular arrow point forms does follow expectations. That is, in missions where groups from South Texas, the lower Rio Grande, the Central Coastal Plains, and Central Texas dominated the mission population, triangular variants outnumber lenticular ones. In contrast, the only mission where groups from northeastern Mexico, the mid-Rio Grande valley, and Karankawa-related groups dominated, lenticular variants of the Guerrero outnumber the triangular forms. The single exception to this pattern is Mission Valero, where the number of groups that likely made lenticular Guerrero points is high. Regardless of the number of nations from northeastern Mexico and vicinity, however, the number of individuals that likely made triangular arrow point forms outnumbers the actual number of individuals from along the middle Rio Grande drainage.

Summary, Discussion, and Conclusions

The occurrence of Perdiz points within the Coastal Plains missions is correlated with the presence of Karankawa groups in these missions. In contrast, morphologically distinct lenticular arrow point forms were manufactured by Karankawa-related coastal groups including the Copanes, Cujanes, and Guapites. Yet another Karankawa-related group, the

Table 5. Breakdown of indigenous group numbers by region and mission within the San Antonio missions. The form of Guerrero arrow point assumed to have been made by the regional groups is presented in parenthesis.

Spanish Colonial Sites	San José	Concepción	San Juan	Espada	Valero
Lower Rio Grande (T)	8	4	4	5	7
South Texas (T)	6	4	-	1	8
Upper Coast Cocos (T)	-	-	-	-	-
Central Coast (T)	5	7	12	5	6
Tonkawa-related (T)	1	1	-	1	8
Mid-Rio Grande Valley (L)	-	-	-	1	4
Northeast Mexico (L)	5	8	2	3	25
Southwest Texas (L)	4	13	7	4	24
Sanan-related (L)	-	-	-	1	6
Aranama/Tamique (L)	1	1	-	-	2
Copanes, Cujanes, Guapites (L)	1	3	-	-	2
Groups Making Triangular Forms (T)	20	16	16	12	29
Groups Making Lenticular Forms (L)	11	25	9	9	63
Ratio of T:L Guerrero Point Variants	22:7	3:22	22:13	6:2	18:14

Cocos, also likely manufactured triangular arrow points. The Aranama and the related Tamique also manufactured lenticular arrow point forms. Neither of these two were affiliated with the Karankawa and indeed were for some time considered enemies of the Karankawa.

Other lenticular arrow point forms are present at missions in the upper San Antonio River basin, but these do not appear to have a relationship with those manufactured by groups on the Central Coastal Plains. Rather, they appear to be associated with groups that inhabited the middle-Rio Grande drainage, northeastern Mexico and nearby southwest Texas, and areas south and east of the Edwards Plateau. Some of these groups have been identified as members of the Catujano or Guiquechale indigenous confederacies (Wade 2003:17-18, 226-227).

Triangular variants of the Guerrero point also are present in assemblages from the Central Coastal Plains (i.e., third site of Espíritu Santo de Zuñiga and Presidio La Bahia). These were likely made by the Manos de Perro and the Piguiques, who were part of the Orejon Cluster, and the Cocos, who were present at the mission near the presidio. The members of these same three nation also may have manufactured some of the triangular points present at the missions of San Antonio. Yet, most appear to be associated with the residence of South Texas groups living in these missions. These groups were likely members of a number of indigenous group entities such as the Carrizos, Tortugas, and Comecrudos, each of these names encompassing multiple individual nations.

Ricklis (1992) has established that the ancestors of the Karankawa, the groups that were responsible for the Rockport Complex archeological manifestation, adopted the Perdiz point as part of a general techno-complex. Certainly, the spread of the Toyah lithic tool kit across nearly all of Central Texas into areas clearly inhabited by a series of distinct ethnic entities, increases the likelihood that in this instance, the distribution of the point form does not equate with the distribution of a single ethnic entity (see also Arnn 2012). Interestingly, the Karankawa proper adopted the manufacture of Perdiz arrow points but neighboring groups that were supposedly related to the Karaknawa (i.e. Coapites, Cujanes, and Guapites) chose to manufacture lenticular arrow point forms. Even more intriguing is the possibility that these lenticular variants of the Guerrero projectile point form also were made by a nearby cluster of indigenous groups (i.e., the Aranama and Tamique; Aranama Cluster; Ruecking 1955) who, as far as we know, were ethnically unrelated.

In contrast, some coastal groups who lived in a geographically well-defined area of the Central Coastal Plains manufactured triangular variants of Guerrero points and these groups seem to correspond to the historically defined Orejon Cluster. The majority of the groups in this cluster are described as Coahuiltecan, yet others do not share this affiliation. For instance, while the Pasnacane, Piguique, and Viayan were members of the cluster, they may also have been subdivisions of the Pamache, a non-Coahuiltecan group (Campbell 2013). Similarly, the Cocos, who were assumed to be Karankawa-affiliated, also manufactured triangular arrow point forms. In South Texas, yet another grouping of nations that was not ethnically related to the Orejones manufactured triangular arrow points. These groups may have interacted regularly with neighboring inland groups (i.e., Mayeye and Yojuane) who also made triangular arrow points and were likely affiliated with the Tonkawa.

The overall impression obtained from this analysis is that lenticular and triangular Guerrero arrow point variants have no direct relationship to ethnic identity at any given scale. They cross-cut individual ethnic groups or entities (i.e., Orejon Cluster, Aranama Cluster), and they are adopted by seemingly unrelated groups (Orejon Cluster and Karankawa-related groups), presumably because they were more effective in achieving an outcome (i.e., killing and processing prey) than they were as signals of ethnic or social identities. In the remainder of this article, I provide a brief discussion of the processes that lead to the creation and analytical recognition of morphologically consistent groupings of artifacts, and how these groupings may take on varied capacities within a broader cultural context. I argue that there may be a correlation between projectile point types and communities of people, but this relationship is much more complex and multi-dimensional than we tend to assume when we associate a given point type with a single social unit, namely a single group of people.

The interpretation of morphological variability in projectile points has long been contested between two principal camps. One camp views the morphological variability as representative of functional adjustments by hunter-gatherers to the changing landscape of animal species being hunted. The other

more traditional group interprets the variability in form (i.e., styles) as informative about chronology and reflective of some degree of social affiliation between the people who consistently manufactured the same form over time. The implication of the second perspective is that morphological consistency is reflective of a shared mental template of how to make a dart point or arrow point, and therefore would reflect group identity.

Projectile point types are constructs of archeological analyses that allow one to reduce morphological variability to a more manageable scale. By no means does there have to be a similarity between how prehistoric people categorized their projectile points compared to the manner in which archeologists categorize them. That is, the morphological characteristics that are the basis of archeological classification may be entirely insignificant to the prehistoric makers of the same artifacts. Nonetheless, morphologically consistent and recognizable groupings of projectile points can be identified in the archeological record. Groupings of morphologically similar artifacts reflect subconscious or conscious compilations of traits rather than random haphazard creations.

An entirely random association of traits added to each projectile point newly made by each flint knapper would lead to a projectile point assemblage where no two specimens were alike and each specimen would possess distinct formal and performance characteristics. Instead of projectile point collections consisting of a random compilations of traits, archeological assemblages consist of a finite number of morphological forms often represented by multiple specimens. The manufacture of given classes of artifacts by a craftsman or group of craftsmen is the product of the conscious or subconscious amalgamation of traits. While theoretically an infinite number of combinations of traits could be brought together to create a projectile point, assemblages tend to be characterized by a small number of traits that are repeated by individual craftsmen and groups of craftsmen. These morphological clusters are the technological reproductions of a constellation of traits either learned or copied from other individuals or sub-groups within one's community or communities with shared interactions. The groups could consist of commonly trained informal groupings (cohabitating group that learns from each other) of or more formal groupings such as guilds or technical schools.

No skills or crafts are learned or practiced in a vacuum. Within contexts lacking craft specialization, as was likely the case among the hunter-gatherers of South Texas, technological skills would have been learned from peers, parents, or members of the older generation. Depending on variable cultural transmission mechanisms (i.e., parent to child, inter-generational, master to apprentice, peer to peer [Hosfield 2009]), kinship systems, marriage practices. (Bowser and Patton 2008), and many other social factors (Stark et al. 2008), formal variability at the intra-community level (i.e., between craftsmen) may be moderately low or high but over time, as information sharing increases, morphological variability will tend to decrease, other factors notwithstanding.

On the other hand, at the inter-community level formal variability may be relatively high, if social distances between communities are high (Boyd and Richerson 1988). As members of distinct communities interact, the formal variability in the class of artifacts tends to be reduced, coalescing into a morphologically similar (i.e., statistically tighter cluster) class that reflects the levels of interaction or selection of formal characteristics that lead to an artifact that possesses satisfactory performance characteristics.

The more isolated communities remain, the more intra-community variability will decrease, while inter-community variability increases. New variability may be introduced as a result of idiosyncratic or experience-driven adjustments of traits. Some of these changes may or may not have performance implications. These processes in general tend to lead to a narrowing of morphological variability over time, either because artifacts tend to reach functional ideals or because information sharing continually improves over time. In other words, over time, form tends to become more standardized and if communities remain isolated, inter-community formal variability will be maintained and groups of artifacts manufactured by one group will be relatively distinct from those manufactured by another group. Therefore, a strong correlation should exist between artifacts and given communities of people or craftsmen. This correlation may not necessarily be intentionally fabricated and may not even be recognized internally, but it would be highly visible to outside groups.

Artifacts intentionally or unintentionally take on multiple dimensions or roles just as any cultural trait takes on new dimensions perhaps not even

intended in their original cultural context. Take for instance the bell-bottomed blue jeans of the 1960s. Bell-bottomed jeans, when first manufactured, represented a simple variation on a piece of clothing. Once adopted by a generation with a distinct social and cultural stance vis à vis the rest of society, the article of clothing came to represent an entire social movement. As these social trends made their way to Europe, after an appropriate time-lag, during the decade of the 1970s the trends in clothing were adopted across Eastern Europe. These trends, however, were devoid or at least much less connected with the socio-cultural message of the originating western culture, but instead were reduced to fashion trends. While a faction of society understood and highlighted the underlying symbolism of bell-bottomed jeans, namely the anti-establishment message, other were oblivious to it but wore them to convey yet an entirely different message, one signifying wealth and access. In short, an artifact of clothing that represented a given fashion style was adopted both as a fashion statement, a political statement, and a symbol of status among distinct groups depending on their own intentions. How does this example help to conceptualize the conundrum in projectile point types or variants identified earlier?

Projectile point types represent technologically produced morphologically similar clusters of artifacts. It is the capacity of the craftsmen to technologically reproduce a given form that allows archeologists to group the forms into types. However, whether a class of artifacts takes on symbolic roles and what specifically the symbolism attached to it may be is very much dependent on the social context within which it functions. Under certain broad social contexts, a single projectile point type or form may represent a single group of people, but such a conclusion is the least interesting of all possible conclusions. Understanding why and under what social circumstances human populations—ethnically distinct groups—adopt similar material culture, or under what circumstances they decide to distinguish themselves from others through material culture, is much more revealing, and contributes a great deal more about not only material culture, but its endless manipulations by prehistoric and historic groups for a variety of purposes.

Perhaps lithic technology is more limited than other forms of technologies (i.e., ceramic manufacture) in having the capacity to take on symbolic representations. Certain characteristics of ceramics, such as decorative elements, can be borrowed and added to existing forms to create hybrids (Card 2013). Mixtures of design motifs in turn can be used to signal a broad range of social meanings without necessarily affecting the functional properties of the artifact. Hybridization within projectile points may be more difficult to achieve because modifications of traits may indeed affect the performance characteristics of the artifact. One approach to hybridization may be related to an increase or decrease in point size. However, even such morphological change has functional repercussions that may reverberate through the compound weapons system, resulting in down-the-line modification that may in turn implicate performance characteristics (i.e., flight characteristics, penetration capacity, or failure potential).

Given this limitation of the artifact class, rarely do we identify projectile point forms that clearly reflect the borrowing and fusing of formal characteristics of existing types. The limited potential of this artifact class to illustrate mixes of formal variables (i.e., hybridity) also limits the capacity of the artifact class to reflect dramatic changes in the identity of the people who manufactured and possessed them. For instance, the often cited battleship-shaped frequency diagrams of projectile point type distributions do not start with the emergence of a new type from a previous type nor do they end with the morphological transformation of one type into another (Lyman et al. 1997:144-149). New forms of projectile points appear seemingly as unprecedented forms and disappear without trace. This, however, does not mean that the human groups that manufactured a give form appeared out of nowhere and disappeared into nowhere. This impression of history is derived simply from the fact that as people come into contact with new groups of humans manufacturing a different projectile point form, they will not attempt to borrow elements of the new form to combine with their existing weaponry. Rather, the new form is adopted in its entirety, seemingly appearing as if the adopting people disappeared without a trace.

Viewing the Guerrero variants discussed above as distinct types manufactured by different populations across northeastern Mexico, South Texas, and the coastal plains provides a new perspective on population interactions across this broad interconnected region during the Spanish Colonial period. Beginning by the mid-sixteenth century and picking up steam during the early eighteenth century, Spanish settlements and colonists

and Apache and Comanche groups from the north, inflicted significant pressures on indigenous groups of northern Mexico. As a result of these pressures, some indigenous group were territorially displaced. Other indigenous groups sought to build alliances to protect themselves and counteract the influence of Apache and Comanche groups. Yet others built extensive social networks with distant groups to allow them access to resources such as bison that were present in large numbers north of the Rio Grande. The fact that specific arrow point forms present across this region do not relate to specific cultural entities or cross-cut them is most informative perhaps of the fluid nature of the inter-relationships between groups that had interacted little prior to the Spanish Colonial upheaval. It may also be a reflection of the flexible nature of indigenous cultures to forge new social relationships in the face of the dramatic changes that were on their way.

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The Clear Creek Site (41BW698), an Early 19th Century Settlement in the Red River Valley, Bowie County, Texas

Timothy K. Perttula, Bob D. Skiles, and Bo Nelson

Archeological test investigations, along with supporting archival and historical research, at the Clear Creek site (41BW698) in Bowie County, Texas, were conducted in January 2012 prior to the development by Texas A&M University-Texarkana of a sports complex on campus. The archeological investigations focused on an historic component attributed to an 1836-1840 settlement by the Josiah W. Fort family. The test excavations of the Josiah W. Fort component identified intact deposits that covered a maximum 68 x 40 m area. The main occupational remains associated with the Josiah W. Fort family are concentrated within a smaller (36 x 20 m) archeological deposit that includes a yard sheet midden, two large pit features (> 1 m in diameter and between 40-80 cm bs in depth) in the sheet midden, a dense concentration of large burned clay pieces from a dismantled/destroyed mudcat chimney, and two discrete clusters of material culture remains, primarily comprised of transfer-printed ceramic sherds and cut nails. The nature of the archeological deposits indicates that the sheet midden accumulated not far to the west of a house structure (the original structure built by the Fort family in 1836), likely a double pen log cabin with wood framing and a mudcat chimney (apparently framed with pine wood and sticks).

The Clear Creek site (41BW698) is situated in the Red River valley in the Northeast Texas Pineywoods. Clear Creek, a small tributary to McKinney Bayou (filling an old Red River channel), runs southeast to northwest through the project area (including a section now inundated by Bringle Lake), and then enters the wide Red River floodplain (Figure 1). The site is in gently rolling uplands, and lies between 310-350 feet amsl elevation.

The Clear Creek site was recorded by Perttula and Nelson (2005:14-24) as primarily a ca. 1830s-1850s historic site with trash midden deposits, but there was also evidence of a possible early 20th century sawmill at the southern part of the site, as well as a prehistoric component of unknown age marked by low densities of lithic debris. The landform has been timbered in the past (but prior to 1995), and it had been recently (early 2011) timbered. Developments began encroaching on the site area after 2005, with nearby private housing subdivisions to the north, followed by extensive land-clearing associated with road and sewer line developments in 2011. Test excavations of the site were completed in 2012 (Perttula et al. 2012).

Historical Setting

The Bowie County area was settled by Anglo-Americans by the early 1820s. These "planters and plain folks" (Lowe and Campbell 1987) settled this part of the Red River valley, devoting considerable attention to the cultivation of cotton on both small farms and larger plantations (Strickland 1937). Settlements grew with the ready availability of fertile and inexpensive agricultural land, and Bowie County was created in 1840 as part of the Republic of Texas (Harper 1996). By 1850, there were 20,000 people living in northeastern Texas, about 3,000 in Bowie County alone, including a large proportion of slaves: slaves outnumbered whites 1,641 to 1,271 (Harper 1996:671).

The Clear Creek site is on land that was patented to Josiah W. Fort on October 10, 1844. He received a Bowie 2nd Class land grant (Texas General Land Office 1941:6) of 1280 acres (some 300 acres of which comprise the majority of the eastern two-thirds of the Texas A&M University-Texarkana campus) because he was the head of a family who had immigrated to the Republic of Texas after the 1836 Texas Declaration of Independence and

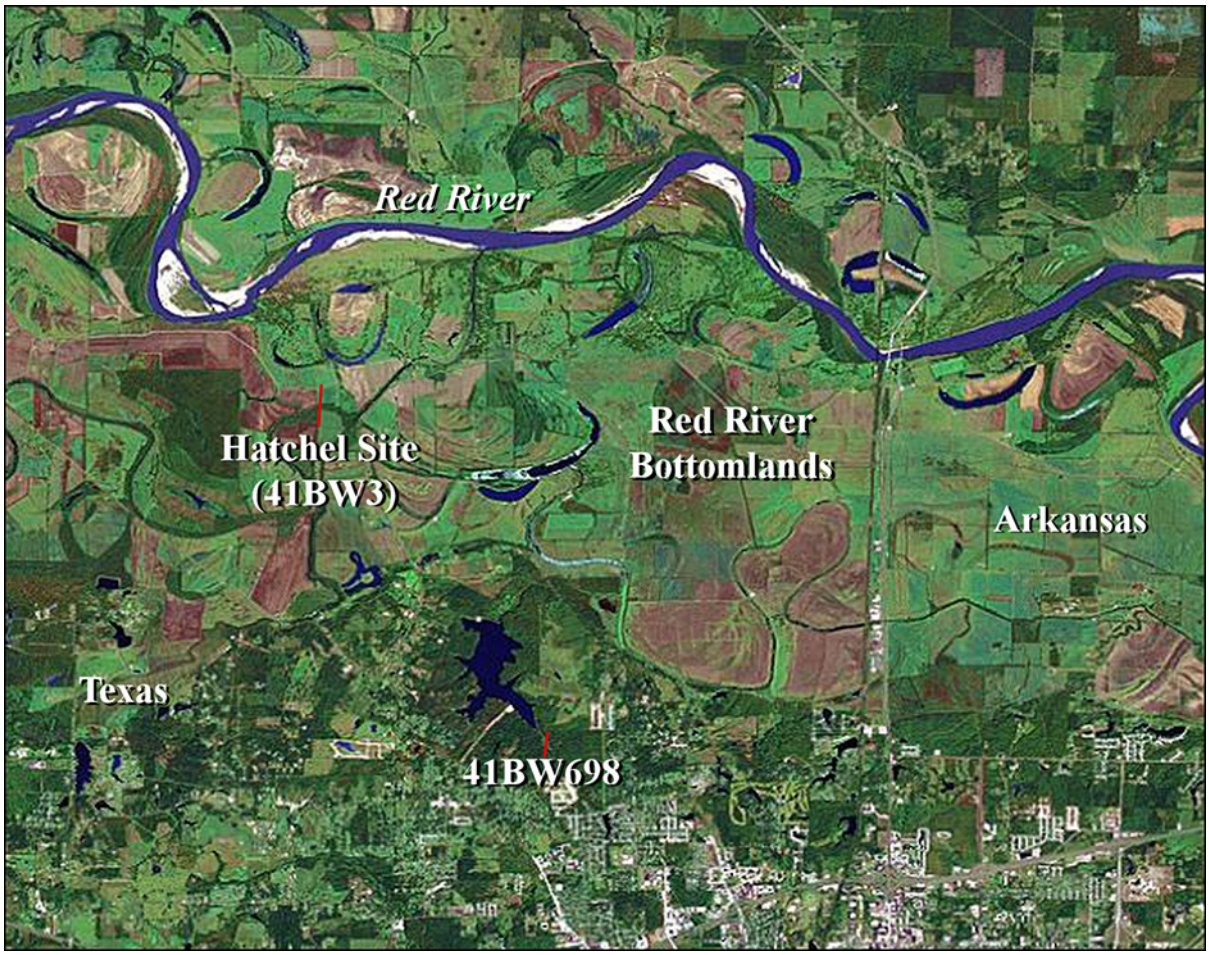

Figure 1. Aerial photograph showing the location of the Clear Creek site (41BW698), the Hatchel site (41BW3), Red River bottomlands in Texas and Arkansas, and the current channel of the Red River.

before October 1, 1837. Among the legal requirements to be met for his land grant were that he had to remain in the republic for three years after settling there, and also "performed the duties of citizenship" (Lang and Long 1996:57). According to the 1850 Bowie County census, Josiah was 55 years of age, and had come from Tennessee; his occupation was listed as a planter, with a net worth of $24,000. His real and personal wealth holdings were well above the mean value of agricultural farmers in northeastern Texas in 1850 (see Lowe and Campbell 1987:Table 14).

His household included his wife, Deanna (53 years of age); a son Joseph W. (22 years of age); Robert Killingsworth, an overseer who had come from North Carolina; an Ann Fort, also 22 years old, and perhaps a daughter of Josiah's or wife to Joseph W. Fort; a farmer, Sam Burnside; and John Miliken, a carpenter. The 1850 census also recorded that William Fort (another son), 24 years of age, and from Tennessee, lived on the property, with his wife Mary G., and daughter Mary C., born in Texas in 1849.

It was considered possible when our investigations began that the Clear Creek site represented one of the original 1840s-1850 Fort households on Josiah W. Fort landholdings, although it was far from certain if it was the household of the father or one of his sons. The site certainly dated to the appropriate time period, as artifacts had been recovered in the archeological survey that would have been in common use in the 1840s and 1850s, when it has been established that the Fort households were living on the property.

Archival and historical research has established that the Clear Creek site (41BW698) represents the

original 1836-1840 homestead in Texas of Josiah W. Fort and his family. The Clear Creek site is located on the western portion of the Josiah W. Fort Survey (A-218), which was an original Texas headright land survey. This land was still part of Red River County, lying in the vast and largely unsettled and vacant domain between Fulton (in the State of Arkansas) and Jonesboro (in the Republic of Texas), when Fort first arrived in Texas. Having arrived in the Republic after the Revolution, on 28 November 1836, and as a married man, Fort was entitled to an unconditional 2nd-class certificate for 1280 acres, which was issued by the Board of Land Commissioners of Red River County on 7 February 1839.

Josiah W. Fort was a descendant of several old Virginian families who had come to America in the mid-1600s from England. They were not frontiersmen, but frontier-followers who, soon after rich new frontier lands were securely wrested from their former Native American owners who were banished from the region, bore Anglo-American cultural mores, the Baptist faith, and large numbers of slaves forward to settlements established safely behind the new frontiers. They acquired large tracts of land from already established small farmers. In doing so, they transformed the agrarian landscapes and economies of the frontier from that of small farms—owned and worked by non-slaveholding poor and yeoman white families that were focused largely on subsistence farming with production of a money crop being of secondary importance—to one of large plantations owned by a genteel class of white planters. These white planters primarily focused on production of money crops such as indigo, tobacco, and cotton, on new lands cleared and worked by large numbers of negro slaves.

Through the generations, they tended to acquire the richest lands that had formerly been the location of Indian towns, intermarried with cousins from the same small number of families (e.g., Forts and Battles), and quickly established family-kin culture areas (and Baptist churches and associations of Baptist churches) in newly colonized areas. They followed this pattern throughout five or six generations in migrating from Virginia, to the Tar River valley of North Carolina, to the Red River valley of Tennessee, to western Tennessee, to Mississippi, and on to the Red River valley of Arkansas and Texas in the 1830s (Figure 2).

In a newspaper article in 1923, a granddaughter of Josiah W. Fort (Mrs. Miriam Fort Gill) wrote a detailed account of the Fort family's move to Texas in 1836 to his 1280 acre headright and the frontier conditions of the area they settled:

> In the spring of 1836, shortly after the battle of San Jacinto, my grandfather, Dr. Josiah W. Fort came to Texas on a prospecting trip, and coming overland from Tennessee naturally came into Texas at the northeast corner. Finding timber, springs,

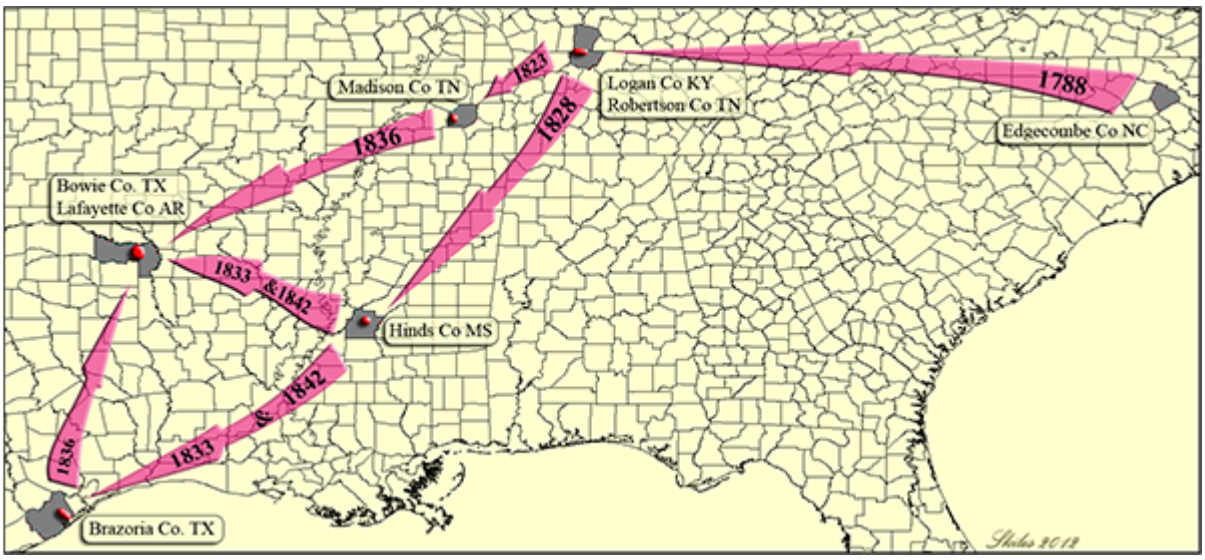

Figure 2. Migration of Fort families across the Southeastern United States to Texas.

> and small open prairies he thought this a similar country to the rich "barren lands" of Kentucky and Tennessee, and fearing the Indians farther west he stopped here. He secured a survey of land lying just one and one-half miles north of this city [Texarkana] and later located the tract as his headright.
>
> In November of the same year he brought his wife and seven children, a young lady friend of the family and forty slaves from Tennessee to Texas, traveling by carryall, wagon, and horseback, the older girls through preference riding horseback all the way. For days they traveled along with or in the wake of Indians whom the United States was moving from Alabama, Mississippi, and Georgia to the Indian territory. The family was six weeks on the way (Gill 1923).

Mrs. Gill also described the house, apparently a typical Upland South dogtrot (i.e., a log cabin with two rooms and a covered breezeway or "dogtrot" between the two rooms, see Campbell 2003:217), that her grandfather had built for the family, and the cabins for the slaves, as well as providing information on the family's need to adapt native materials to supply essential articles on this frontier, far from any market:

> The first winter my grandfather spent in housing his family and clearing land for the next year's crops. For his family he built a house of hewn logs, two large rooms with a wide open hall between and a stick and dirt chimney at each end. The negroes had one-room [log] cabins for each family. The two-room log house was the common settler's home [double-pen dogtrot] and cost not exceeding twenty dollars. As a general thing it cost nothing, the settlers gathering for a "house raising," a common manifestation of good will and helpfulness.
>
> This primitive house contained only the bare necessities of living, for no furniture excepting beds and chairs could be brought over the long rough road from Tennessee. In it my grandmother, like many other pioneer women in similar houses, carried on the great business of homemaking, feeding, and clothing the family of fifty, white and black. She spun cotton and woolen yarns, colored them with dyes made from berries, roots, and bark, wove the cloth on a home-made loom, cut and made by hand every garment, and with the assistance of her daughters knitted all the socks and stockings for the big family. Food for a family of that size was a problem then. There was an abundance of game, but no fruit or vegetables the first year, although garden seeds had been brought from Tennessee. There was no coffee, no sugar, and for three years there was no flour on the table. There was no grist mill in that section and corn was ground into mill in a steel mill fastened to a tree, taking two negro men a whole day to grind a week's supply.
>
> Candles were made by dipping a cotton wick again and again in melted tallow, an iron lamp of primitive Greek pattern, with a cotton wick floating in grease, was used in the kitchen and smoke-house, and lightwood knots supplied the cabins with lights.
>
> There was no blacksmith shop nearer than twenty-five miles to mend a broken chair or plowshare, and there was not a crossroad store in all the country. The nearest post office was at Washington, Arkansas, and a negro was sent once a month for the mail.

The arrival of Josiah W. Fort on the Red River in 1836 signaled the end of the frontier era in the northeastern part of the Republic of Texas. It also signaled the arrival of the vanguard of a new Upland South planter culture that would take possession of the best lands from the frontiersmen and pioneer settlers, establishing themselves and their Baptist faith, well before the arrival of their Lowland South cousins from Mississippi in 1842. After that point in time, together they once again melded through intermarriage and forged a new family-kin culture area of large-slaveholding cotton-planter families in the Myrtle Springs community in Bowie County, Texas (Figure 3). Josiah W. Fort moved from his original homeplace on the Fort Survey after only three years, and built a new home at Myrtle Springs a few miles to the

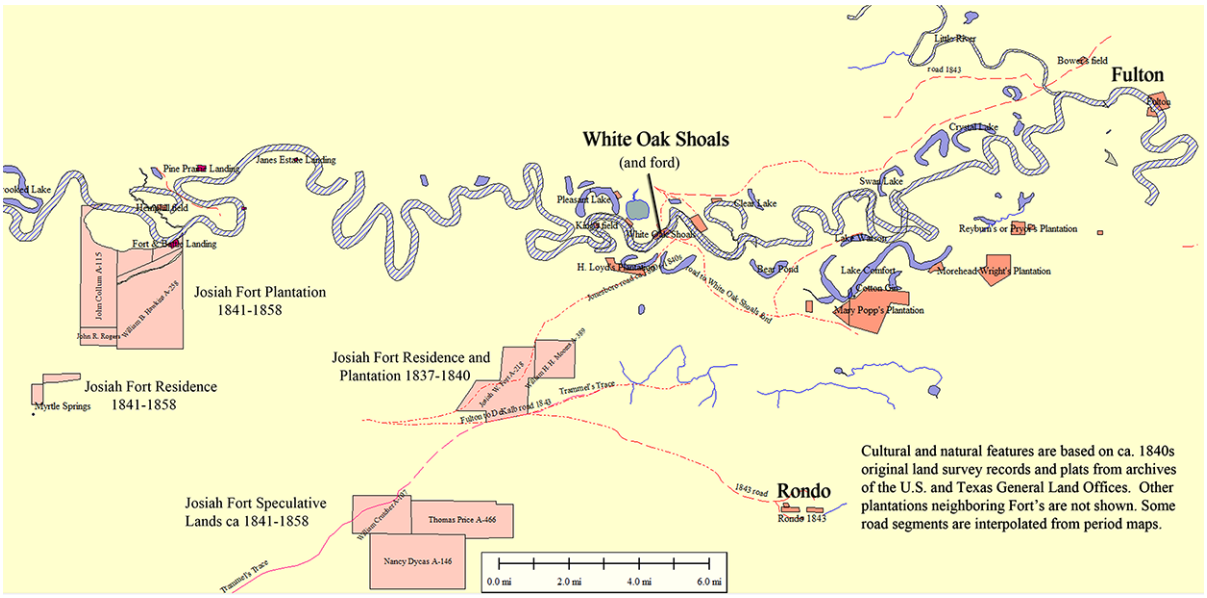

Figure 3. Cultural and natural landscape in the area of Josiah W. Fort's plantations about 1837-1858.

west of his original headright lands. Fort acquired a tract of land on which he, and other family members, and other rich planters (e.g., Col. Charles Lewis and the Hooks family) built fashionable and healthy new homes, far removed from the "sickly"bottomlands of the river.

After establishing their homestead on their original headright lands of 1280 acres in November 1836 at the Clear Creek site, bringing 40 slaves with them, by the early 1840s the Fort family had continued to prosper, firmly establishing a large and substantial plantation (mainly in the Red River bottomlands and with their own steamboat landing on the river) a few miles west of their headright lands. The plantation primarily focused on the production of money crops such as cotton on new lands cleared and worked by large numbers of negro slaves, as attested to by Bowie County tax roll information. The tax rolls further indicated that Josiah W. Fort, and his several sons, were large slave owners. The slaves were used on the Fort land holdings primarily for the cultivation and harvesting of cotton on Red River bottomlands; other slaves who had special training or skills (i.e., blacksmiths or brick masons) did not work as field laborers (Campbell 2003:221). As mentioned above, Josiah W. Fort brought 40 slaves with him when he and his family moved from Tennessee in the fall of 1836, and he increased his slave holdings every year. At the time of his death in September 1858, he owned 62 slaves, while his sons owned another 46 slaves. In 1860, Bowie County was one of a number of counties in Texas that had more than 1,000 slaves, and slaves in the county accounted for more than 50 percent of the population (Campbell 2003:222). The population of Bowie County in 1860 was 5,052 (Bagur 2012:222).

After that point in time, the Fort Family and their relatives melded through intermarriage and forged a new family-kin culture area of wealthy, and large, slaveholding cotton-planter families in the Myrtle Springs community in Bowie County, Texas. By that time, Josiah W. Fort had settled on the land, establishing a large cotton plantation, together with some of the black slaves he had brought with him from Tennessee. That Fort had established himself as a notable cotton planter by 1852 is attested by an article in the *Northern Standard* on March 6th of that year stating that:

> [Bowie County] Dr. J. W. Fort, made on one field of 72 acres, 111 bales of cotton, and of corn, 2750 bushels – On his entire plantation, with 20 hands, made 200 bales cotton, weighing 500 pds [pounds] each.

The Forts did hold onto title to their original headright lands, the location of the Clear Creek site, from 1836 to 1885, throughout the turmoil of the Civil War and Reconstruction, but it does not appear to have been occupied by the family after 1840.

Archeological Investigations

The focus of the archeological investigations at the Clear Creek site was to fully comprehend the character of this singular mid-19th century rural site and its relationship to family life in the Texarkana area. We attempted to accomplish this through a careful consideration of the material remains and features found in test excavations at the site. The material remains of interest included (1) the houses, barns, and other features that may be expected and present; (2) the range of artifacts used in the context of everyday life; and (3) the use of space and landscapes by a farming family and household, particularly the intra-site use of yard space. We thought that the recovery of archeological material remains in these three areas would contribute new information regarding economic conditions, social relationships, and the material life of farm-owning households and plantations during this specific period of time in this specific part of Texas. This is the time when cotton cultivation was "King Cotton" in East Texas (Calvert 1970).

The archeological work at the Clear Creek site during the test excavations consisted of 63 shovel tests, 20 1 x 1 m hand excavated units, a 40 x 40 cm fine screen column adjacent to Unit 5 and Feature 1, and four backhoe scrapes (Scrapes 1-4, totaling 62.9 m^2) (Figure 4). These investigations have showed that the Clear Creek site contains intact archeological deposits from three different occupations: (1) an ancestral Caddo occupation; (2) a ca. 1836-1840 occupation on the northern part of the remaining site area, covering a ca. 4000 m^2 area; and (3) a ca. 1885-1909 occupation (Lucinda Paxton farm) about twice the size at the southern part of the site; this occupation included the remains of a sawmill set (Perttula et al. 2012).

The main occupation is the ca. 1836-1840 occupation by Josiah W. Fort and his family. He and his family had moved from Tennessee to a 1280 acre claim on Clear Creek, and he established his homestead on the east side of Clear Creek, just north of Trammel's Trace. Beginning in 1840, Fort purchased other lands in the Myrtle Springs area, a few miles west of Clear Creek, and established his cotton plantation on rich Red River alluvial soils. His family remained there through the Civil War. His original homestead was apparently abandoned in 1840, although the land was held by the Fort estate until 1885.

Archeological investigations in the Josiah W. Fort occupation area indicate that there are preserved occupational features and deposits in the northern part of the Clear Creek site, namely evidence (from cut nails, a few pieces of thin window glass, and burned clay from a mudcat chimney and wall chinking) that a wood structure (i.e., a log cabin) stood on the site, probably a structure that stood on wood piers. The exact location of the wood structure has not been determined from the test excavations. There is a preserved sheet midden that is evidence of outdoor work and yard activities (including trash disposal), and two large (>1 m in diameter) pit features (Features 1 and 2) that may have been used as part of yard activities (i.e., making soap, processing of organic remains, and trash disposal). This area has well-preserved animal bones and charred plant remains, as well as plain and decorated pearlware and whiteware ceramics, bottle glass and window glass, a few glass beads and metal buttons, silver utensil fragments, cut nails, gun parts, lead balls, gunflints, and lead sprue from making bullets on site, cast iron kettle fragments, and substantial quantities of burned clay from the remnants of a clay mudcat chimney and other structural features exposed to fire.

The main concentration of 1836-1840 artifacts was in the southwestern part of the remaining site area, adjacent to a shallowly buried sheet midden deposit (Figure 5). Nineteen 1 x 1 m units were excavated in the main historic archeological component at the Clear Creek site. The majority of the units were concentrated in a 22 x 30 m area in and adjacent to the sheet midden area marked by darkly stained sandy loam sediments; these sediments had been previously encountered in several shovel tests and they were also visible in patches of bare or scraped ground.

In addition to sheet midden deposits, two pit features were identified in the 1836-1840 archeological deposits within the main component area at the Clear Creek site: Feature 1 in Unit 5 and SS 64 (a 40 x 40 cm fine screen column) and Feature 2 in Unit 15 (see Figure 5). Both pit features are located in the sheet midden area.

Feature 1 is a large pit feature filled with abundant burned clay pieces, charcoal, animal bone, and a limited variety of historic artifacts (mainly ceramic sherds and cut nails). Based on Feature 1 deposits in ST 25, Unit 5, and SS 64, the pit is at least 1.6 m east-west and 75 cm north-south, but its total dimensions are unknown. The curvature of the pit at 70 cm bs suggests the pit could easily be 3 m in diameter.

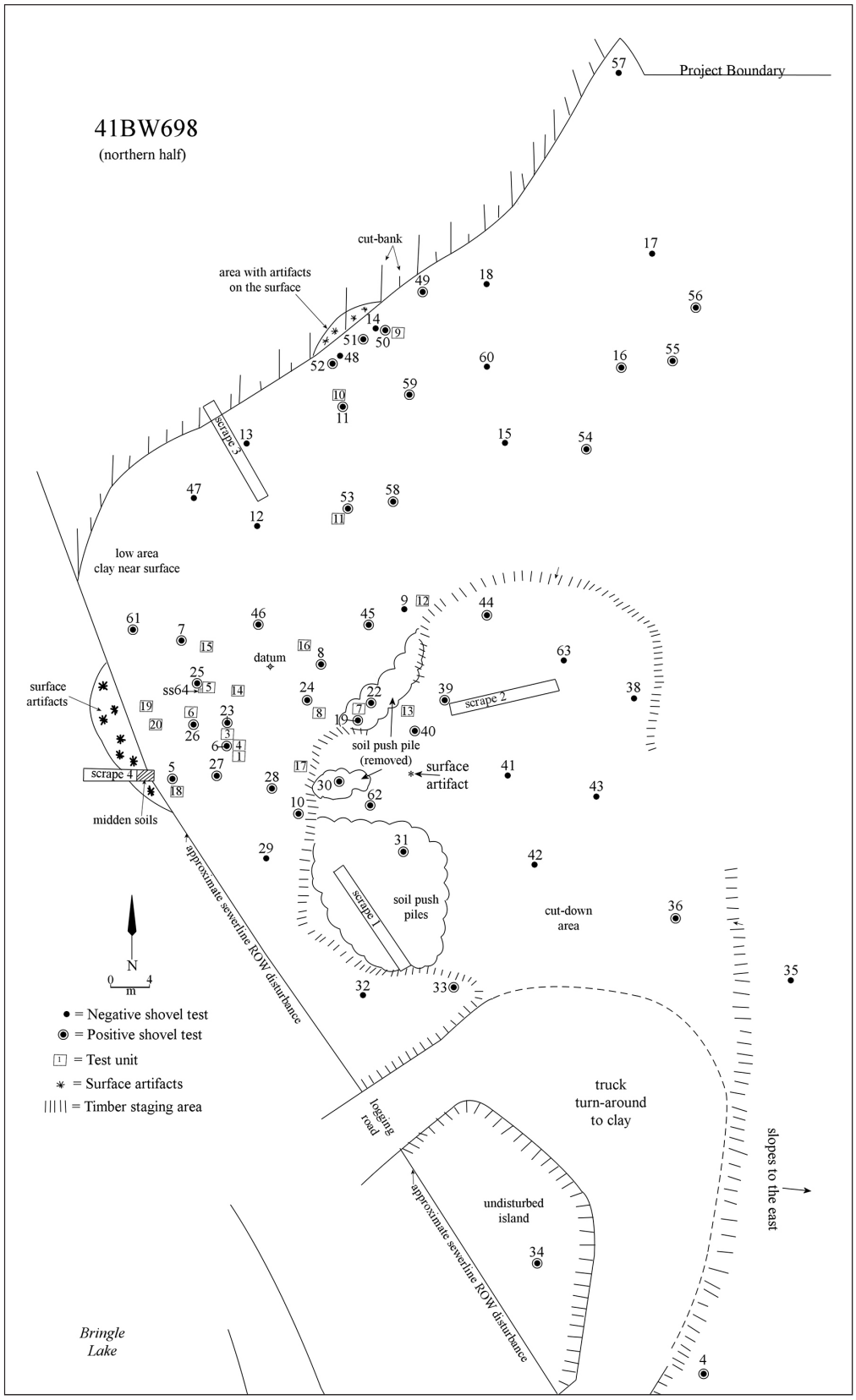

Figure 4. Close-up of the northern part of the Clear Creek site, showing surface artifact concentrations, shovel tests, hand-excavated units, and Scrapes 1-4.

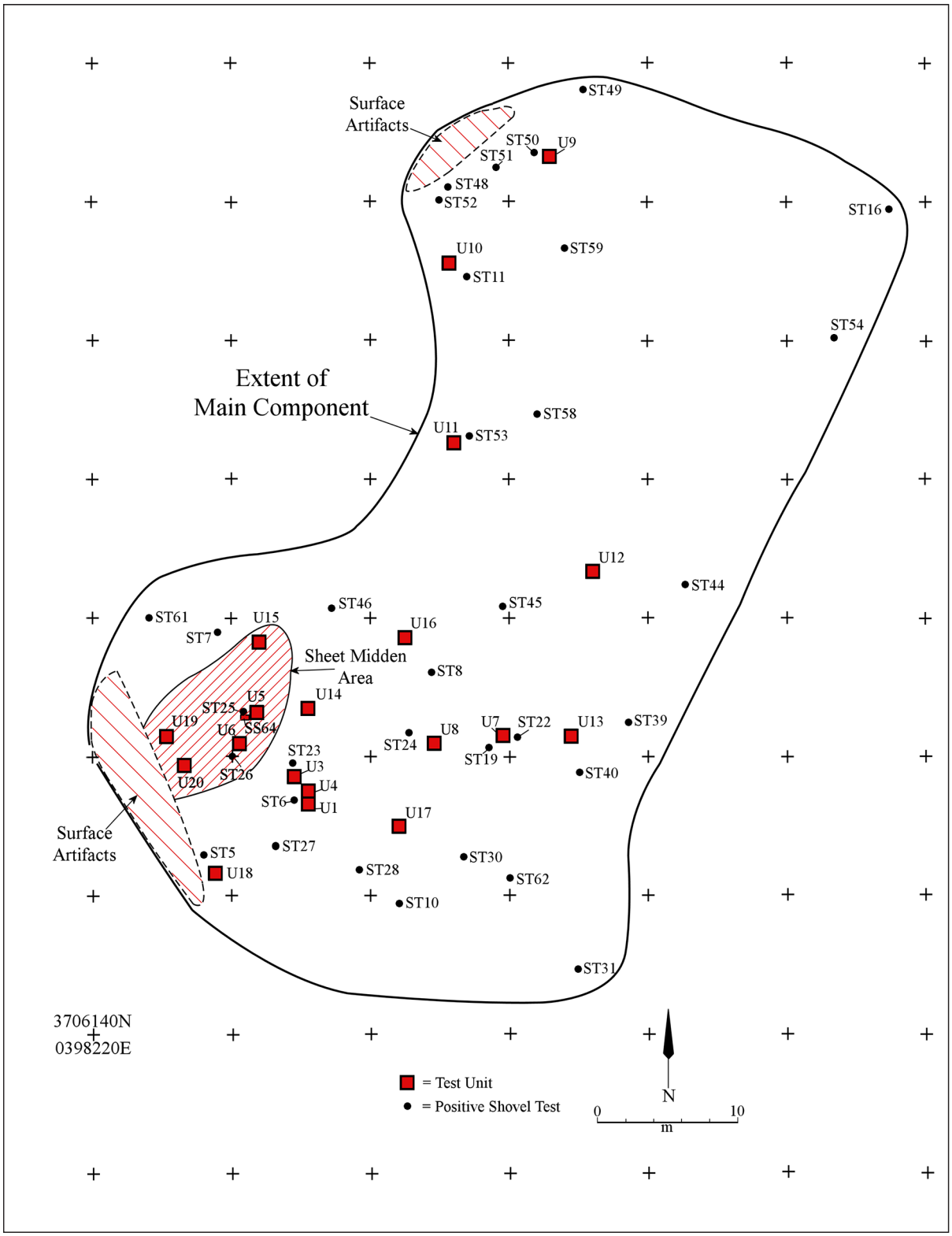

Figure 5. Location of positive shovel tests and 1 x 1 m units in the main historic archeological component at the Clear Creek site.

The pit originates immediately below the Zone 1 sheet midden deposits, a ca. 15 cm thick very dark grayish-brown sandy loam (Figure 6a-b). The bottom of the pit, which has sloping walls and a rounded base, extends to 80 cm bs, cutting 45 cm into the red clay B-horizon (Zone 5).

Feature 1 has several fill zones, the principal zone (35-50 cm thick) being a mixture of linear streaks of dark grayish-brown, brown, and grayish-brown sandy loam sediments (Zone 2); burned clay from a probable mudcat chimney is abundant in this zone (see Figure 6b). The lowermost fill zones, and

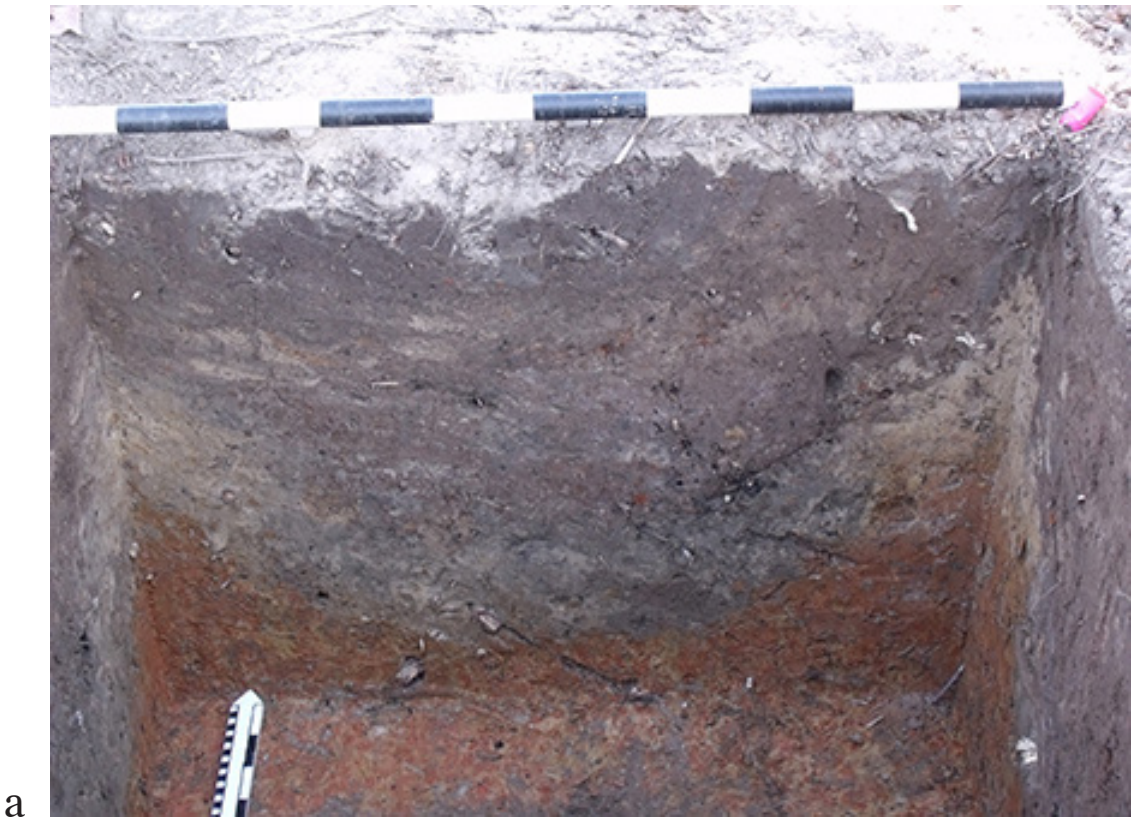

Figure 6. Feature 1 profile, Unit 5: a, north and east walls; b, north and west walls.

initial feature fill deposits, include Zone 9, a mix of dark grayish-brown and yellowish-brown sandy loam; Zone 8 (grayish-brown sandy loam with ashy gray streaks); Zone 7, a grayish-brown sandy loam and ash lens; Zone 4 (dark grayish-brown sandy loam with yellowish-brown mottles); and Zone 6 (grayish-brown sandy loam with burned clay pieces and charcoal). The ashy Zone 7 and Zone 8 probably originated from fire place sweepings that were discarded in the pit feature. Along the margins of the pit feature is Zone 3, yellowish-brown sandy loam remnants of the E-horizon deposits exposed in the northern part of Unit 5 (see Figure 6b).

Feature 2 is a large pit feature that measures at least 1 m north-south and 70 cm east-west, but its total dimensions are unknown; based on the curvature of the pit at 30 cm bs, it is suspected that the pit is at least 2 m in diameter. The pit appears to originate at ca. 18 cm bs and extends to 40 cm bs; the pit walls have cut through a yellowish-brown sandy loam E-horizon (Zone 3) and extend into the red clay B-horizon (Zone 4) about 11 cm, leaving a relatively flat pit floor. The pit fill is a brown (10YR 4/3) sandy loam with charcoal flecking.

The artifacts from the 1836-1840 Josiah W. Fort component at the Clear Creek site represent the low density accumulation of discarded and broken domestic and architectural artifacts from the short occupation by Josiah W. Fort and his family before they moved and took up residence in the Myrtle Springs area. A total of 826 historic artifacts (not including the 7700+ burned clay pieces) have been found across various contexts in archeological deposits of the Josiah W. Fort component (Table 1).

In the shovel testing work, the highest densities of artifacts are in ST 6, ST 23, and ST 25, shovel tests either in or immediately adjacent to the sheet midden deposit (see Figure 5). In hand-excavated units (Units 1, 3-20), the mean artifact density is 36.2 artifacts per 1 x 1 m unit, with a range of 1-233. The highest densities of artifacts (>30 artifacts per 1 x 1 m unit) are in Unit 5, Unit 6, Unit 19, and SS 64 in sheet midden deposits, and in Unit 7 approximately 15 m east of the eastern extent of the sheet midden (see Figure 5). The sheet midden artifact cluster has densities greater than 30-38 artifacts per m^2, while the eastern artifact cluster (with Units 7, 8, 13, and 16) has densities of greater than 17 artifacts per m^2 (Figure 7a).

Transfer-printed refined earthenwares, stoneware sherds, and Redware sherds are concentrated in the sheet midden deposits, or in hand-excavated units just south of the sheet midden. The cut nails were found in two clusters; the sheet midden in the western part of the component, and an eastern and slightly elevated cluster 5-10 m to the east. The few window glass sherds have the same distribution. The many burned clay pieces are concentrated in sheet midden deposits, and occur primarily in Unit 5 and SS 64.

Taken together with the feature data, these various spatial distributions of artifacts in the 1836-1840 Josiah W. Fort component suggest the following:

- the main part of the Josiah W. Fort component, that area with the highest densities of discarded artifacts, covered only a ca. 34 x 16 m area;
- the majority of broken and discarded artifacts, as well as burned clay pieces, accumulated in a yard sheet midden. Pit features were also excavated in the yard, and were eventually and purposefully filled with trash, ash, and other residues of outdoor activities at the site;
- in addition to sheet midden deposits, the distribution of cut nails and window glass suggest that a second cluster of historic artifacts in the component probably represents the location of a wood structure built with nails and featuring one or two windows. This second cluster of artifacts is a few meters east of the sheet midden deposits.

From this information, it is possible to suggest where the Josiah W. Fort house structure stood on the site. We suggest it stood on a slighter elevated and flat part of the upland landform, in the area of Units 7, 8, and 13, just east of the sheet midden deposits on a sloping part of the landform (see Figure 7b). The structure was apparently a two-pen square or rectangular wood building or dog trot with a loft sleeping space (see Campbell 2003:214). The many pieces of burned clay in the midden deposits suggest that the structure included at least one mudcat chimney. To account for the massive amounts of burned clay in the eastern part of the sheet midden, we surmise that a mudcat chimney stood at the western side of the structure, closest to the yard sheet midden. The mudcat chimney did not appear to have a rock base, since no chimney foundation stones were identified in the test excavations.

Although we can offer speculations on the location of the Josiah W. Fort structure at the Clear Creek site, based on specific artifact distributional

Table 1. Horizontal distribution of artifacts from the 1836-1840 Josiah W. Fort component. Note that this does not include any artifacts from surface contexts or Scrapes 1-4.

Provenience	Ceramics	Bottle Glass*	Other Glass	Window Glass	Nails	Other Metal**	GF/ Bead/Slate	N
ST 5	2	-	-	-	-	-	-	2
ST 6	6	-	-	-	-	-	-	6
ST 7	1	-	-	-	-	-	-	1
ST 10	1	-	-	-	-	-	-	1
ST 19	2	-	-	-	1	-	-	3
ST 22	1	-	-	-	-	-	-	1
ST 23	4	-	-	-	-	-	1	5
ST 24	2	-	-	-	-	-	-	2
ST 25	10	3	1	-	3	1	-	18
ST 26	3	-	-	-	-	1	-	4
ST 27	1	-	-	-	-	-	-	1
ST 36	1	-	-	-	-	-	-	1
ST 46	1	-	-	-	-	-	-	1
ST 50	3	-	-	-	1	-	-	4
ST 51	-	-	-	-	-	1	-	1
ST 52	-	-	-	-	1	-	-	1
ST 53	1	-	-	-	1	-	-	2
ST 54	-	-	-	-	-	1	-	1
ST 55	-	-	-	-	-	1	-	1
ST 59	-	-	-	-	1	-	-	1
ST 61	-	1	-	-	1	-	-	2
ST 62	-	-	-	-	1	-	-	1
Subtotal	39	4	1	-	10	5	1	60
SS 64	17	10	-	1	15	1	-	44
Unit 1	20	4	-	1	5	1	-	31
Unit 3	35	8	1	-	2	5	-	51
Unit 4	21	3	1	-	6	1	-	32
Unit 5	101	50	2	2	59	13	6	233
Unit 6	27	9	-	3	8	-	-	47
Unit 7	15	3	-	-	26	3	1	48
Unit 8	10	1	-	1	12	-	-	24
Unit 9	3	-	-	-	-	-	-	3
Unit 10	1	-	-	-	-	-	-	1
Unit 11	4	1	-	-	-	-	-	5
Unit 12	1	-	-	-	-	-	-	1
Unit 13	3	1	-	1	11	-	1	17
Unit 14	11	3	1	1	14	-	-	30
Unit 15	18	3	-	-	14	1	-	36
Unit 16	7	-	-	-	10	-	-	17
Unit 17	1	1	-	-	3	-	-	5
Unit 18	7	1	-	-	4	-	-	12
Unit 19	31	8	2	-	15	1	-	57
Unit 20	13	6	-	-	17	2	-	38
Subtotal	329	102	7	9	206	27	8	688
Totals	385	116	8	10	231	33	9	792

ST=shovel test; SS=special sample; GF=gunflints; *tableware glass; pressed glass
**buttons, lead balls, lad sprue, brass purse handle, silver utensils, straight pins, cast iron pieces; iron loop; iron pin; iron screw; iron bracket; tacks; iron latch; thin iron strips

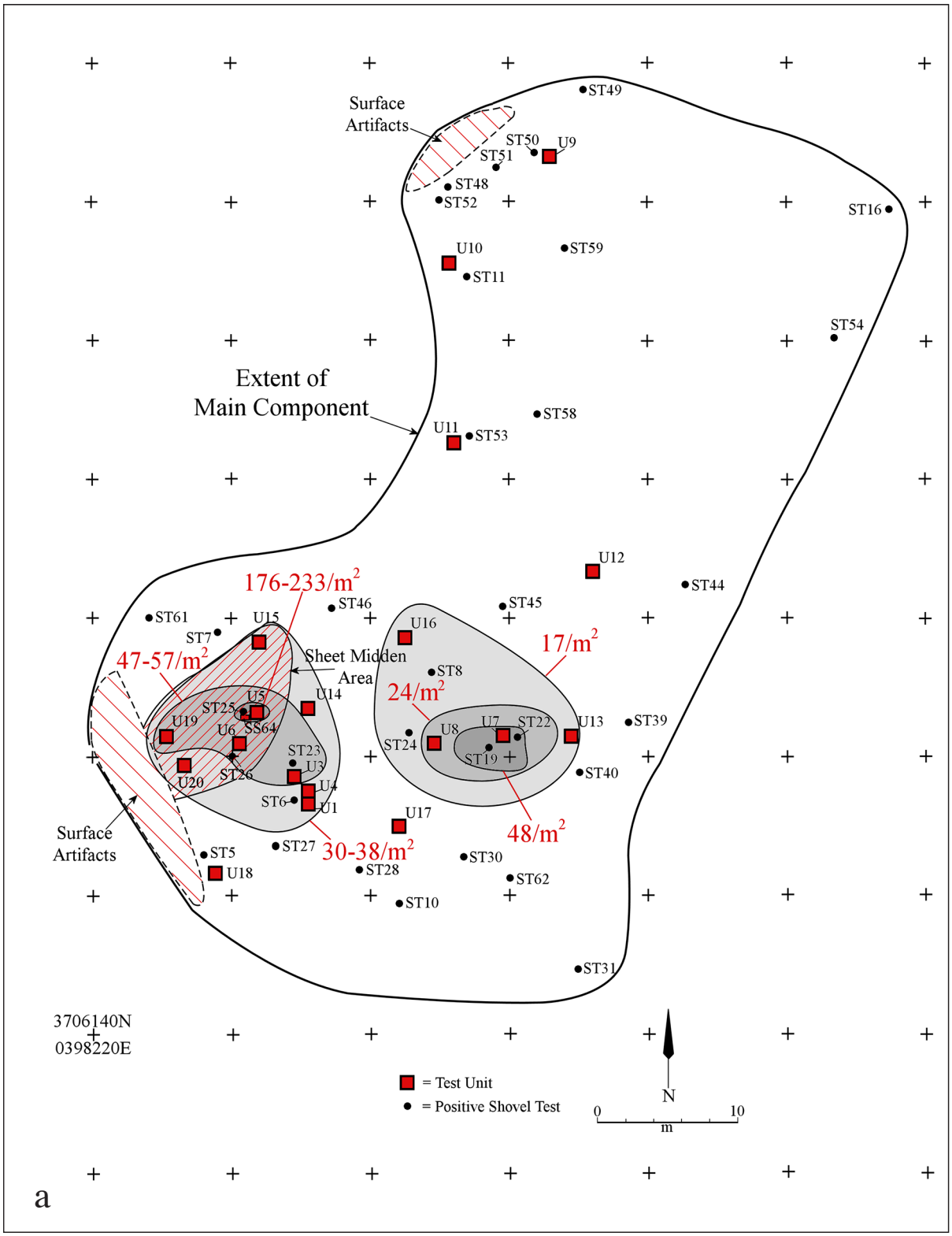

Figure 7a. Horizontal distribution of artifacts in the 1836-1840 Josiah W. Fort component: total historic artifacts.

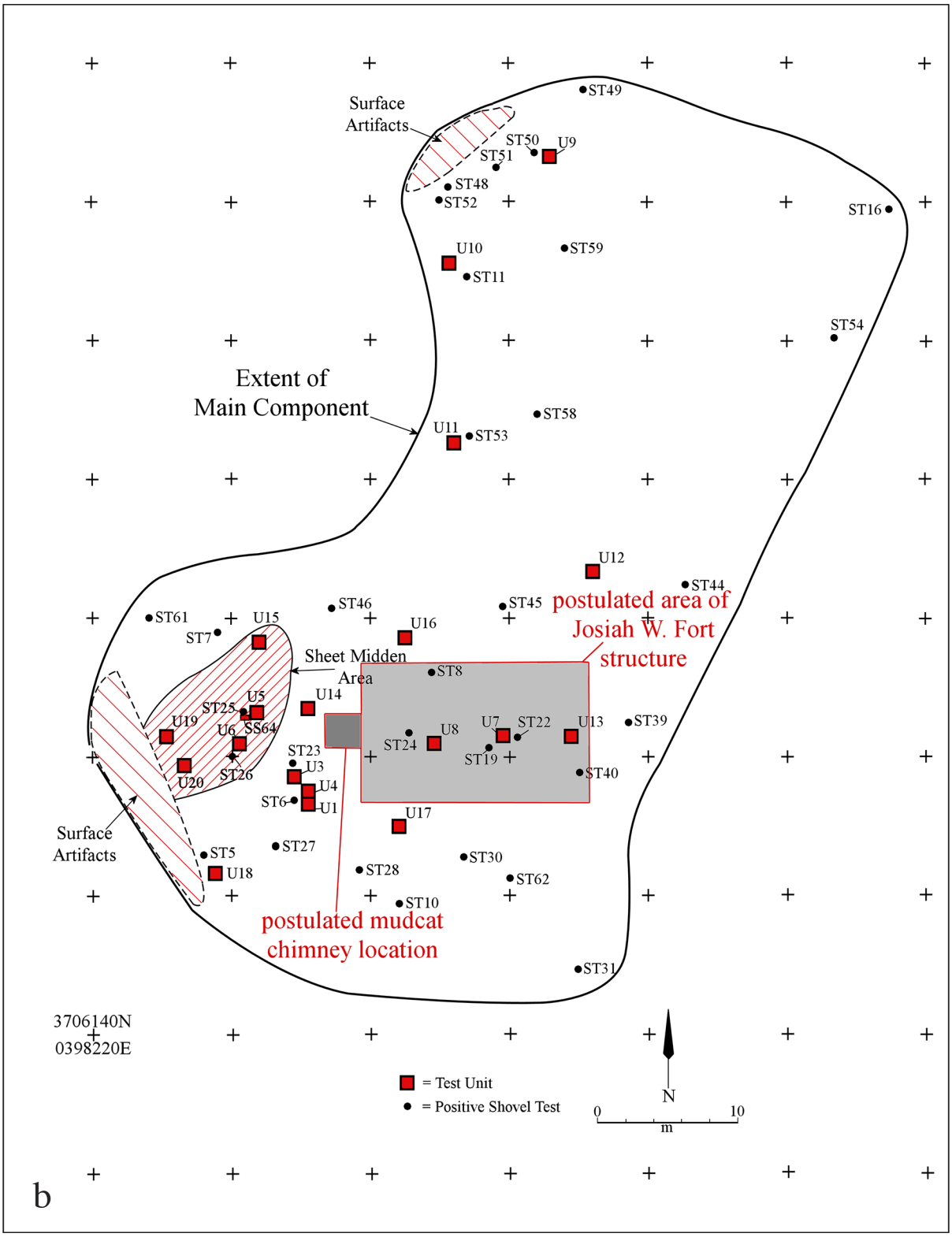

Figure 7b. Postulated area of the Josiah W. Fort structure and mudcat chimney.

data, we have no information to offer on the location of a possible outdoor kitchen (if one was present, see Campbell [2003:216]), the locations of slave quarters (which must have been built nearby, since Josiah W. Fort brought 40 slaves with him from Tennessee), or the direction the structure faced. At the time, the Jonesboro road was a short distance to the west of the site, while Trammel's Trace was a farther distance to the south (see Figure 3). It seems reasonable to suggest that the Josiah W. Fort house was sited in relationship to the Jonesboro road.

Material Culture Remains

The material culture remains recovered from the 1836-1840 Josiah W. Fort component are dominated by domestic and architectural items. Among the most common domestic items are refined earthenware plates, cups, and other vessel forms, along with a few sherds of stoneware and redware, as well as mainly small sherds from glass bottles and other glass items such as pressed glass or tableware sherds. Ceramic sherds account for 49 percent of the assemblage, and bottle glass another 15 percent; the other glass comprises only 1 percent of the assemblage. Architectural items include cut nails, a few window glass sherds, and quantities of burned clay pieces (see Table 1). Cut nails (and a few forged nails) represent 29 percent of the artifact assemblage, and window glass comprises 1.3 percent of the assemblage. The remainder of the Josiah W. Fort artifact assemblage includes other metal artifacts (i.e., buttons, lead balls, lad sprue, brass purse handle, silver utensils, straight pins, cast iron pieces; iron loop; iron pin; iron screw; iron bracket; tacks; iron latch; and thin iron strips)—these accounting for 4.2 percent—glass beads, shale pieces, and gunflints.

Refined Earthenwares and Porcelain

Refined earthenware and porcelain sherds comprise the fine-paste ceramic wares present in the Josiah W. Fort component. The refined earthenwares include pearlware and whiteware (Table 2), with the pearlware representing approximately 8 percent of the assemblage, and whitewares the remaining 92 percent. This low percentage of pearlware represented in the ceramic sherds is consistent with an historic occupation predating ca. 1850, while the proportion of decorated sherds (34 percent of the pearlware and 76 percent of the whiteware) is in temporal accord with an occupation predating 1840 (cf. Hunter 2004:Figures 110 and 111). In general, the kinds of decorations represented on the pearlware and whitewares at the site are also consistent with the 1836-1840 occupation determined through historical and archival investigations.

The pearlware sherds recovered in the Josiah W. Fort component include 22 plain body and base sherds, one sherd with an 1836 Davenport anchor impressed maker's mark (see Figure 17f, below), and 12 decorated sherds. These include three bold polychrome hand-painted rim and body sherds, two scalloped-impressed blue shell-edged rim sherds, and seven transfer-printed rim and body sherds. The transfer-printed sherds are blue (n=1), purple (n=3, see Figure 14d, below), black (n=2; see Figure 8i, below), and brown (n=1, see Figure 11g, below) colors.

The plain whiteware sherds are from plates, cups, and hollowware vessels, such as sugar bowls and lids to tea pots. The plain rims appear to be primarily from undecorated plates.

Five sherds of what has been identified as whiteware have an olive-green glaze on both sherd surfaces. It is possible that these sherds are not in fact from whiteware vessels, but are instead from what Hahn et al. (2010:133) terms "creamware/pearlware transitional pieces." Such transitional wares "have a more greenish glaze than typically found on creamware pieces, but not the greenish-blue of true pearlwares…these transitional wares… likely date from about 1780 to 1820." If these sherds are from transitional creamware/pearlware vessels, these vessels were likely heirlooms brought to Texas by the Fort family in 1836. These sherds are from four units (Units 3, 4, 15, and 19) placed in and around the sheet midden deposits (see Figure 5).

The porcelain sherds are plain body sherds (n=3). Single sherds have been recovered in Units 11 and 14 outside of the sheet midden or the probable structure area (see Figure 7b), as well as in Unit 15 in the northern part of the sheet midden.

Transfer-printed sherds are by far the most abundant of the decorated pearlware and whiteware in the Josiah W. Fort component. They have a broad distribution at the site, but are concentrated in sheet midden and near-sheet midden deposits, including Unit 5 (n=60), Unit 3 (n=23), Unit 6 (n=14), Unit 4 (n=13), and Unit 19 (n=13). More than 58 percent of the decorated pearlware are transfer-printed

Table 2. Refined earthenwares and porcelain sherds from the Josiah W. Fort component.

Ware	Rim	Body	Base	Handle	N
Pearlware					
Plain	-	20	2	-	22
Hand-painted	1	2	-	-	3
Transfer-printed	1	6	-	-	7
Shell-edged	2	-	-	-	2
Maker's mark	-	1	-	-	1
Sub-total	4	29	2	-	35
Whiteware					
Plain	13	77	5	1	96
Hand-painted	13	30	-	-	43
Annular ware	8	9	-	-	17
Transfer-printed	53	159	2	6	220
Shell-edged	20	-	-	-	20
Flow blue	-	3	-	-	3
Maker's marks	-	2	-	-	2
Sub-total	107	280	7	7	401
Porcelain					
Plain	-	3	-	-	3
Totals	111	312	9	7	439

sherds; 73 percent of the whiteware decorated sherds have transfer-printed designs (see Table 2).

There are six colors of transfer-printed sherds in the assemblage (Table 3). Brown is the principal color among the sherds, accounting for 33 percent of the sample, followed by red (16 percent), black (16 percent), blue (15 percent), green (10 percent), and purple or mulberry (10 percent). Black transfer-printed rims (26 percent of the rims) are proportionally more abundant than the black transfer-printed rims and body sherds as a group, while purple transfer-printed rims (3.7 percent of the rims) are proportionally less abundant than the purple transfer-printed rim and body sherds as a group.

Samford (1997:Table 5) provides date ranges for color on transfer-printed wares. The mean beginning and end production dates for these colors range from 1817 to 1852, with a medium blue the earliest (1817-1834) and mulberry the latest (1837-1852). Taken together, the mean beginning and end production dates for the different transfer-printed colors is 1827-1841, closely corresponding to the occupation range for the Josiah W. Fort component at the Clear Creek site.

Black transfer-printed rim sherds are from straight (Figure 8a-b, d-f, h-i) and scalloped (Figure 8c, g, j-l) plates. Identified patterns on these rims include Italian Villas and Scott's Illustration (Table 4). These patterns have age ranges that begin between 1828-1832 and end between 1841-1860.

Body sherds of the black transfer-printed sherds have identified motifs on central designs (see Samford 1997:Table 3) that include Romantic (n=1), Floral (n=1), Classical (n=2), and Chinese (n=1) (Figure 9b-d). Periods of peak production for these central designs on transfer-printed wares range from 1820-1845 (Samford 1997:Figure 17).

Red transfer-printed rim and body sherds include both Scott's Illustration and Ruins patterns, with age ranges of 1832-1860 and 1800-1864, respectively (Figure 10f-j; see also Table 4). Motifs on central designs include Romantic (n=2), Floral (n=1), Pastoral (n=1), and Classical (n=1), with peak production periods that range from 1815-1845.

As mentioned above, brown transfer-printed sherds are the most abundant in the Josiah W. Fort component, accounting for 33 percent of the transfer-printed sherds in the assemblage (see Table 3). Patterns identified in these sherds include the Virginia (1815-1834, Figure 11c, f, m-n) on whiteware plates, including a plate with a scalloped

Table 3. Transfer-printed sherds from the Josiah W. Fort component, both whiteware and pearlware.

Transfer-printed color	Rim	Body/Base	Handle	N
Black	14	22	-	36
Red	8	29	-	37
Brown	16	60	-	76
Blue	9	24	1	34
Purple or mulberry	2	17	3	22
Green	5	15	2	22
Totals	54	167	6	227

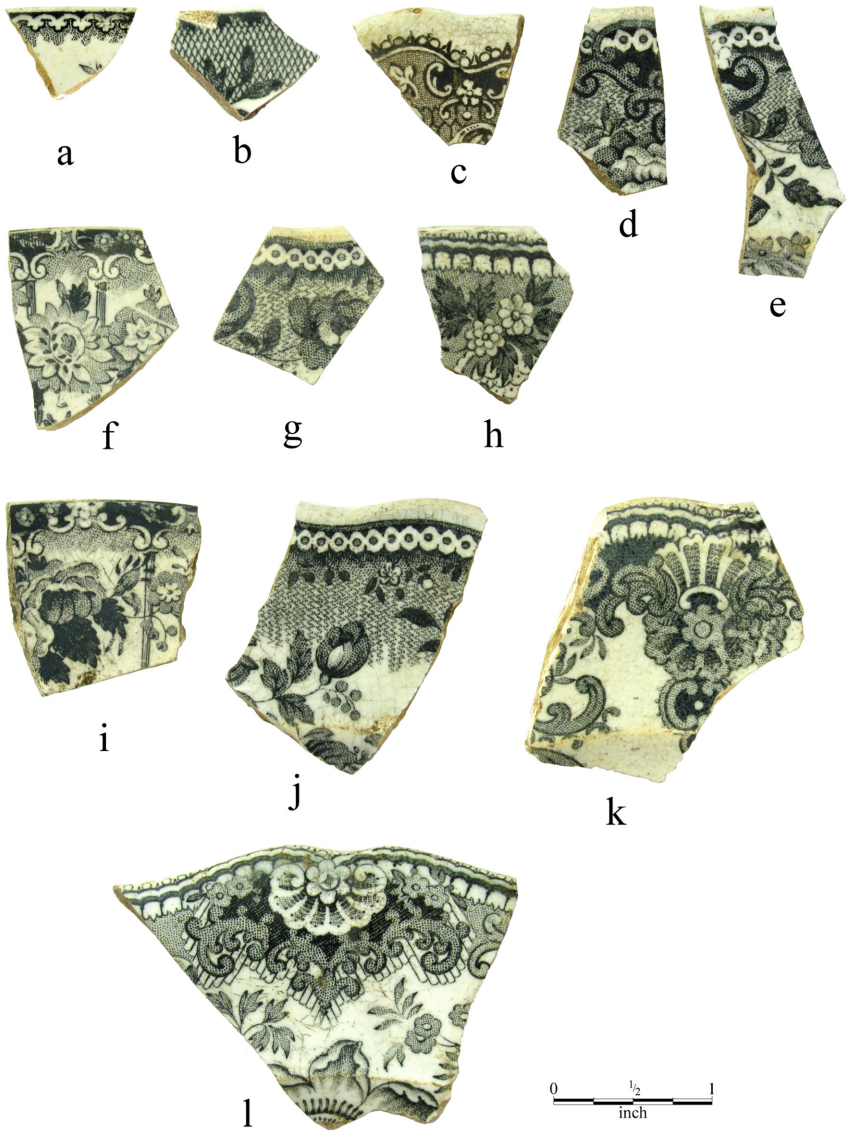

Figure 8. Black transfer-printed rim sherds from the Clear Creek site. Provenience: a, Unit 4, 10-20 cm bs; b, Unit 5, 20-30 cm bs; c, Unit 3, 10-20 cm bs; d, Unit 5, 0-10 cm bs; e, Unit 3, 10-20 cm bs; f, Scrape 1; g, surface, midden; h, Unit 5, 0-10 cm bs; i, Unit 19, 10-20 cm bs; j, ST 6, 0-20 cm bs; k, Unit 15, 10-20 cm bs; l, SS 64, 30-40 cm bs.

Table 4. Identified transfer-printed patterns.

Color	Pattern	Age range	Figure No.	References
Black	Italian Villas	1828-1841	8d-e, g, j; 9a-b, d-e	Coysh and Henrywood 1982: 173, 196; Pollan et al. 1996: 50; Williams 1978:306
Black	Scott's Illustration	1832-1860	8h, k-l; 9c	Coysh and Henrywood 1982: 324-325; Pollan et al. 1996: 68; Williams 1978:519-520
Red	Scott's Illustration	1832-1860	10f-g	Coysh and Henrywood 1982: 324-325; Pollan et al. 1996: 68; Williams 1978:519-520
Red	Ruins	1800-1864	10h-j	Williams 1978:398
Brown	Virginia	1815-1834	11c, f, m-n	Coysh and Henrywood 1982: 87; Earls et al. 1996:170; Hughes and Hughes 1968:151; Pollan et al. 1996: 84; Williams 1978:641
Brown	Chinese Bower	1820-1880	11g*	Pollan et al. 1996:27
Brown	Italian Villas	1828-1841	11l	Coysh and Henrywood 1982: 173, 196; Pollan et al. 1996: 50; Williams 1978:306
Brown	BAS #49	1810-1880	11a, d, k	Pollan et al. 1996:99; Coysh 1972:7
Blue	Scott's Illustration	1832-1860	13a	Coysh and Henrywood 1982: 324-325; Earls et al. 1996: 168; Pollan et al. 1996:68; Williams 1978:519-520
Blue	Beehive	1828-1864	13c-e	Pollan et al. 1996:121; Williams 1978:609; Williams and Weber 1986:658
Blue	Tuscan Rose	1814-1837	13g	Coysh and Henrywood 1982: 302, 372; Pollan et al. 1996: 78; Williams 1978:51-52; Williams and Weber 1986:53 Blake and Freeman 1998:107
Green	Sea Leaf	1834-1866	15a, d	Coysh and Henrywood 1982: 102; Earls et al. 1996:214, 318-325; Pollan et al. 1996:69; Williams 1978:667; Blake and Freeman1998:98

*pearlware

lip and impressed or beaded dots along the border; the Chinese Bower (1820-1880, Figure 11g) on a pearlware plate; Italian Villas (1828-1841, Figure 11l); and an unidentified pattern designated BAS #49 (1810-1880, Figure 11a, d, k) by Pollan et al. (1996:99). Motifs on central designs for the brown transfer-printed sherds include Floral (n=1), Classical (n=1, and Exotic (n=1, Figure 11g). These motifs have peak production periods that range from 1810-1845.

There is a distinctive brown transfer-printed plate or plates that is widely distributed in the whiteware sherd assemblage (Figure 12a-c, see also Figure 11o), including six rim sherds and 14

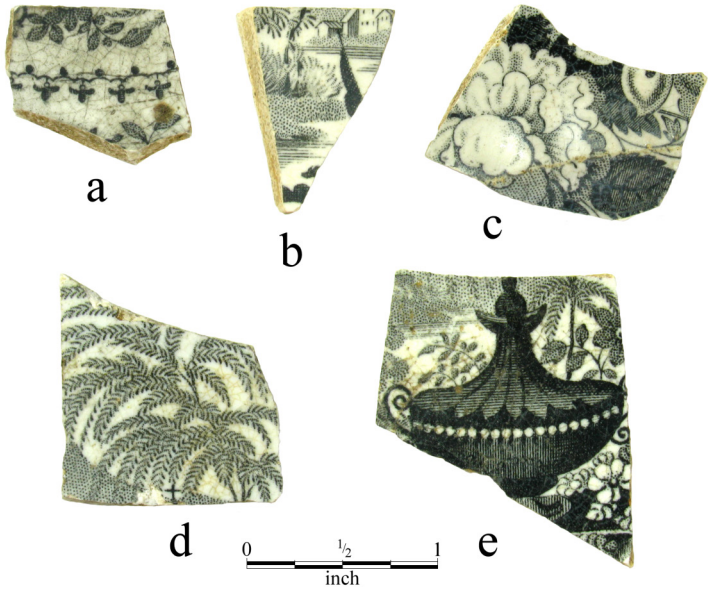

Figure 9. Black transfer-printed body sherds. Provenience: a, ST 23, 20-40 cm bs; b, Scrape 1; c, surface, midden; d, Unit 19, 20-30 cm bs; e, ST 23, 0-20 cm bs.

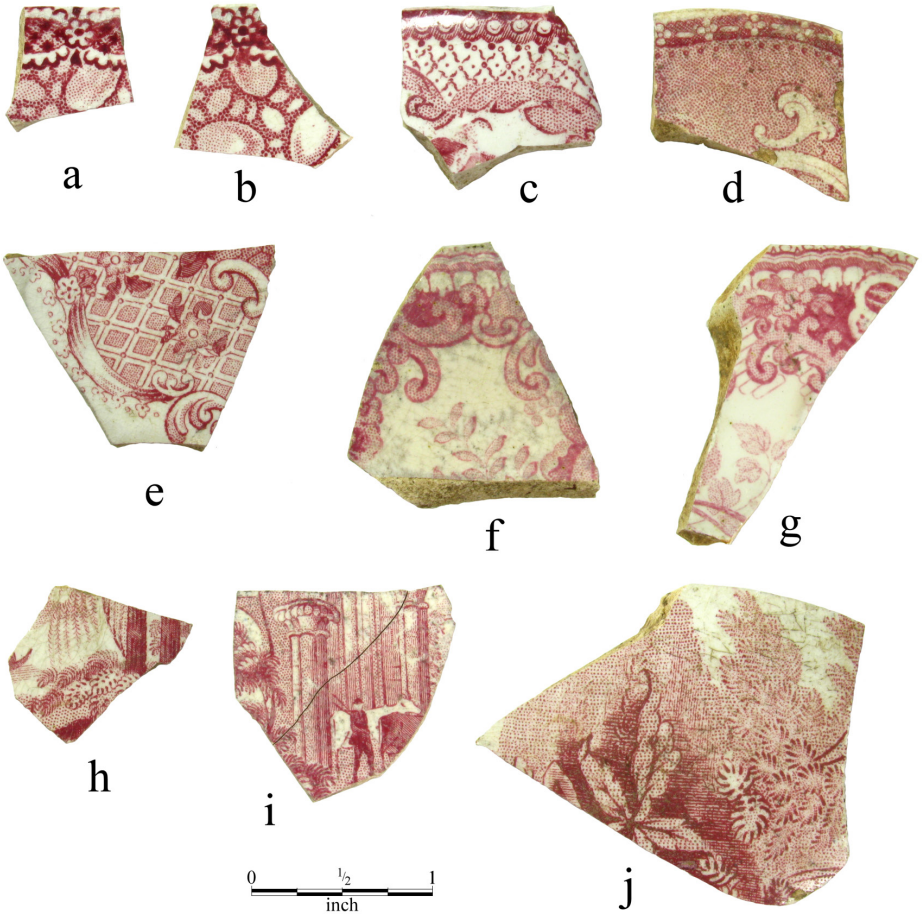

Figure 10. Red transfer-printed rim and body sherds. Provenience: a, Unit 19, 10-20 cm bs; b, ST 25, 20-40 cm bs; c, Unit 5, 20-30 cm bs; d, surface, midden; e, ST 23, 0-20 cm bs; f, surface, midden; g, Unit 15, 10-20 cm bs; h, surface, midden; i, ST 7, 0-20 cm bs; j, Unit 5, 10-20 cm bs.

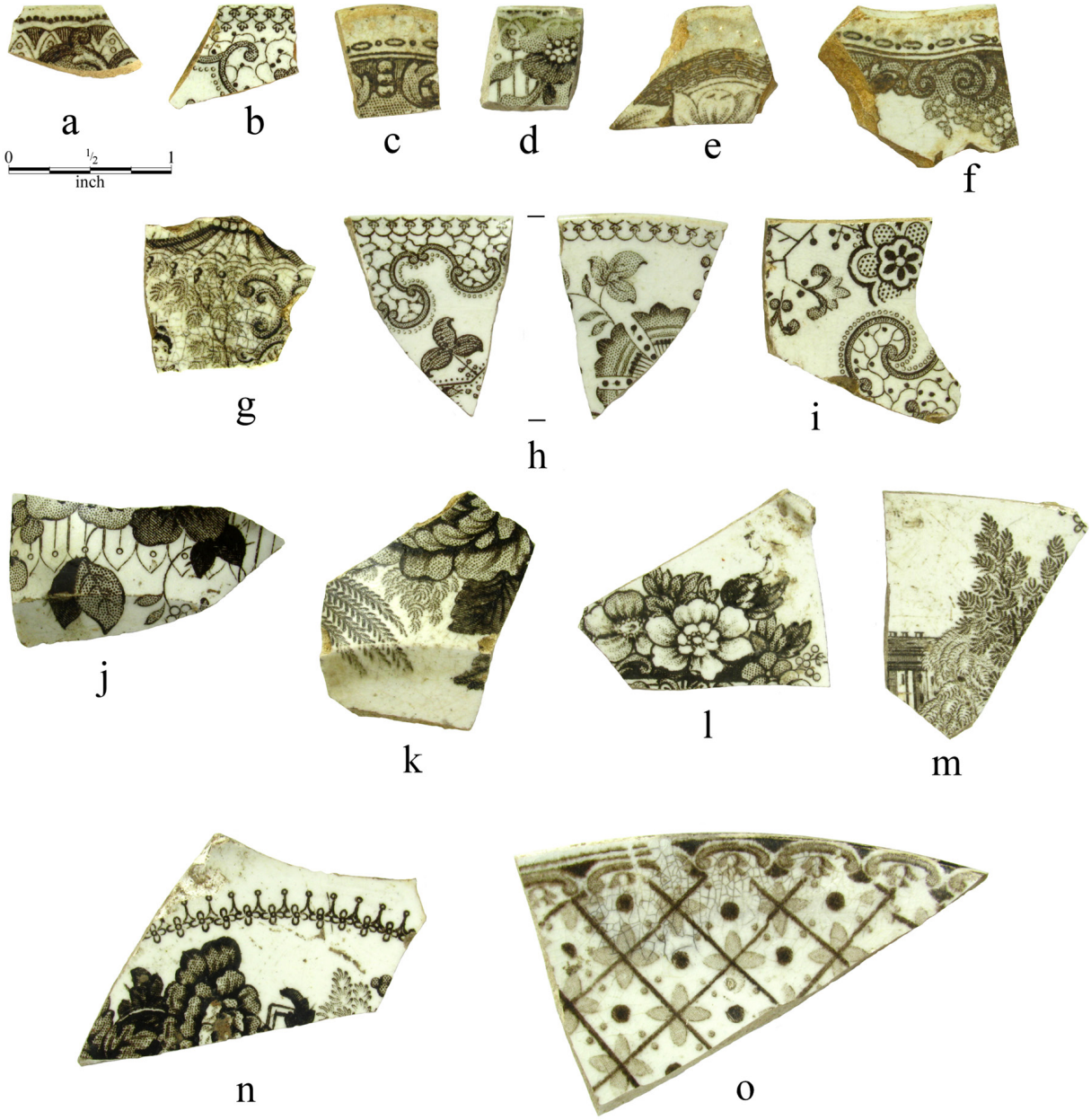

Figure 11. Brown transfer-printed rim and body sherds. Provenience: a, Unit 16, 0-10 cm bs; b, ST 22, 0-20 cm bs; c, Unit 1, 0-10 cm bs; d, Unit 6, 20-30 cm bs; e, surface, midden; f, ST 5, 0-20 cm bs; g, Unit 5, 30-40 cm bs; h, Unit 6, 10-20 cm bs; i, Unit 3, 20-30 cm bs; j, Unit 3, 40-50 cm bs; k, ST 6, 0-20 cm bs; l, Unit 11, 30-40 cm bs; m, SS 64, 20-30 cm bs; n, SS 64, 30-40 cm bs; o, Unit 5, 50-60 cm bs.

body sherds from the sheet midden and near-sheet midden deposits One of the body sherds has a Davenport maker's mark on the exterior surface (see Figure 17a, below), and a rim and body sherd from Units 6 and 19, 4 m apart, can be conjoined (Figure 12c). A number of brown transfer-printed sherds are from the fill of Feature 1.

This particular brown transfer-printed design has a border of small scrolls or scalloped semi-circles, flowers, and solid triangles above a series of rows of four-petal flowers and small open circles that are overlain by a diamond-shaped grid of brown lines. Within each grid is a central brown dot. One rim sherd has only the diamond-shaped grid and central brown dots (see Figure 12b).

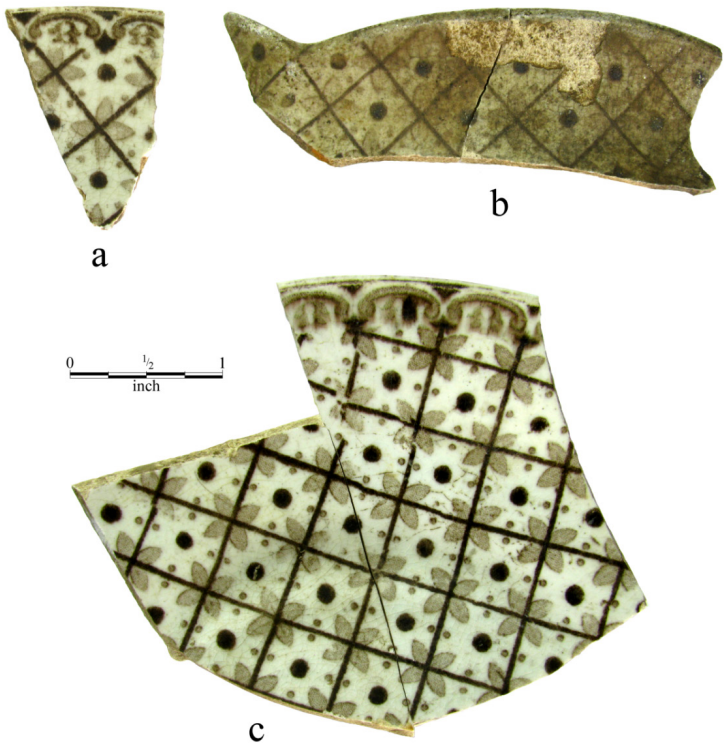

Figure 12. Distinctive brown transfer-printed pattern. Provenience: a, Unit 5, 10-20 cm bs; b, Unit 20, 0-10 cm bs; c, conjoined sherds, Unit 6, 30-40 cm bs and Unit 19, 10-20 cm bs.

Patterns identified in the blue transfer-printed whiteware sherds include Scott's Illustration (1832-1860, Figure 13a) Beehive (1828-1864, Figure 13c-e), and the Tuscan Rose (1814-1837, Figure 13g). The latter pattern is on a plate with a scalloped lip and impressed dots along the border. Motifs on central designs include Floral (n=3, Figure 13f), Classical (n=1), and Chinese (n=1). These designs have peak production periods that range from 1810-1845.

Several of the purple transfer-printed sherds have transfer-printed designs on both interior and exterior surfaces (Figure 14a, c), although no specific patterns could be identified. Motifs on central designs include Romantic (n=1), Floral (n=1, Figure 14d), and Chinese (n=1, Figure 14c), with peak production periods that range from 1810-1850.

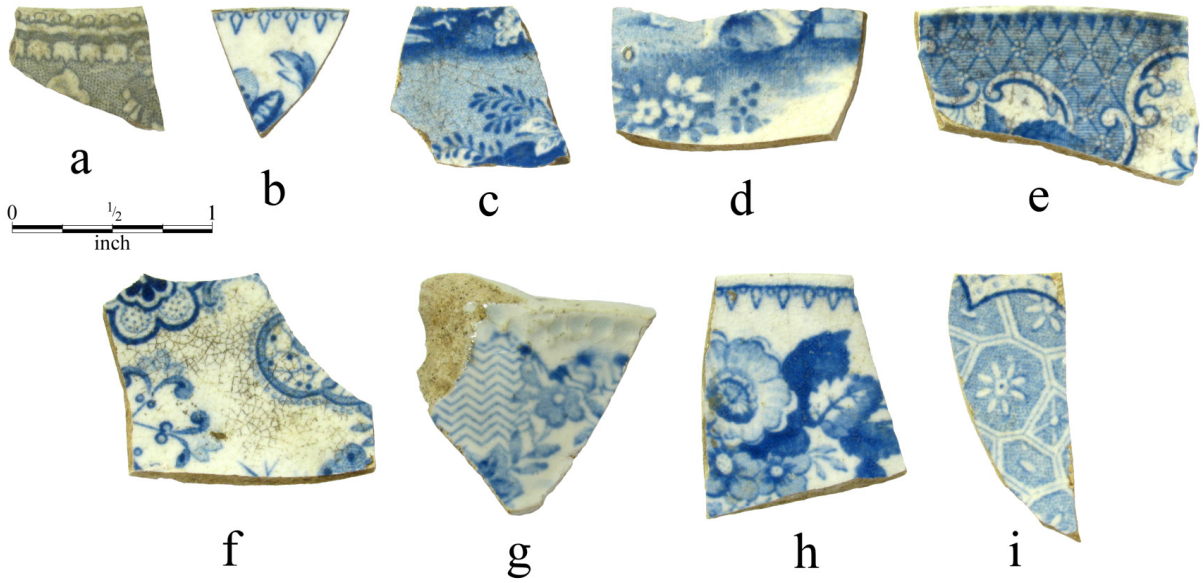

Figure 13. Blue transfer-printed rim and body sherds. Provenience: a, SS 64, 10-20 cm bs; b, SS 64, 0-10 cm bs; c, Unit 3, 10-20 cm bs; d, surface, midden; e, Unit 3, 10-20 cm bs; f, Unit 3, 10-20 cm bs; g, ST 24, 20-40 cm bs; h, Unit 5, 20-30 cm bs; i, surface, midden.

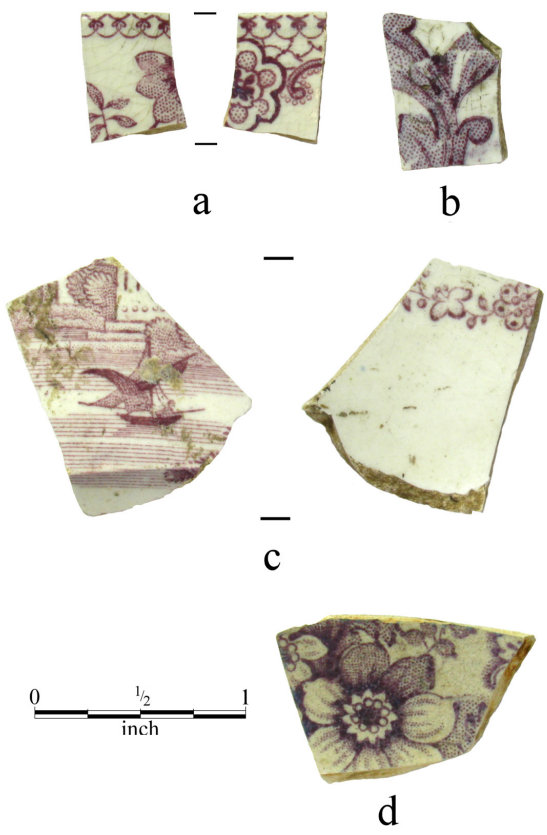

Figure 14. Purple transfer-printed rim and body sherds. Provenience: a, Unit 8, 20-30 cm bs; b, Unit 5, 20-30 cm bs; c, Unit 5, 20-30 cm bs; d, Unit 11, 30-40 cm bs.

The few green transfer-printed rim and body sherds from the Josiah W. Fort component include several with the Sea Leaf pattern (1834-1866) (Figure 15a, d). Others have floral motifs and scroll elements along the border (Figure 15b-c).

Six whiteware cup sherds from the Josiah W. Fort component have transfer-printed handles. Three are from midden deposits, and the other three are from near-midden contexts. Three of the handles have purple transfer-printed patterns (Figure 16a-b), two handles have a green transfer-printed Sea Leaf pattern (Figure 16c; see also Table 4), and the last handle has a blue floral transfer-printed pattern.

The purple transfer-printed handles have different decorative patterns. Two are floral, with branches, flowers, and leaves (see Figure 16b), while the other has a regular series of diamonds, dots, and crosses (see Figure 16a).

Several whiteware and pearlware sherds in the refined earthenware assemblage have printed or impressed maker's marks. The one pearlware sherd with a maker's mark has a DAVENPORT stamp, an anchor, and 3 and 6 on either side of the anchor (Figure 17f). This mark indicates the plate was made by the W. Davenport & Co. in 1836. Another vessel with a "…PORT" mark and a brown printed scroll is also a Davenport vessel (Figure 17a). The other side of the whiteware plate has a distinctive Virginia transfer-printed pattern (1815-1834, see Figure 11o).

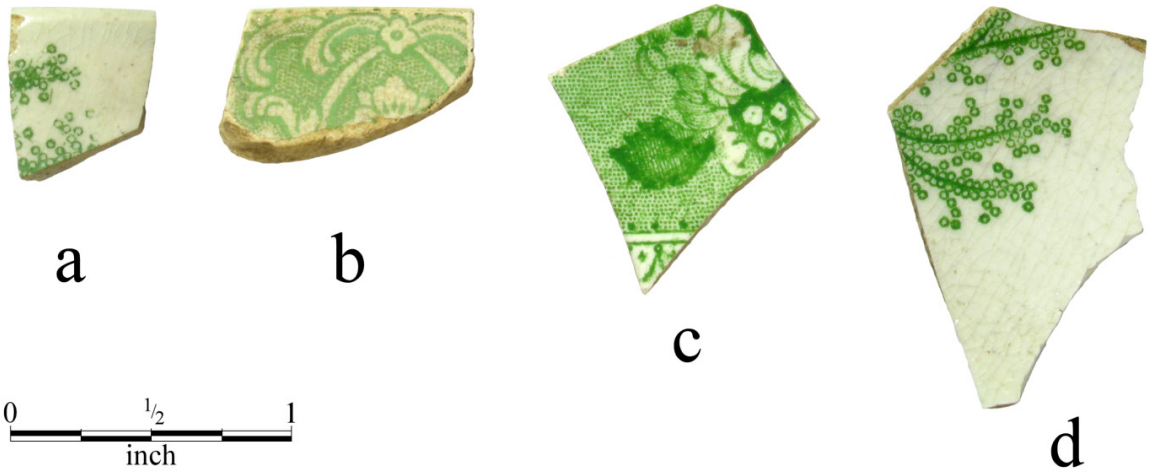

Figure 15. Green transfer-printed sherds. Provenience: a, Unit 4, 10-20 cm bs; b, Unit 13, 0-10 cm bs; c, Unit 5, 20-30 cm bs; d, Unit 5, 10-20 cm bs.

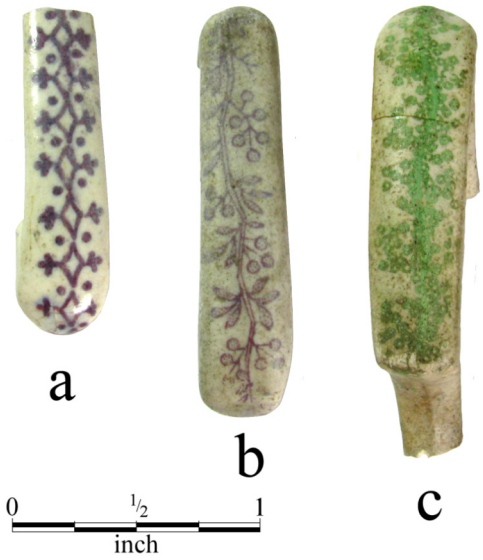

Figure 16. Transfer-printed cup handles. Provenience: a, ST 5, 0-20 cm bs; b, ST 25, 40-60 cm bs; c, Unit 4, 20-30 cm bs.

Two whiteware sherds from the surface have the following printed maker's marks: "…SHIR…" and "OPA…" The first is on a hand-painted sherd made in an English pottery, and the second mark has a lavender Classical View transfer-printed decoration (see Samford 1997:Table 3). Such transfer-printed views were popular between ca. 1810-1840. The "OPA…" or "OPAQUE" mark is found on English pottery from the late 1830s to the late 19th century (see Gibson 2011). A whiteware sherd with a scroll and a blue printed "OPAQUE" mark was found in Unit 20 (see Figure 17b). Another whiteware sherd has a portion of a black printed mark: "SEMI…" (see Figure 17e), probably referring to the vessel as a semi-porcelain.

The remaining two sherds with maker's marks have either brown or purple printed marks and associated scrolls. The purple transfer-printed mark ("HENDERSON…") is from either Henderson & Gaines (1836-1866) or Henderson Walton & Co. (1834-1836) (see Pollan et al. 1996:28; see also Figure 17c). The other side of the plate has a purple

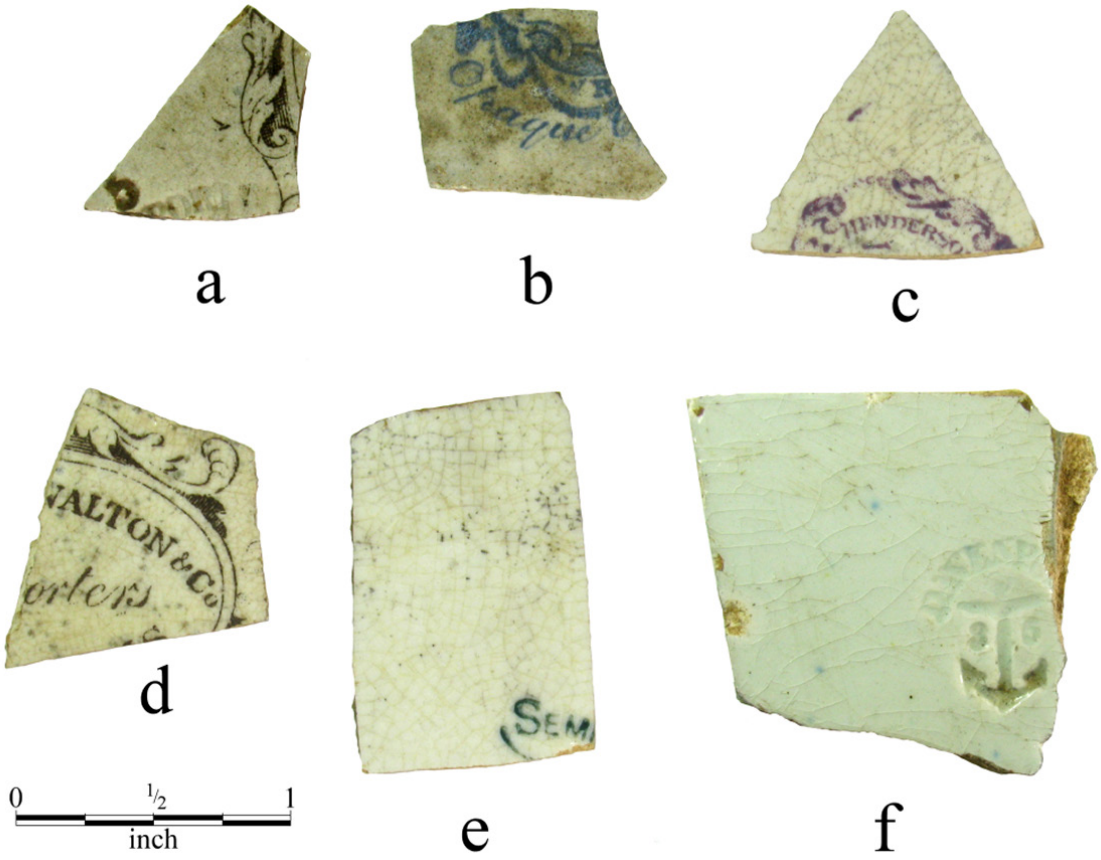

Figure 17. Refined earthenware maker's marks. Provenience: a, Unit 5, 10-20 cm bs; b, Unit 20, 0-10 cm bs; c, Surface, midden area; d, Unit 15, 0-10 cm bs; e, ST 46, 0-20 cm bs; f, Unit 3, 10-20 cm bs.

transfer-printed Ruins pattern (1800-1864). The brown transfer-printed mark has "…WALTON & Co" and "…orters" lettering, indicating it is from the Henderson Walton & Co. (1834-1836) (see Figure 17d).

The 22 shell-edged rim sherds in the Josiah W. Fort component include two blue shell-edged pearlware rims, 13 blue whiteware rims (Figure 18b, d-j), and seven green shell-edged rims (Figure 18a, c). All of the shell-edged rims have even, symmetrical scallops with straight impressed lines, and these shell-edged vessels were produced between ca. 1800 and 1840 (Hunter and Miller 2009:13). After the 1840s, scalloped shell-edged vessels were no longer being made by manufacturers, and the green edging "became rare after 1840" (Hunter and Miller 2009:13).

Four of the shell-edged rims have an embossed edge with floral motifs (see Figure 18c-d), one blue pearlware rim, two green whiteware rims, and one blue shell-edged whiteware rim. According to Hunter and Miller (2009:13), the embossed edge rim treatment was developed around 1825, and "remained popular well into the 1830s."

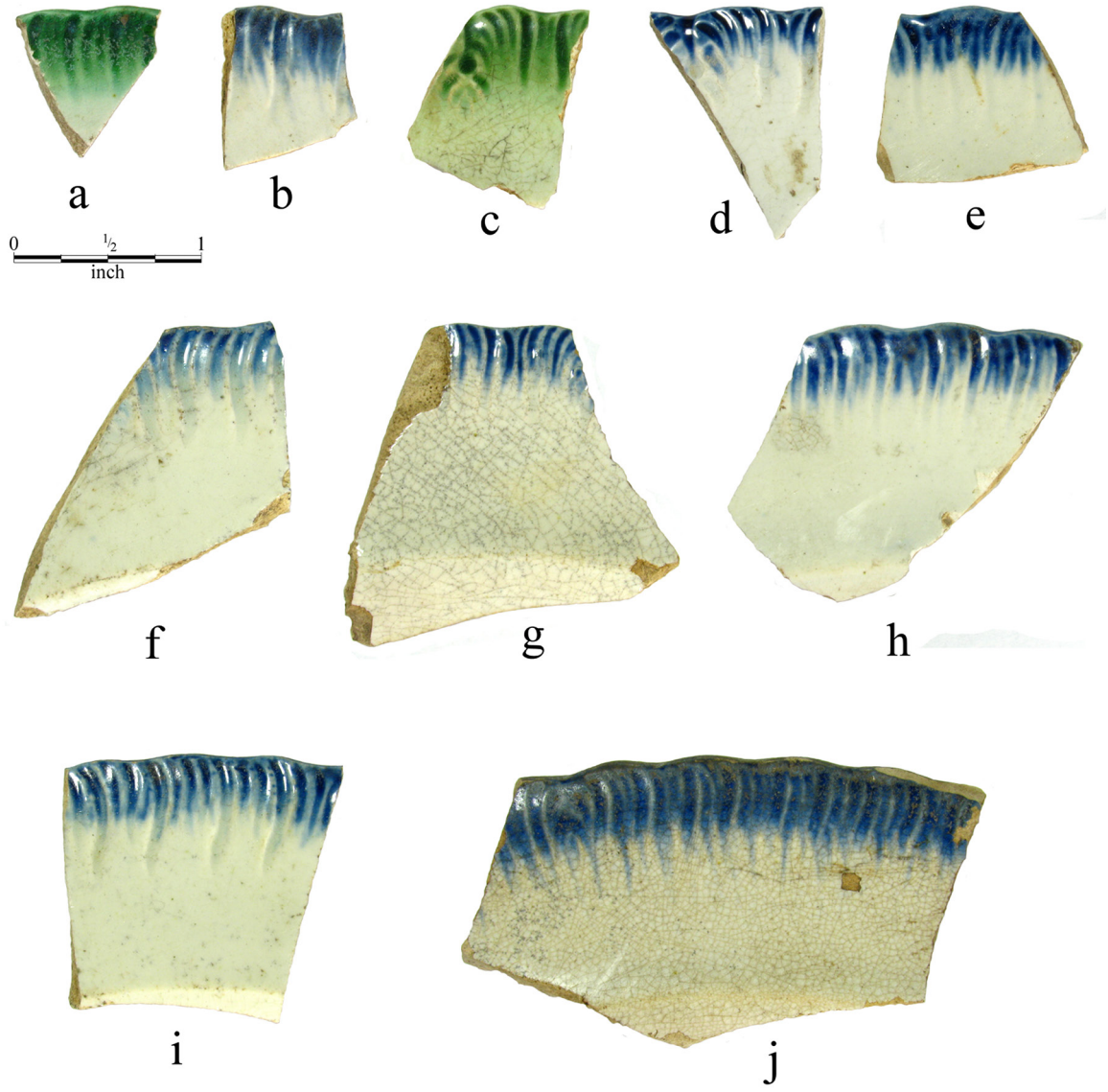

Figure 18. Scalloped green and blue shell-edged refined earthenware rim sherds. Provenience: a, Unit 5, 50-60 cm bs; b, Unit 4, 10-20 cm bs; c, Unit 1, 20-30 cm bs; d, Unit 5, 30-40 cm bs; e, surface; f, Unit 8, 10-20 cm bs; g, surface, 1.8 m northeast of Unit 11; h, Unit 5, 10-20 cm bs; i, Unit 7, 10-20 cm bs; j, surface 1 m south of ST 19.

Hand-painted fine-line and bold polychrome pearlware and whiteware sherds represent about 15 percent of the decorated refined earthenware sherds in the Josiah W. Fort component (see Table 2). Three are pearlware and the other 43 hand-painted sherds are on whiteware. Only five of the sherds, all whitewares, have fine-line or sprig hand-painted designs of branches, leaves, flowers, and dots (Figure 19f-g). Another sherd has the black outlines of flowers and petals, with hastily executed and only partially filled in overglaze blue and red painted areas (Figure 19d).

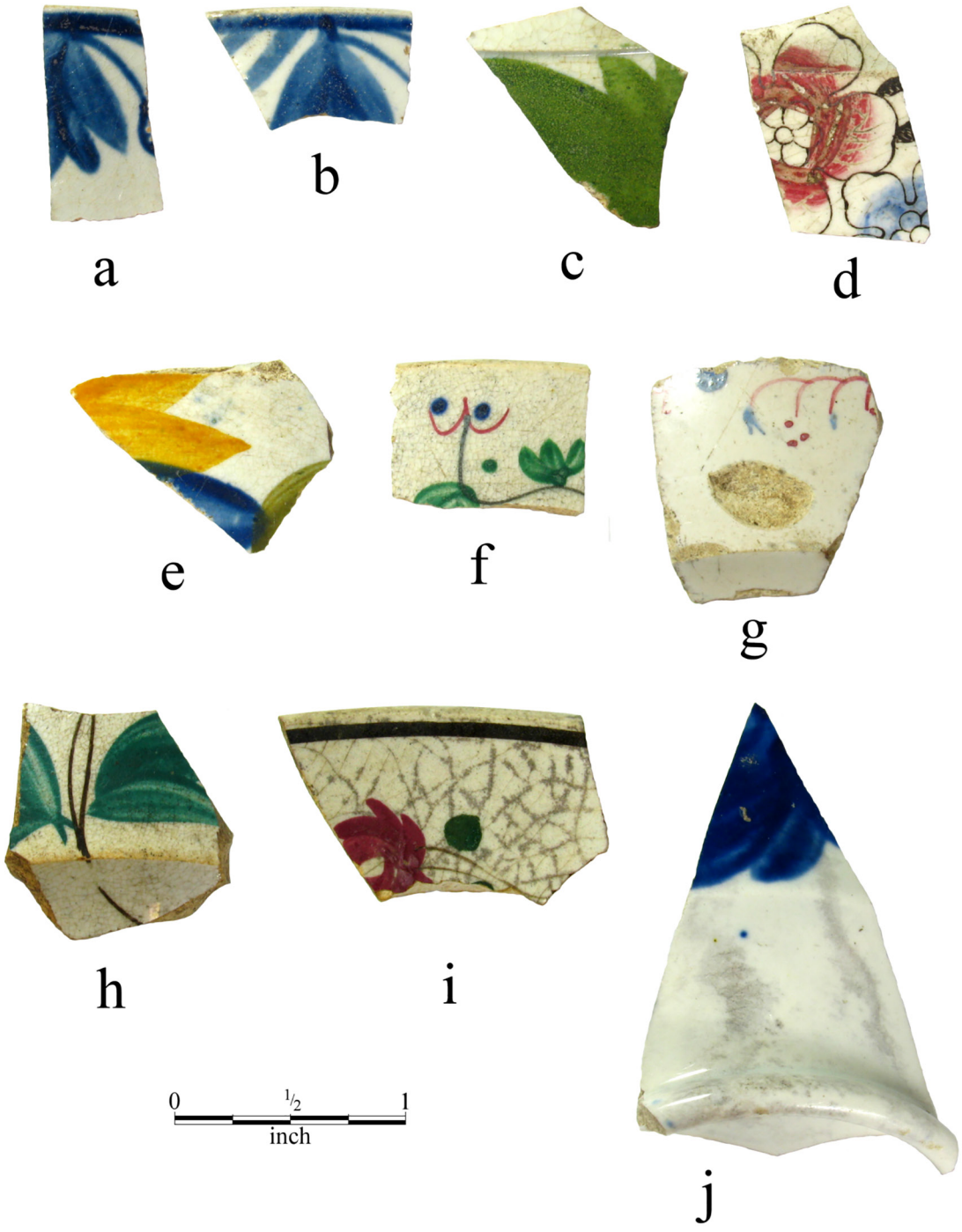

Figure 19. Hand-painted refined earthenware sherds: a, surface, midden; b, Unit 3, 20-30 cm bs; c, Unit 9, 0-10 cm bs; d, Unit 5, 0-10 cm bs; e, Scrape 4; f, Unit 8, 10-20 cm bs; g, Unit 7, 10-20 cm bs; h, surface, 1 m north of ST 8; i, surface, northwest area; j, Unit 5, 30-40 cm bs.

The remainder of the hand-painted sherds (n=40) have bold polychrome floral designs—dark blue, green, yellow, and red—and dots, as well as black branches and stems (see Figure 19a-c, e, h-j). Three of these sherds are on pearlware, and the remainder are on whiteware. Cup rims also have blue, red, and black hand-painted near lip lines.

Slipped or annular wares, all whitewares, in the assemblage represent approximately 5 percent of the decorated sherds in the Josiah W. Fort component. One of the sherds has gray and white-slipped bands as well as a portion of a cable or common cable, also known as a "twig" (Figure 20h) (Carpentier and Rickard 2001:128 and Figure 30).

The annular wares have a variety of slipped band color combinations. These include green (n=1, see Figure 20a); black and white bands (n=2, see Figure 20b, k); brown, yellow, and blue (n=4, see Figure 20c, e), with a rouletted blue band; gray, white, and black bands (n=2, see Figure 20f-g); brown, white, and blue (n=2, see Figure 20d); blue and brown (n=1); blue, yellow, black, and white (n=2, see Figure 20i-j); brown (n=1); and dark blue (n=1) slipped bands.

Three whiteware body sherds from Unit 6, and from the surface near ST 16 at the far northeastern end of the Josiah W. Fort component have a dark blue flow blue decoration (Figure 21a). Flow blue decorations on plates and other forms were introduced in the early 1830s, and were first popular in the 1840s and 1850s in the U.S. market (Blake and Freeman 1998:121; Samford 1997:24). The presence of this decorative ware in the 1836-1840 component indicates that the Fort family obviously had access to early flow blue vessels when they first settled in Bowie County, Texas.

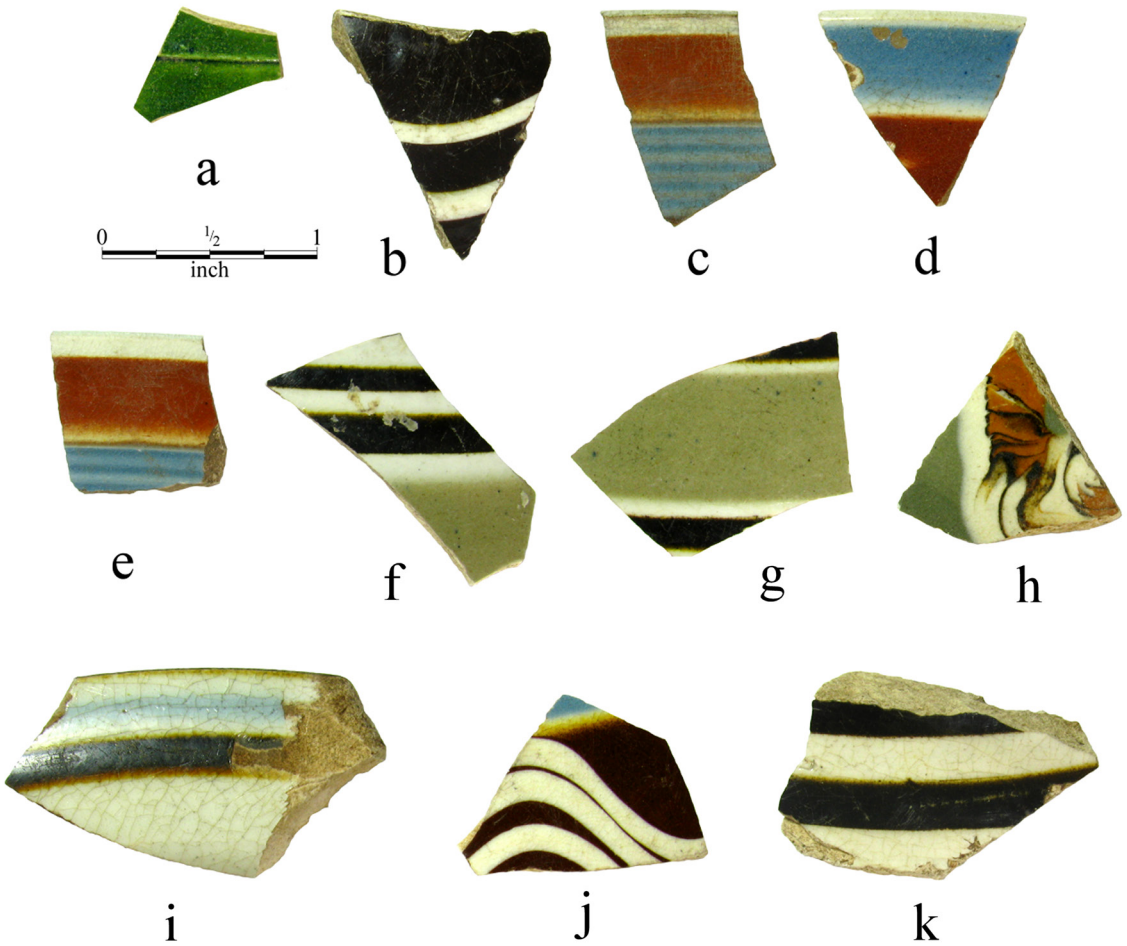

Figure 20. Annular ware rim and body sherds: a, SS 64, 40-50 cm bs; b, Unit 5, 10-20 cm bs; c, ST 53, 0-20 cm bs; d, Scrape 3; e, Unit 5, 20-30 cm bs; f, Unit 5, 20-30 cm bs; g, midden surface; h, Unit 15, 10-20 cm bs; i, midden surface; j, midden surface; k, surface 8 m west of Unit 2.

Three transfer-printed whiteware sherds have clobbering (see Figure 21b). Clobbering is "the use of polychrome enamels (such as blue, red, green, and yellow) overglaze to accent a transfer-printed pattern, usually only in small areas" (Blake and Freeman 1998:121). In the case of the clobbered sherds from the Josiah W. Fort component, there are red, yellow, and blue overglazed areas on purple, brown, and green transfer-printed body sherds, respectively.

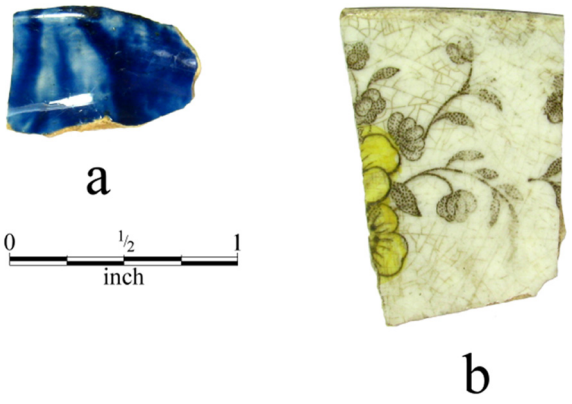

Figure 21. Flow blue and clobbered brown transfer-printed sherds. Provenience: a, Unit 16, 10-20 cm bs; b, Unit 5, 10-20 cm bs.

As previously noted, transfer-printed ceramics, one of the more expensive ceramic wares produced at the time other than porcelain, account for almost 73 percent of the decorated sherds in the Fort component at the Clear Creek site. In Miller's (1991) CC index values, transfer-printed pottery has an index value at ca. 1840 of 3.82, with 1.00 being the cheapest wares; the higher the index, the more expensive the ceramic ware. Porcelain's CC index value is 7.0, indicating it is the most expensive ware at that time. Flow blue-printed ceramics have an estimated CC value of 3.25, while the other main decorated ceramics have CC index values of less than 1.7: dipped or annular ware (1.22); sponge/spatter ware (1.22), hand-painted (1.6), and shell-edged (1.64).

By way of comparison, the examination of the decorated ceramic sherd assemblages at other generally contemporaneous and pre-1860 sites in Texas and Louisiana (Table 5) indicates that only at Old Velasco, an active shipping port on the Texas coast, were transfer-printed wares almost as common (70 percent) as they were in the Josiah W. Fort component. At the other sites listed in Table 5, transfer-printed sherds account for only between 10.3-37.9 percent of the decorated sherd assemblages.

Table 5. Selected early to mid-19th century decorated sherd assemblages in Texas and Louisiana.

Site/ Trinomial	Age	AW	S/S	HP	TP	FB	SE	N	Reference
Clear Creek 41BW698	1836-1840	5.6*	-	14.2	72.6	1.0	6.6	303	This article
Big Cash Bayou 16CT451	1840	23.2	4.9	34.1	31.7	-	6.1	82	Hunter 2004
Milligan Pt. 41CP276	1837-1846	4.7	10.1	30.4	5.4	2.0	47.3	148	Nelson and Perttula 2003
Roseborough Lake, 41BW5	1830s-1840s	13.3	-	32.0	34.7	6.7	13.3	75	Gilmore 1986
Old Velasco 41BO125	1830s-1840s	5.2	-	15.6	70.0	-	9.1	231+	Earls et al. 1996
McClure 41RK365	1840s-1860s	29.4	7.5	10.3	28.0	-	24.8	214	Pemberton et al. 2011
James Franks 41DT97	1852-1857	17.4	7.7	30.0	28.6	-	16.4	195	Perttula 1989

*percentage; AW=annular ware; S/S=sponge/spatter; HP=hand-painted; TP=transfer-printed; FB=flow blue; SE=shell-edged

+based on estimated number of vessels

The contrast between the ceramic assemblage from the Josiah W. Fort occupation and other East Texas farm sites is striking. The most expensive wares at the Fort component (transfer-printed, flow blue, and porcelain) comprise more than 73.6 percent of the ceramic sherds in the assemblage, compared to only 28 percent from the McClure farmstead (Pemberton et al. 2011) and 28.6 percent at the James Franks site (Perttula 1989). The CC Index for the Josiah W. Fort component is 3.21, compared to 2.09 for the McClure farmstead and 2.15 for the James Franks farmstead. At the nearby plantation of Colin McKinney at the Roseborough Lake site, another prosperous plantation owner, the CC Index is 2.43, but well below the CC Index for the Josiah W. Fort ceramic assemblage. The CC Index for the Josiah W. Fort assemblage is comparable to merchants and planters in other parts of the United States who had access to higher priced ceramic sets (see Spencer-Wood and Heberling 1987:Figure 1).

The high relative frequency of decorated vessels in the Josiah W. Fort component, the dominance of plates and cups, and the overall great abundance of transfer-printed wares in the assemblage corroborate archival records (and later tax rolls) that the Josiah W. Fort occupation at the Clear Creek site represents the settlement of a very affluent plantation and slave owner, an owner that continued to be financially successful up to the time of his death in 1859. His total wealth in 1846 exceeded $23,000, significantly greater than the typical slave-owning farmer in antebellum Texas (see Lowe and Campbell 1987:80-82).

Stoneware and Redware Sherds

Stoneware jugs or crocks were used by the Josiah W. Fort family in the preserving of food stuffs. These were common utilitarian vessels made in local kilns (probably in the town of Jefferson) after the mid-1830s. The stoneware sherds (n=7) in the assemblage are from greenish-gray to gray salt-glazed vessels, glazed on the exterior (Figure 22), with either a dry interior, an interior brown glaze, or an interior brown lead glaze.

The differences in the color of the salt glaze, vessel body thickness, and the interior treatment (i.e., dry vs. glazed) in the salt-glazed sherds suggest that they are from at least three different vessels.

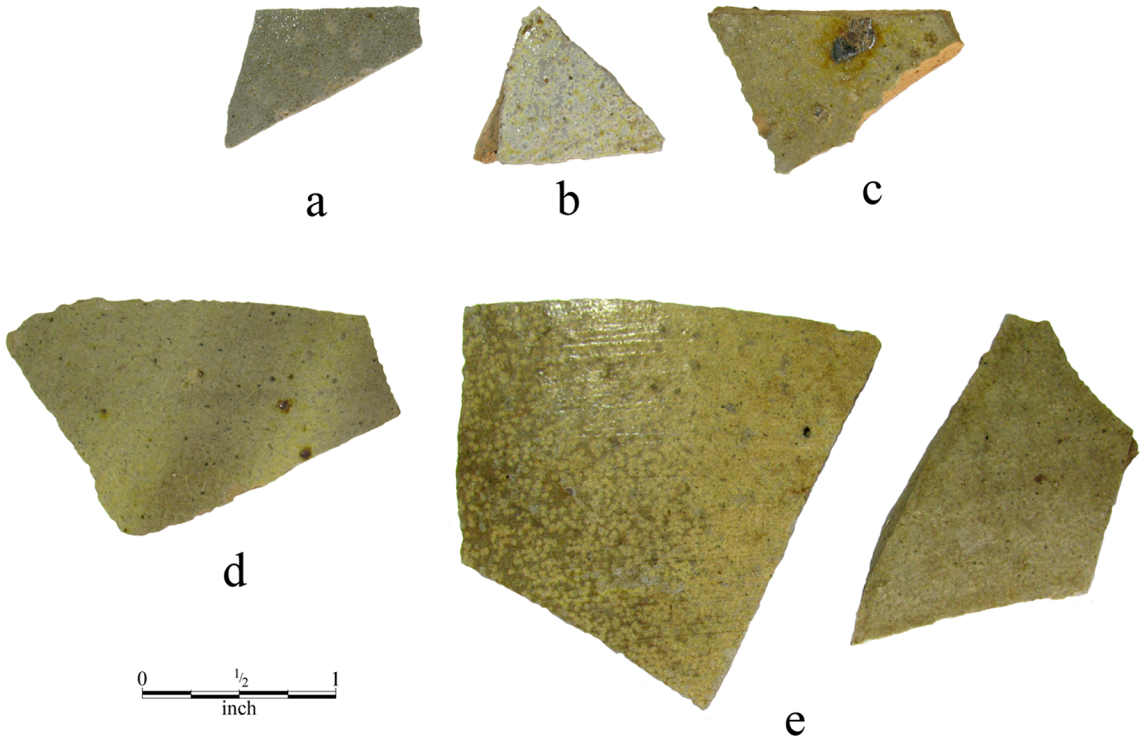

Figure 22. Salt-glazed stoneware body sherds. Provenience: a, Unit 7, 20-30 cm bs; b, Unit 5, 20-30 cm bs; c, ST 36, 0-5 cm bs; d, Unit 7, 30-40 cm bs; e, Surface, 8 m northwest of Unit 2.

One or more of the vessels had a dry interior, with body wall thicknesses ranging from 6.5-8.6 mm; one had an interior brown lead glaze; and another, with thin vessel walls (5.5-6.0 mm), had a dull interior brown glaze.

There are a few sherds (n=4) of a brown lead-glazed Redware at the Josiah W. Fort component. These sherds include a handle and three body sherds from an undecorated bowl (Figure 23a-c). The body sherds range from 3.7-6.0 mm in thickness.

According to Green et al. (1996:466), "glazed Redware is extremely rare in nineteenth century archaeological assemblages from northeastern Texas," and when found on historic sites, predates ca. 1850. Redware is a semi-refined earthenware with a high-fired semi-vitrified paste and an interior/exterior lead glaze (Hahn et al. 2010:126).

The last of the non-refined earthenwares from the 1836-1840 component is one sherd from SS 64 (30-40 cm bs). It has a black, lustrous lead glaze on both interior and exterior sherd surfaces.

Bottle Glass and Tableware Glass Shards

Bottle glass shards (n=124) are not common in the assemblage from the Josiah W. Fort site. This suggests that glass bottles were scarce and costly in 1830s rural and frontier settings in this part of Texas before there was a ready means to transport them, such as their transport by railroad or dependable steamboat traffic. The bottle glass found at the site came from bottles of different colors made by hand.

Most of the bottle glass is clear or colorless (53 percent), but there are occurrences of aqua (23 percent), olive green (15 percent), brown (8 percent), and black (2 percent) (Table 6). The black glass is actually a very dark olive green color, but the shards are almost completely opaque. The generally small size of the bottle glass shards prohibits their detailed consideration of vessel form or content, but it is the case that wine or beer bottles (Figure 24h), embossed paneled bottles and aqua-colored bottles that held food or medicines (Figure 24f-g), and very thin clear and aqua-colored vials (Figure 24e) (see Earls et al. 1996:Figure 109; Hunt 2008:Figure 69e) that held medicine can be identified in the bottle glass assemblage. The few embossed-paneled bottle shards have no letters or maker's names, only raised ovals and decorative molding (Figure 24g) on one or more panels.

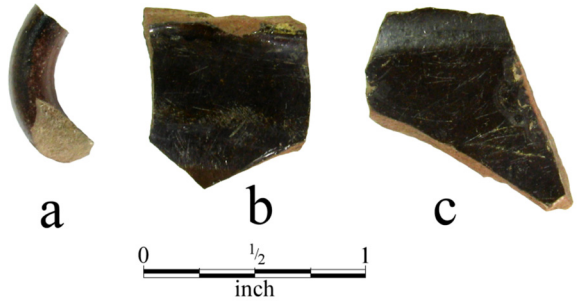

Figure 23. Lead-glazed Redware sherds. Provenience: a, Unit 5, 20-30 cm bs; b, Unit 18, 0-10 cm bs; c, Unit 19, 0-10 cm bs.

The black and olive green bottle shards are likely from wine bottles or other alcoholic beverages. Aqua-colored shards may be from bottles that held patent medicines, intoxicants, or food stuffs, as was likely the case with the clear bottle glass. The few brown bottle glass shards may be from case bottles or snuff containers.

The four glass tableware shards are lip shards from simple drinking vessels, or tumblers (Jones and Sullivan 1989:143). The lip shards are straight and fire-polished, and are from clear and aqua-colored vessels discarded in the sheet midden or in a unit (Unit 4) south of the midden deposits.

Pressed Glass Shards

Pressed or press-molded glass table wares, including tumblers, cup plates, and salts, were made as early as the 1820s (Jones and Sullivan 1989:34-35, 137-138), so it is not surprising that a few pressed glass shards, possibly from cup plates, are present in the Josiah W. Fort component. There are four pieces of clear pressed glass in the assemblage (see Figure 24a-d), found either in sheet midden deposits or in the hand-excavated unit just south of the sheet midden.

Three of the pressed glass shards (see Figure 24b-d) may be from the same cup plate. They have deeply scalloped edges, decorated on one side with a floral design, and on the other with rows of dots along the scalloped edge (see Figure 24d). One larger cup plate shard indicates that it is also decorated with triangular and small square elements filled with small-raised squares (see Figure 24c). The remaining pressed glass shard has a decorative motif consisting of raised scrolls surrounding a raised five-pointed star (see Figure 24a).

Table 6. Bottle glass and tableware glass artifacts from the Josiah W. Fort component at the Clear Creek site.

Shard color	Lip	Body	Base	N
olive green	-	18	-	18
aqua	2	26*	1	29
clear	4	58	7	69
brown	-	9	1	10
black	-	2	-	2
Totals	6	113	9	128

*includes embossed shards (n=4)

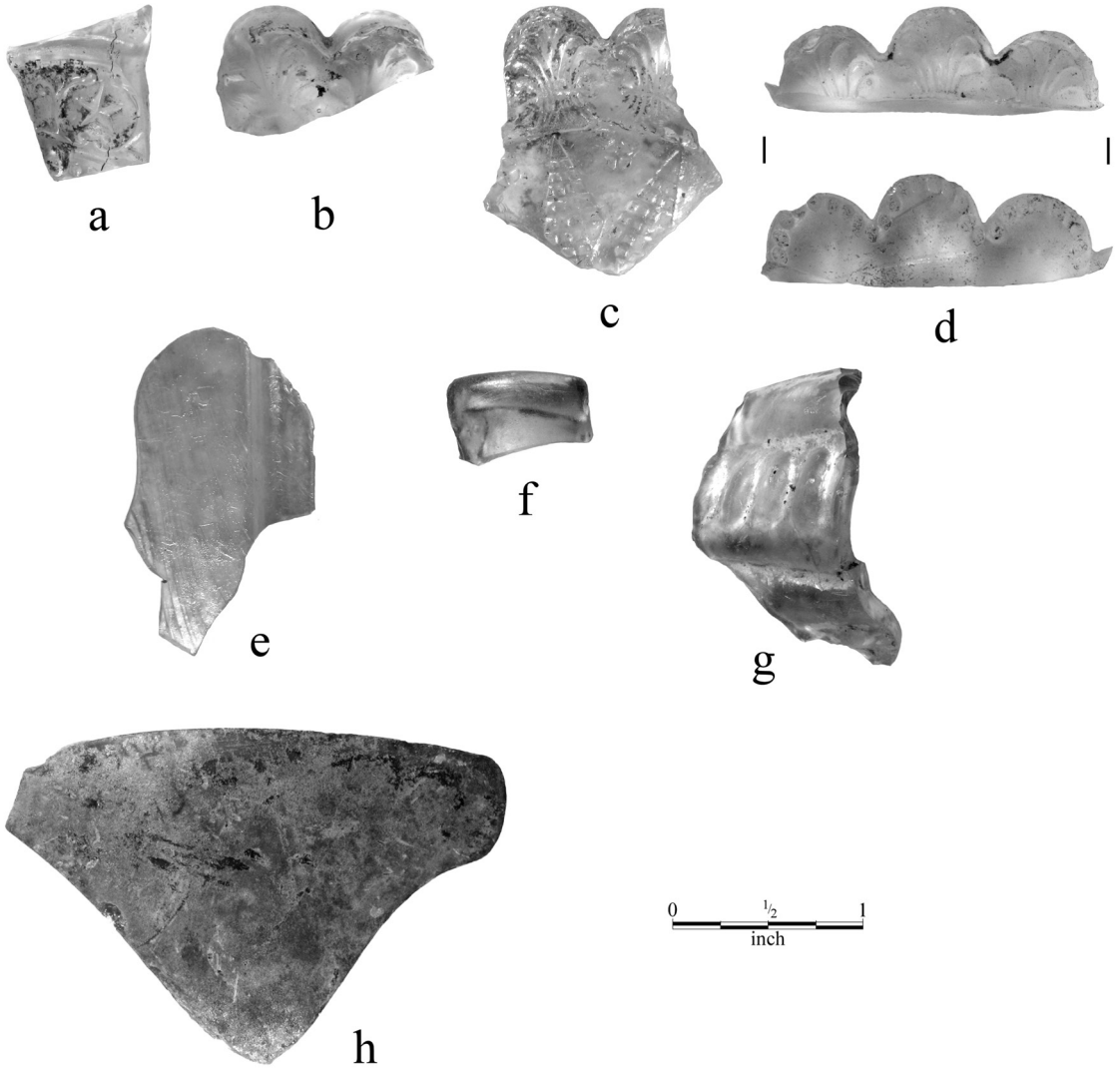

Figure 24. Glass artifacts from the Josiah W. Fort component: a-d, pressed glass; e, g, paneled bottle shards; f, aqua-colored bottle lip; h, olive green wine bottle shard. Provenience: a, Unit 19, 10-20 cm bs; b, Unit 3, 0-10 cm bs; c, Unit 5, 20-30 cm bs; d, Unit 19, 0-10 cm bs; e, Unit 5, 20-30 cm bs; f, Unit 1, 10-20 cm bs; g, Unit 6, 30-40 cm bs; h, ST 25, 20-40 cm bs.

Metal Artifacts

There is an assortment of miscellaneous metal artifacts in the Josiah W. Fort component. They relate to clothing items, personal items, utensils, and cook ware.

The clothing items include two brass buttons with shanks. One button (13.1 mm in diameter) has a floral pattern on the dome (Figure 25a), while the other button, slightly smaller (12.1 mm in diameter) is plain (Figure 26a). Other clothing-related metal artifacts are two iron straight pins from the top of Feature 1 (Unit 5, 20-30 cm bs). These pins are at least 40 mm in length and 1.4 mm in thickness (Figure 26b).

The one metal personal item is an ornately decorated brass handle remnant of a purse (see Figure 25c; see also Hahn et al. 2010:Figure 9.219). There are parts of two very thin (0.8 mm) silver plated spoon fragments from Unit 3 (0-10 cm bs) (see Figure 25d-e). The larger silver spoon fragment resembles a berry spoon (see Vaughn 1997:Figure 7-9b).

There are five pieces of cast iron cook ware in the 1836-1840 component. One piece (5.2 mm thick) may be from a cast iron kettle (see Figure 26e), but the others appear to be from a large pan or skillet with a defined and carinated rim about 24 mm in height (see Figures 25f and 26f). Four of the five pieces came from sheet midden or near midden deposits, but the possible kettle piece came from Unit 1 at the northern end of the site (see Figure 5).

An iron screw was recovered in Unit 3, and two iron roof tacks were found in Unit 5. Unidentifiable pieces of metal in the assemblage include: one iron rod; an iron bracket with holes; one iron pin; three thin iron strips and bands; one circular iron band; one iron latch; and two iron loops and a twisted metal loop fragment.

Cut and Forged Nails

There are 231 iron nails in the Josiah W. Fort artifact assemblage (see Table 1), found in two clusters in the component. Two are hand-forged (see Figure 26c-d), with elongated heads, while the remainder are cut nails of a type made between 1820-1891 in the United States (Wells 1998:Figure 8).

Of the cut nails that could be sized, about 46 percent were likely used for light framing and siding (8-10d) applications on a wood structure (Table 7), as well as used for rafters, ceilings, and flooring and to nail wall boards to the framing; neither of the hand-forged nails could be sized. Nails used for medium framing applications only account for 1.8 percent of the cut nails from the Josiah W. Fort component, and no heavy duty framing was done, while the remainder (2d-7d)—52.8 percent of the cut nails—would have been suitable for building a wooden shingle roof on a structure and for light

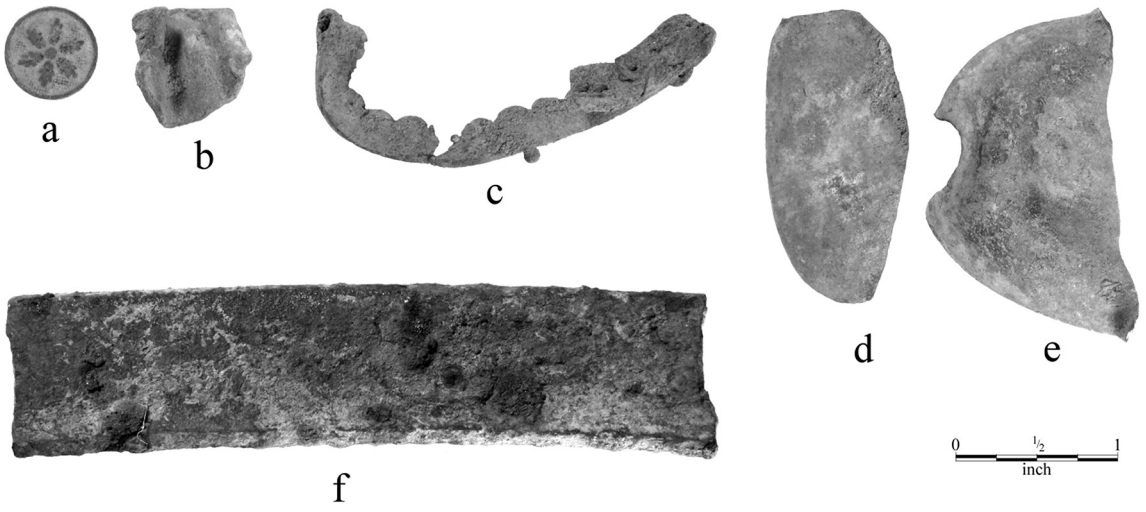

Figure 25. Metal artifacts from the Josiah W. Fort component: a, button; b, lead piece; c, decorative brass trim to a purse; d-e, silver spoon pieces; f, cast iron kettle rim. Provenience: a, Unit 4, 10-20 cm bs; b, ST 25, 0-20 cm bs; c, Unit 5, 20-30 cm bs; d-e, Unit 13, 0-10 cm bs; f, ST 26, 0-20 cm bs.

Figure 26. Additional metal artifacts from the Clear Creek site (41BW698): a, metal button; b, two straight pins; c-d, hand-forged nails; e, cast iron kettle piece; f, cast iron kettle rim. Provenience: a, Unit 5, 50-60 cm bs; b, Unit 5, 20-30 cm bs; c, Unit 5, 50-60 cm bs; d, Unit 20, 0-10 cm bs; e, Unit 1, 0-10 cm bs; f, Unit 5, 20-30 cm bs.

Table 7. Nail sizes for the machine cut nails.

Nail sizes (d)	Number	Percentage
2d	1	1.8
3d	7	12.3
4d	3	5.3
5d	5	8.8
6d	9	15.8
7d	5	8.8
8d	17	29.8
9d	6	10.5
10d	3	5.3
20d	1	1.8
Totals	57	100.0

framing tasks within the structure. The 2-3d nails may also have been employed as light sheathing and wallpaper nails in the structure. A peak in the frequency of 6d nails may also mark their use for wall boards and wainscoting (see Jurney 1987).

As mentioned earlier, the distribution of cut nails and window glass shards (see Figure 7b) suggest that a wood structure, apparently a double pen dogtrot, in the Josiah W. Fort component stood 5-15 m east of the sheet midden deposits. The structure's mudcat chimney probably stood along the western wall of the house.

Window Glass Shards

Other architectural remains from the Josiah W. Fort component includes aqua-colored window glass shards (n=7) and clear window glass shards (n=3). The Fort homestead had at least two different colors of glazed windows. The mean thickness of the window glass is 1.35 mm, which suggests the glass was made in 1826 ± 7 (1819-1833) (Moir 1987:Table 5-4). If the mean glass thickness measurements are accurate, and Moir's temporal seriation is reasonable, this further suggests that the window glass panes may have been brought from Tennessee to Texas by the Fort family.

Gunflints

The use of flintlock muskets by the Josiah W. Fort family during the occupation is indicated by the recovery of three gunflints (Figure 27) from units 5 (in midden deposits above Feature 1) and 13, about 22 m to the east. All are English fine grade snap-blade gunflints (Kenmotsu 2000:Figure 7; Hahn et al. 2010:Figure 8-1).

Two of the gunflints are made from a dark grayish-brown chert (see Figure 27a-b). They have rectangular backs, each with two working edges. Measurements from the working edge to the heel ranges from 15.5-17.0 mm (see Figure 27a) to 16.0-20.5 mm (see Figure 27b). The smaller of these flints may have been for use with a pistol, but the larger flint would have been used with a rifle or musket.

The third gunflint, made from a light gray, fossiliferous chert, is fragmentary, broken along one of the sides (see Figure 27c). It is rifle-sized, with one working edge; it measures 20.0 mm from the working edge to the heel, and 21.0 mm side to side.

Lead Artifacts

There are several lead artifacts from the Josiah W. Fort component. The first is a 0.50 caliber lead ball (12.7 mm in diameter) that would have been used in a muzzle-loading musket (Figure 28a). According to Branstner (2008:170), a 0.50 caliber lead ball would have been used with a large bore weapon that "could fire powerful, accurate loads at the longer distances" in pursuit of large-sized game as well as for personal defense.

Two other lead artifacts are pieces of sprue from Feature 1 in Unit 5 from the on-site manufacture of lead balls (see Figure 28b-c). The sprue range in weight from 3-80 g, and in dimensions from 27-49 mm in length, 14-55 mm in width, and 2-5.8 mm in

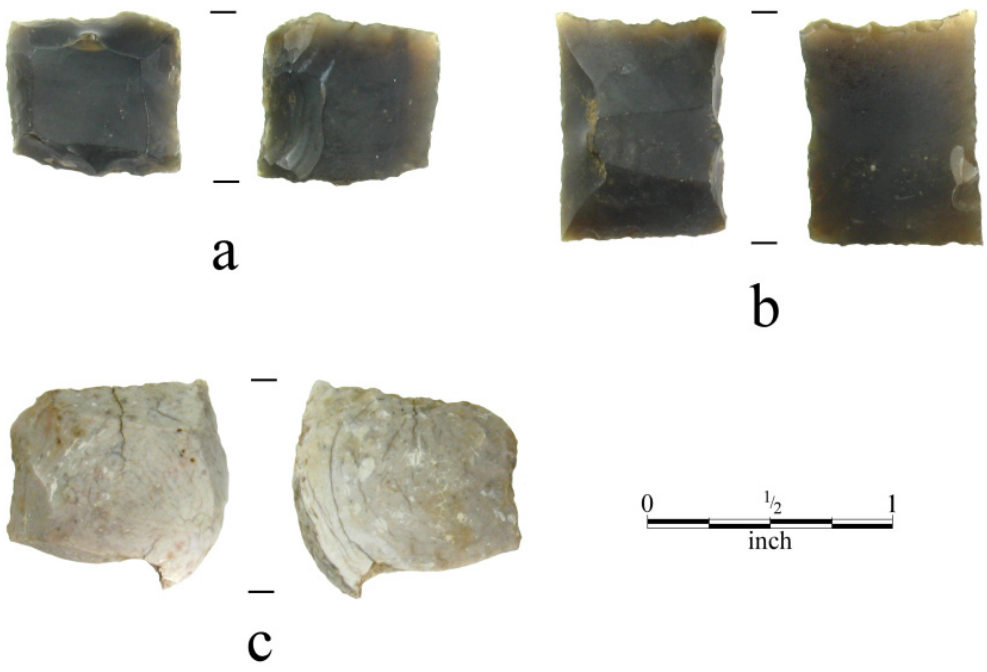

Figure 27. Gunflints. Provenience: a, Unit 5, 0-10 cm bs; b, Unit 5, 10-20 cm bs; c, Unit 13, 0-10 cm bs.

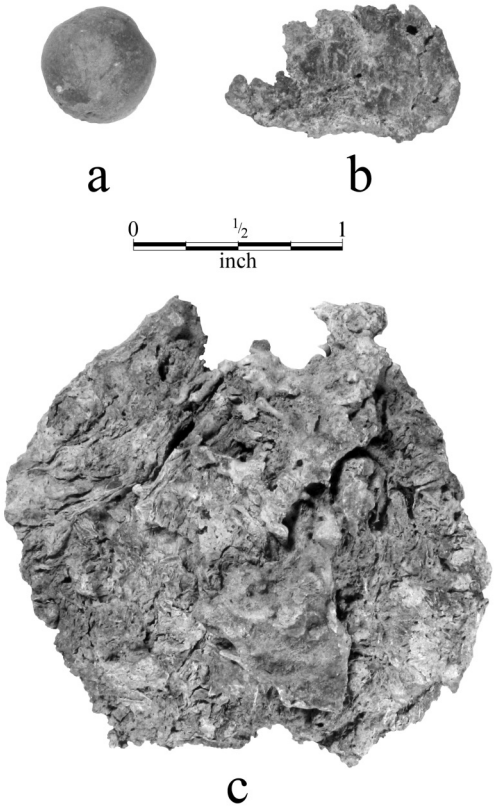

Figure 28. Lead artifacts: a, lead ball; b-c, lead sprue. Provenience: a, Unit 7, 30-40 cm bs; b, Unit 5, 60-70 cm bs; c, Unit 5, 30-40 cm bs.

thickness. The final piece is a folded piece of lead from ST 25 in the sheet midden (see Figure 25b). The piece is 17 x 16 x 4 mm in length, width, and thickness, and its use is unknown.

Glass Beads

There are two glass beads that were found in the 1836-1840 archeological deposits. Both are typical of early to mid-19th century beads (ca. 1800-1850) found on sites in North America. The first is a drawn six-sided translucent blue Bohemian bead (Figure 29a), in which a rod of glass was passed through a six-sided mold or form to create the sides, then ground at each end to create the other rows of facets (Billeck 2010:24-25). The bead is 6.0 mm in diameter and 4.5 mm in length. It would be classified as a type If or IIIf bead in the Kidd and Kidd (1970) bead classification system.

The second bead is a Venetian wound tubular bead with a translucent red exterior and an opaque white interior (see Figure 29b). It has parallel sides and flat, ground, ends. The bead is approximately 12.2 mm in length and 7.2 mm in diameter.

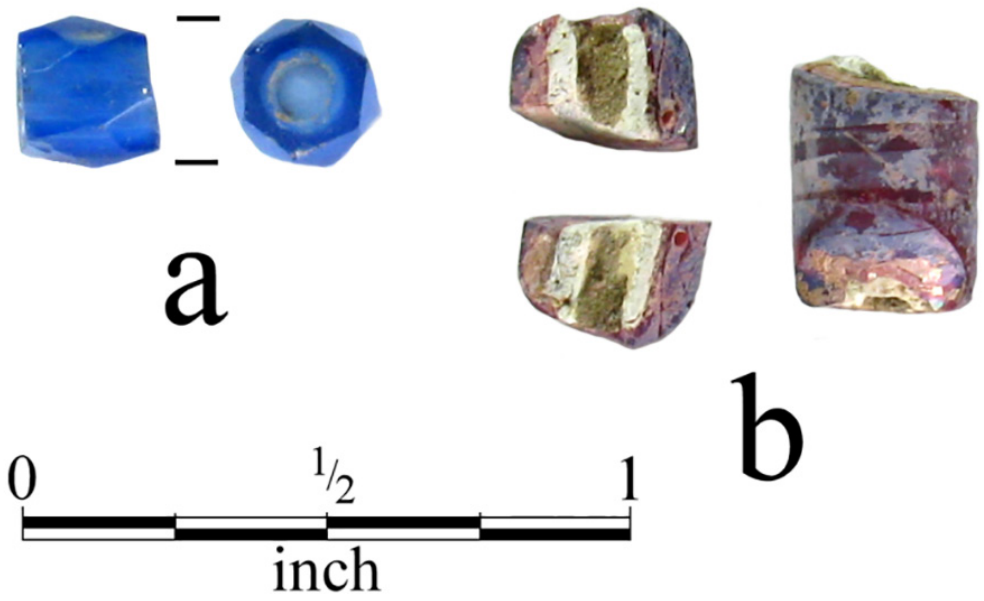

Figure 29. Glass beads. Provenience: a, Unit 7, 10-20 cm bs; b, ST 23, 0-20 cm bs.

Slate Pieces

Four small pieces of a slate board were found in Unit 5 (Feature 1) deposits. The pieces, ranging in size from 11-22 mm in length, 10-13 mm in width, and 1-2.5 mm in thickness, are flat and smoothed on both surfaces. The largest piece has several straight etched lines on one surface, suggesting it may have come from a ruled slate board.

Burned Clay Pieces

Burned clay pieces are one of the principal constituents of the archeological deposits in the Josiah W. Fort component. A total of 7846 pieces, mostly sub-rounded and oxidized, weighing 21.17 kg, were recovered in the shovel testing and hand-excavated units, with the vast majority of the burned clay pieces deriving from Unit 5, SS64, and Feature 1 (in both Unit 5 and SS 64) (Table 8).

Table 8. Distribution of burned clay pieces in the Josiah W. Fort component.

Provenience	No.	Weight (in g)
ST 6	5	1.4
ST 11	2	0.2
ST 23	18	29.4
ST 25	48	66.2
ST 26	11	7.2
ST 45	1	0.3
ST 59	1	0.7
SS 64	322	288.2
Unit 1	11	3.1
Unit 3	21	12.4
Unit 4	5	15.3
Unit 5	6829	20634.7
Unit 6	65	93.7
Unit 7	8	4.5
Unit 8	2	0.9
Unit 10	1	3.6
Unit 11	2	4.9
Unit 13	3	0.7
Unit 14	18	6.4
Unit 15	5	1.1
Unit 16	12	9.5
Unit 17	1	0.3
Unit 18	3	4.2
Unit 19	17	31.1
Unit 20	36	44.0

These many burned clay pieces are likely the remnants of a mudcat chimney, a chimney built of a framework of sticks or boards that was covered with a thick deposit of clay called "mudcats" (Jordan 1978). The straight and horizontal impressions on some of the burned clay pieces represent pieces of clay that had been pushed up against sticks and boards during chimney construction, and the impressions subsequently preserved when the mudcat clay was burned. Since such chimneys readily caught fire, they were typically built slightly out from the house or cabin, and could then be knocked over if they began to burn. The many pieces of burned clay in Unit 5, SS 64, and Feature 1 suggest that a mudcat chimney had been knocked over and the pieces deposited in the Feature 1 pit. Since no chimney foundation was identified in the test excavations, it is not known if the mudcat chimney was originally set near Feature 1, or at some distance from it.

Summary and Conclusions

The focus of the archeological investigations at the Clear Creek site was to attempt to comprehend the character of this singular early to mid-19th century site in the uplands above the Red River bottomlands in northeastern Texas. The Clear Creek site represents the original homestead of the Josiah W. Fort family on their 1280 acre headright lands, and the family remained at this place for only about four years (1836-1840). After they became established in the area, they then moved to new lands a few miles away in Myrtle Springs, and established a larger plantation more suitable for the production of cotton. Consequently, archeological deposits of the Josiah W. Fort family at the Clear Creek site represent the material remains of a house and other features that were present and in use for only a moment in time, along with the range of artifacts used and discarded in the context of everyday life of a prosperous planter, as well as the use of space and landscapes by the household, particularly the intra-site use of yard space.

Structural and architectural information obtained during the archeological investigations at the Clear Creek site indicate that a wood house was present at the Josiah W. Fort component, although no foundation was found in the limited test excavations. The house was constructed of logs, with wood framing, using cut nails, and had at least two windows. Archival information

indicates that the house was a double pen dogtrot. An associated concentration of burned clay pieces strongly suggests that there was a mudcat chimney at one end of the house; the many burned clay pieces also suggest that the chimney had been dismantled or collapsed at least once, many of the pieces ending up in a large pit feature (Feature 1) to the west of the house area. No other important household features (i.e., wells, privies, cellars, smokehouses, etc.) were located in the Josiah W. Fort component, although two large pit features and a sheet midden deposit were identified in a yard area to one side and down slope from the postulated house location. The pit features contained a dark and organically-stained fill, and some quantity of plant remains and discarded animal remains, suggesting they were used for trash disposal, but their original functions are unknown; they were likely used during the course of outdoor yard activities, perhaps for outdoor cooking. The sheet midden deposit represents the yearly accumulation of household trash, organic remains, ash, and discarded artifacts in an immediate yard area to one side of the house. The yard was probably swept or periodically maintained by the family slaves.

The material culture remains recovered in the 1836-1840 Josiah W. Fort component, particularly the range of refined earthenware plates and cups, provide useful clues about the economic status of the Fort family. The high proportion of pearlware and whiteware transfer-printed wares, as well as some flow blue and porcelain sherds, are indicative of a prosperous family that had access to the highest priced ceramic sets, even while they were living in a rural part of East Texas.

Use of Space and Site Planning

The use of space at the Clear Creek site by the Josiah W. Fort household concerns the spatial distribution of material culture remains across the archeologically defined component, as determined by the family's perception and use of space. There are distinct activity areas or occupational deposits within the component, marked primarily by the existence of discrete artifact disposal locations (see Figure 7a), concentrations of architectural remains (i.e., nails, window glass, and burned clay pieces) in two different clusters, and the distribution of non-structural features (i.e., sheet midden deposits and large pits within the sheet midden) across the site. The postulated placement of a wood building, the Fort family residence from 1836-1840, on a slightly elevated and flat part of the upland landform, is matched by the location of a small yard sheet midden deposit (i.e., yard refuse) to one side of the residence (i.e., the active and maintained yard) and on a gentle slope leading towards the Clear Creek floodplain (see Figure 7b).

At a broader geographic scale, the Josiah W. Fort family residence was situated near to the Jonesboro road, which crossed roughly north-south across his 1280 acre headright lands (see Figure 3). This allowed easy access for plantation wagons to carry cotton and other goods from his property to White Oak Shoals on the Red River, where it would have been loaded on steamboats for shipping to Shreveport and New Orleans. The house was also close to Trammel's Trace, which would have been used for cotton hauling to Caddo Lake ports and Shreveport when the upper Red River was inaccessible to steamboats (Bagur 2012:20-21).

Material Remains and Social and Economic Status

The material remains found in the Josiah W. Fort archeological component at the Clear Creek site reflect access to, and utilization of, particular types of goods as well as the types of everyday activities and daily practices carried out by the family at the site. These remains are informative about the social and economic positions of the occupants in relationship to East Texas and later Texarkana communities. The cost and diversity of refined earthenware ceramics in the component appear to correlate with known social and economic patterns of planters and small landowners in antebellum (1836-1840) East Texas, as well as with the available archival information on the Fort family.

The most distinctive characteristic of the pearlware and whiteware ceramics recovered in the Josiah W. Fort component is that transfer-printed ceramics, one of the more expensive ceramic wares produced at the time other than porcelain, account for 73 percent of the decorated sherds in the component. Other expensive wares include a few sherds of porcelain and flow blue whiteware. The cost or CC Index (e.g., Miller 1991) for the Josiah W. Fort assemblage (3.21) is comparable to merchants and planters in other parts of the United States who had access to higher priced ceramic sets. The high relative frequency of decorated vessels in the Josiah W. Fort component, the

dominance of plates and cups, and the overall great abundance of transfer-printed wares in the assemblage corroborate archival records and tax rolls: the Josiah W. Fort component represents the settlement of a very affluent plantation and slave owner, an owner that continued to be financially successful, increasing his land (to more than 5000 acres) and slave (more than 60 slaves) holdings, up to the time of his death in 1859. A typical slaveholding farmer in antebellum Texas owned 10 slaves (in 1860) and 905 acres of improved and unimproved land (Lowe and Campbell 1987:80-82).

Subsistence

Preserved plant or animal remains recovered from features and midden deposits in the Josiah W. Fort component provide insights into the subsistence practices of the Fort family (Bush 2012; Schniebs and Perttula 2012). Plant remains include corn and squash, and corn was likely the staple crop; a garden was probably used to grow vegetables for family use such as sweet potatoes and cabbage (see Campbell 2003:209). Meat came primarily from pigs and cattle, along with wild game obtained during hunting and fishing, and the family likely had a few milk cows. Crops and meat also had to be grown and raised for Fort family slaves, and it is likely that slave labor was employed for that purpose as well as for the food produced for the use of the Fort family.

Cotton Production

As a planter, even though the family had only recently arrived in Texas from Tennessee, Josiah W. Fort brought 40 slaves to Texas in 1836, and undoubtedly he had cotton planted with slave labor in the late winter of 1836 as his first cash crop in Texas. The resulting harvest of cotton during the summer of 1837 would have been bundled for sale, then shipped down the Red River on a steamboat, or brought overland to Shreveport (and then by the early 1840s, to ports on Caddo Lake and the city of Jefferson). That the Fort family was successful in producing sizable cash crops of cotton is shown by the 1846-1859 tax rolls (see Perttula et al. 2012:Appendix 2), that indicate that Josiah W. Fort continued to purchase more slaves and land for his Red River plantation. As Campbell (2003:210) notes, "Slaveholding farmers and planters were earning returns [more than 6 percent] comparable to those they would have received for putting their money into business loans in a northeastern city."

For the Fort family during their occupation of their original headright lands between 1836-1840, it was important to have the slave labor available to produce subsistence items for the family and their 40 slaves, but that was balanced by the use of that same labor in the production of cotton as a cash crop for the market system. The latter drove the economy of the region, and the successful economic pursuits of the Fort family depended upon slave labor and bountiful Red River bottomlands to produce yearly cotton crops.

In conclusion, archeological test investigations, along with supporting archival and historical research, at the Clear Creek site (41BW698) were conducted in January 2012 prior to the proposed development of a sports complex on the campus of Texas A&M University-Texarkana. The work focused on the 1836-1840 Josiah W. Fort component, and these test excavations identified intact archeological deposits that covered a maximum ca. 68 x 40 m area. The main occupational remains believed to be associated with the Josiah W. Fort family are concentrated in a smaller (ca. 36 x 20 m) archeological deposit that includes a yard sheet midden, two large pit features (in the sheet midden), a dense concentration of burned clay pieces from a dismantled/destroyed mudcat chimney, and two distinct clusters of material culture remains, especially transfer-printed ceramic sherds and cut nails. The nature of archeological deposits indicates that the sheet midden accumulated not far to the west of a house structure (the original structure built by the Fort family in 1836), likely a double pen log cabin with wood framing, that had a mudcat chimney (apparently framed with pine wood and sticks).

Household material goods found in the Josiah W. Fort component are whiteware and pearlware ceramic sherds from plates and cups; stoneware vessels; glass sherds from bottles that held liquids and medicines; glass tableware and decorative pressed glass; gunflints, lead balls, and the sprue from making bullets on-site; metal buttons; and many nails and pieces of window glass from the construction and use of wood structures. Several of the artifacts found in the Josiah W. Fort component are more personal items, such as silver plated

spoon fragments, metal clothing buttons, straight pins for sewing, glass beads, and part of a brass handle to a purse. The range of artifacts, from domestic to structural/architectural, as well as the abundance of certain kinds of artifacts (i.e., expensive transfer-printed ceramics), reflect the fact that a prosperous farming household lived at the site. The availability of goods for purchase was no doubt enhanced by the Fort family's position as a prominent plantation owner at the time they arrived in Texas, and their prominence only increased in the years leading up to the time of the Civil War.

One of the more distinctive characteristics of the Josiah W. Fort component is the pearlware and whiteware ceramic assemblage. The high relative frequency of decorated vessels in the Josiah W. Fort component, the dominance of plates and cups, and the overall great abundance of transfer-printed wares in the assemblage corroborate the archival records and later tax rolls in that the Josiah W. Fort component represents the settlement of a very affluent plantation and slave owner, an owner that continued to be financially successful up to the time of his death in 1859.

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SMALL SITE ARCHEOLOGY: 41GL129, A FLAKE CACHE SITE IN GILLESPIE COUNTY, TEXAS

Carey D. Weber

In 1985 a survey of the upper Meusebach Creek watershed in Gillespie County, Texas identified and recovered a small flake tool cache during an intensive surface collection from 41GL129. Analysis and comparison of artifacts within the site area and with results of experimental flint knapping to reduce bifaces indicate that the site functioned as a temporary, one-time hunting and/or raw material procurement campsite for multiple groups of people. Identification of raw materials from which the artifacts were made indicates that the groups traveled within a foraging range that included the upper main stem of the Pedernales River and Meusebach Creek. Diagnostic projectile point types recovered from the site span most of Texas prehistory. A group of 19 flake tools are interpreted as a cache that had been part of a lithic tool kit procured and used along a travel route from the upper Pedernales River downstream and up Meusebach Creek to the site. Previously published dates for geological sediments in the Pedernales River valley near its confluence with Meusebach Creek, and comparison of the cache with three previously reported flake caches, indicate that the cache was most likely deposited during the Late Archaic period (4000-1200 years B.P.).

Overview of Previous Research on Flake Caches in Texas

Miller (2007:1) notes that most studies of caches have been limited to the cache structure and content, and that larger scale studies, including geographic area, raw material sources, related archeological sites, and comparison to other caches are not only possible, but also useful for a more complete understanding of caching behavior. Miller (2007:13) also provides an excellent review of various types of caches found in Texas, noting over 20 flake caches from Central and West Texas. He briefly describes six of these, including the Brookeen Creek Cache from Hill County. Excluding Paleoindian blade/flake caches, three detailed reports are readily available and are considered to be representative of flake caches in Central Texas and the Panhandle; the Gibson cache (Tunnell 1978), the Brookeen Creek cache (Mallouf 1981), and the Alibates cache (Flaigg 2002). In addition, the Gibson and Alibates cache reports present information on other caches in the region.

In 1956 or 1957 Curtis O. Tunnell and Bruce Gibson found the Gibson cache in a quarry site on Oak Creek in Coke County, Texas. The cache consisted of 72 large flakes produced from prepared cores that were eroding from a small basin-shaped depression. The flakes had apparently been quarried at the location and then stacked neatly within the depression and stored for future recovery and use. The raw material from which the flakes were made occurs naturally at the site. Curtis D. Tunnell's report (1978) on the cache provides detailed attribute data, illustrations, and photographs. Several flakes from the same cores were refitted, prehistoric behaviors likely associated with the cache were documented, and the cache was compared with others in the west central and Panhandle areas of Texas.

Robert Mallouf and Barbara Baskin discovered the Brookeen Creek cache in 1976 during an archeological survey for a proposed Soil Conservation Service flood damage reduction structure on Brookeen Creek, an upper tributary of Tehuacana Creek, in Hill County, Texas, within the Blackland Prairie eco-region of Texas. The cache consisted of 173 (Mallouf 1981:v, 50) flakes, 76 of which were whole or reconstructed, buried in the floodplain adjacent to Brookeen Creek. The cache was an isolated find that is not in association with an occupation or quarry site. Mallouf's report (1981) focuses on fractures produced by plowing, and additional flake attribute data are lacking. While the raw materials from which the flakes were made are generally identified as Edwards chert, a more precise source is unknown. The flakes were obtained some 50 miles southwest (Mallouf 1981:9), 37 miles according to Miller 2007:14), from the

site where they were found. A photo of the cache (Mallouf 1981:Frontispiece) shows the flakes to be generally untrimmed and not used as tools.

National Park Service personnel recovered the Alibates cache in 1982 from an apparent prehistoric storage feature within a Panhandle Aspect village site in Potter County, Texas, after it had been partially exposed by collectors. The cache consisted of 331 flakes and flake fragments, a Fresno arrow point, six Borger cord-marked sherds, an antler billet, an antler fragment, 10 bone fragments, a vial of small, unidentified bone fragments, two bison teeth, and two tiny fragments of mussel shell. Flaigg's report (2002) provides detailed attribute data organized by flake termination type. Several flakes from the same cores were refitted, and the report notes that some flakes were removed from prepared cores, while most were removed from bifaces. True to its name, the raw material from which the flakes were made apparently is from the Alibates Flint Quarry or a nearby outcrop, and was transported approximately 1.5 miles to the site where the cache was found.

Site 41GL129

Site 41GL129 is an exposed, eroding open campsite located on a tributary of Meusebach Creek near its confluence with the main stem (Figures 1 and 2). The site is located near the geographic center of the Meusebach Creek watershed, approximately 2.9 miles below the divide and 4.8 miles above the confluence with the Pedernales River at about 1725 feet above mean sea level. The site is situated along the south bank of the tributary, a short distance from the bottom slope of a high hill. The soil is classified as Purves in the Gillespie County soil survey (Allison et al. 1975). At the site, the soil is a shallow, light-colored sediment that overlays eroded limestone and marl strata. A thin scattering of artifacts was present on the surface, and some occur at a minimal depth; a small number of artifacts are exposed with each heavy rainfall event.

When the site was discovered in 1985 during a survey of the upper Meusebach Creek watershed, the area was intensively examined in an attempt to identify and collect every exposed artifact. No shovel tests were performed. Locations of the individual artifacts were not plotted on a grid, although they should have been. A subsequent trip was made later in the year to collect any other artifacts that may have been missed or subsequently exposed. Only 80 artifacts were recovered from the site on both visits. The surface collection from the site showed that the site covers approximately 2150 square meters, and identified a concentration of artifacts near the south-eastern end of the site, as well as an obvious 9 square meters circular concentration comprised of only 19 large flakes near the center of the site (see Figure 2). While they were not buried together when found, but scattered in a very concise area on the eroded surface, I interpret this group of flakes to be a flake cache due to similar manufacturing and utilization techniques, a similar lack of patination, the small area of deposition, lack of other artifacts within the area of deposition, the very small number of total artifacts at the site, and the selection and use of raw materials obtained from sequential sites along a direct travel route that followed stream channels to the site. The term "cache" as used in this interpretation is the same as Miller's (2007:7) in that it does not necessarily imply that the owner intended to recover the materials. In addition to a detailed description of the cache contents, this study provides an interpretation of the larger scale aspects of the cache.

Description of Flake Cache

Nineteen flakes (17 whole and two broken) comprise the flake cache (Figures 3 and 4). Data for individual flakes are shown in Table 1. The raw material of at least 10 of the flakes still showing cortex (129-2–129-9, 129-11-12) was obtained in the form of rounded gravel cobbles that occur in gravel bars in the stream bed of the Pedernales River and which average approximately 260 x 200 x 110 mm in size. 129-1 retains no cortex to indicate whether the parent core was obtained from a streambed or an upland source; however, the Tivydale material from which it is made occurs in both. Raw material for 129-11–12, 129-14, and 129-16–19, may have also been found in the gravel bars of Meusebach Creek. 129-13 is a lobe off of an irregularly rounded, but not stream worn nodule, and 129-15 is irregular in shape and was produced by removing the corner edge of a blocky, coarse ledge chert known to occur on the hills immediately above and adjacent to the site. Several of the flakes appear to have come from the same cores; however, none of the facets match. At least 11 different cores are represented in the raw material.

Figure 1. Locale of 41GL129.

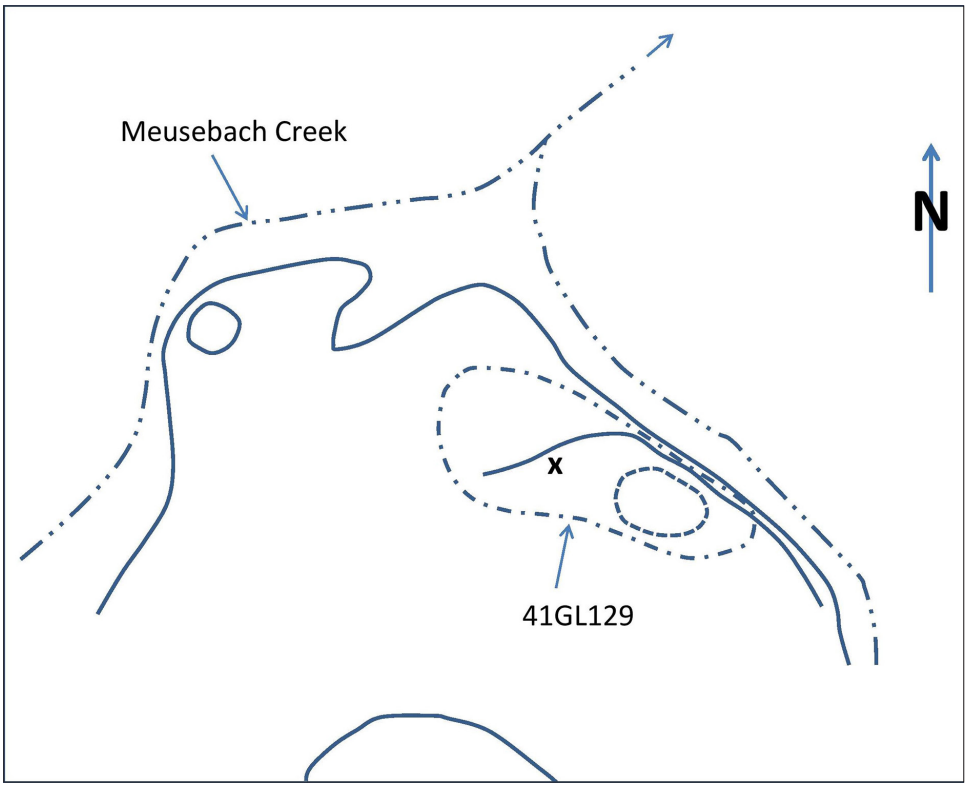

Figure 2. Topographic map of 41GL129. Dotted line is the area of concentrated artifacts. X indicates the flake cache location.

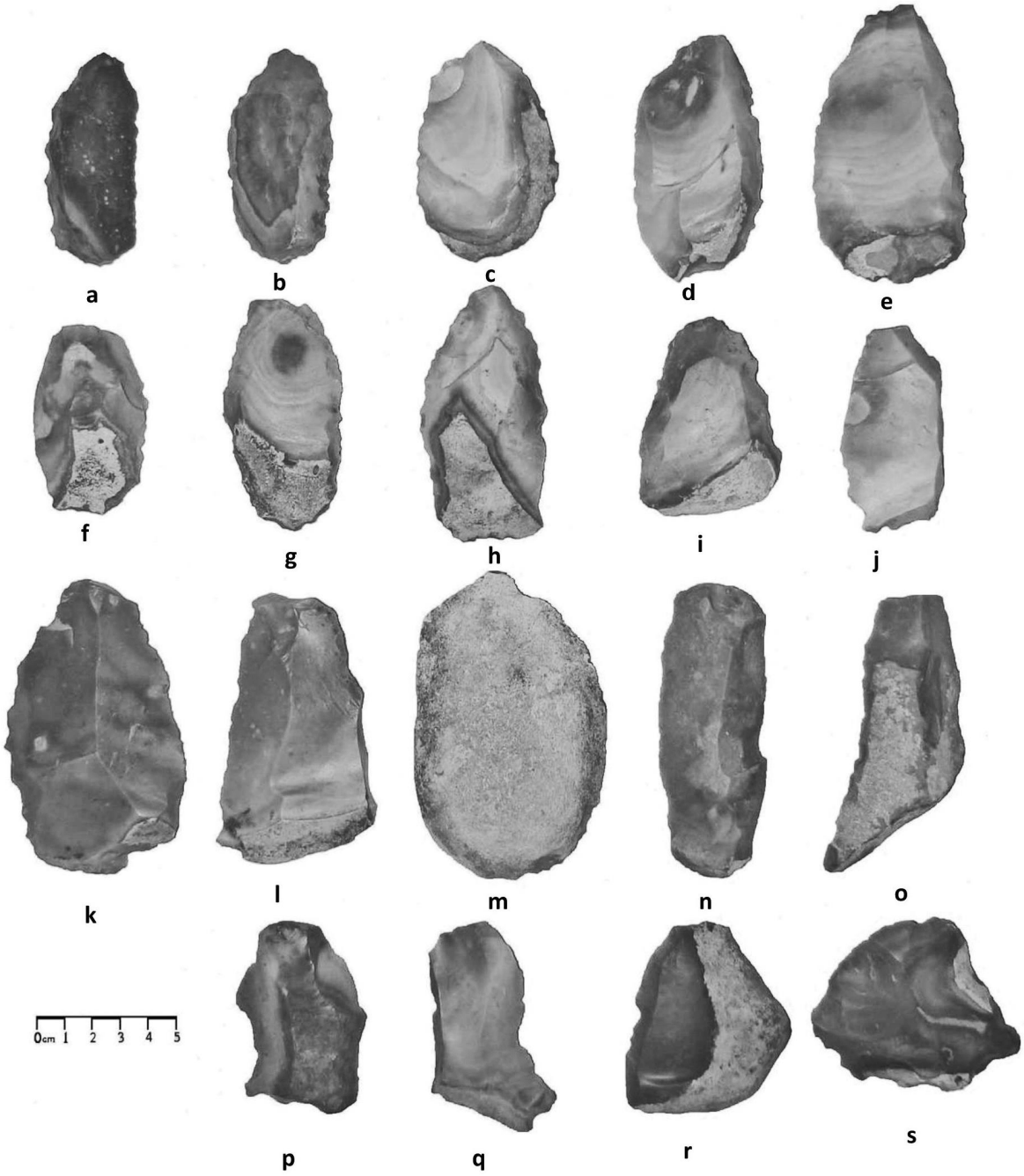

Figure 3. Dorsal surfaces of cache flakes from 41GL129. a-s, 129-1–129-19. Top row, left to right: 129-1-5; second row, left to right: 129-6-10; third row, left to right: 129-11-15. bottom row, left to right, 129-16-19.

By tracking the raw material, the most distant source (129-1) is near Tivydale, Texas, 22.4 river miles from 41GL129, and the second most distant (129-2-129-11) is 6.75 river miles from 41GL129, showing movement down the Pedernales River and up Meusebach Creek to 41GL129. The flakes are not greatly shortened from their original size. All, except perhaps 129-13 and 129-15, were made from cores specially prepared to produce such flakes. All except 129-13, which is a primary flake, are secondary flakes (n=16) or sub-cortex interior flakes (n=2), indicating sequential removal.

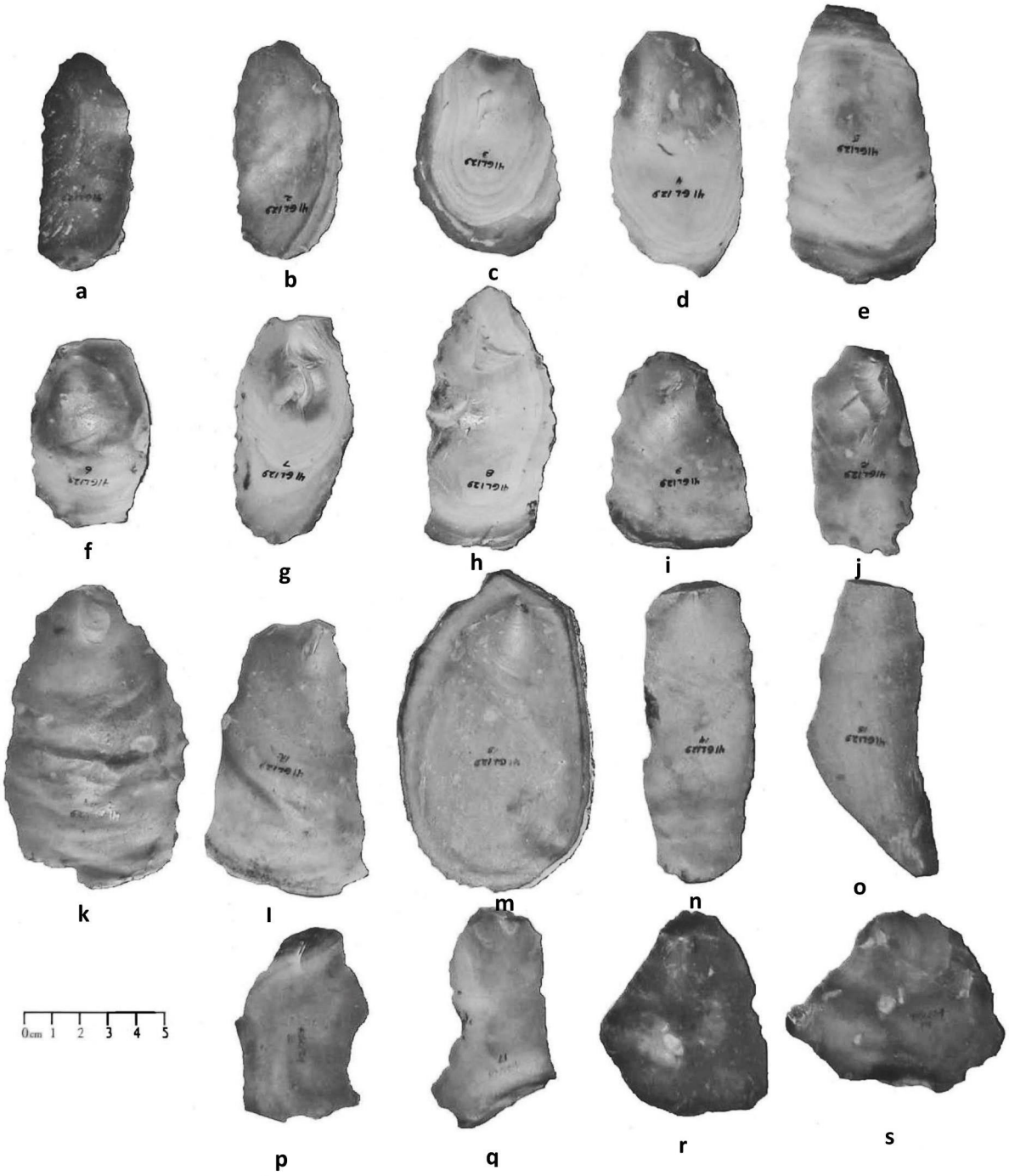

Figure 4. Ventral surfaces of cache flakes from 41GL129. a-s, 129-1–129-19. Top row, left to right: 129-1-5; second row, left to right: 129-6-10; third row, left to right: 129-11-15; bottom row, left to right, 129-16-19.

Seven of the 19 flakes, 129-12 and 129-14-129-19, are mostly unmodified since they were detached from the core. Two, 129-15 and 129-19, are missing the proximal end. After 129-1-129-11 and 129-13 were removed from the core, they were reflaked on one lateral edge and the distal edge (129-3, 129-4, 129-6, and 129-10) or both lateral edges (129-8 and 129-9), two lateral edges and the

Table 1. 41GL129 Flake Attributes (N=39).

No.	mm2	Fragment	Length	Width	Thic	Thic	Platform/ Ring Crack	Reflaked Left	Reflaked Right	Reflaked Distal	Proximal	x	Cortex Remanant	d	Pitted	L PATINA	AL	Mean Patina	Patina d	Material	NOTES	ARTIFACT CATEGORY
1	45-50	I	80.0R	33.2	14.5	11.2	-	beveled	unifacial	beveled	unifacial	I		No	No	0.0	0.0	0.0	No	Tivydale dark gray	flake knife cache; platform reflaked	LFBT>45 mm.
2	50-55	I	80.0R	38.5	16.2	13.1	-	beveled	beveled	beveled	beveled	S		No	No	0.0	0.0	0.0	No	Ped Gray cobble	flake knife cache; platform reflaked	LFBT>45 mm.
3	55-60	I	80.1	52.0	9.5	9.5	2.9	beveled	unifacial	unifacial	-	S		No	No	0.0	0.0	0.0	No	stream cobble; same as 4-12	flake knife cache	LFBT>45 mm.
4	55-60	I	91.5	47.0	16.2	14.2	Normal	unifacial	beveled	beveled	-	S		No	No	0.0	0.0	0.0	No	same as 3, 5-12	flake knife cache	LFBT>45 mm.
5	65-70	I	104.1	55.0	14.9	12.0	Normal	beveled	beveled	-	-	S		No	No	0.0	0.0	0.0	No	same as 3-4, 6-12	flake knife cache; platform reflaked	LFBT>45 mm.
6	50-55	I	68.5	42.5	15.9	15.9	5.7	utilized	beveled	unifacial	-	S		No	No	0.0	0.0	0.0	No	same as 3-5, 7-12	flake knife cache	LFBT>45 mm.
7	55-60	I	83.4	43.7	14.0	11.3	-	beveled	unifacial	unifacial	-	S		No	No	0.0	0.0	0.0	No	same as 3-6, 8-12	flake knife cache	LFBT>45 mm.
8	55-60	I	91.8	45.4R	15.4	10.2	-	beveled	unifacial	-	-	S		No	No	0.0	0.0	0.0	No	same as 3-7, 9-12	flake knife cache	LFBT>45 mm.
9	50-55	I	70.5	51.7	16.2	16.2	Normal	beveled	beveled	-	-	S		No	No	0.0	0.0	0.0	No	same as 3-8, 10-12	flake knife cache	LFBT>45 mm.
10	50-55	I	75.6	39.2	8.9	8.0	Normal	u-notch	utilized/unifacial	beveled/u-notch	-	I		No	No	0.0	0.0	0.0	No	same as 3-9, 11-12	flake knife cache	LFBT>45 mm.
11	75-80	I	106.5	65.2	16.5	16.5	5.1	unifacial/u-notch	utilized	unifacial/u-notch	-	S		No	No	0.0	0.0	0.0	No	same as 3-10, 12	flake knife cache	LFBT>45 mm.
12	65-70	I	96.2	57.2	16.5	10.0	2.1	u-notch utilized	u-notch/unifacial	-	-	S		No	No	0.0	0.0	0.0	No	sames as 3-11	flake knife cache	LFBT>45 mm.
13	75-80	I	111.2	67.6	26.3	22.2	3.0	-	-	unifacial	-	P		No	No	0.0	0.0	0.0	No	nodule	flake knife cache	LFBT>45 mm.
14	55-60	I	104.4	38.4	16.5	13.3	6.0	utilized	utilized	unifacial	-	S		No	No	0.0	0.0	0.0	No		flake knife cache; blade-like	LFBT>45 mm.
15	55-60	D	132.0	38.5	17.6	-	-	unifacial	-	-	-	S		No	No	0.0	0.0	0.0	No	stream-rolled ledge chert	flake knife cache; proximal end broken off	LFBT>45 mm.
16	50-55	I	70.2	46.4	18.0	13.4	Normal	u-notch	beveled/unifacial	u-notch	-	S		No	No	0.0	0.0	0.0	No	stream cobble; same as 17	flake knife cache	LFBT>45 mm.
17	45-50	I	76.3	44.4	8.0	5.9	Normal	utilized	u-notch/utilized	-	-	S		No	No	0.0	0.0	0.0	No	stream cobble; same as 16	flake knife cache	LFBT>45 mm.
18	55-60	I	70.4	60.0	18.5	-	-	unifacial	-	unifacial	-	S		No	No	0.0	0.0	0.0	No	stream cobble	flake knife cache; platform reflaked	LFBT>45 mm.
19	55-60	D	-	63.0	16.9	16.7	5.6	unifacial	unifacial	unifacial	bifacial	S		No	No	0.0	0.0	0.0	No	stream cobble	flake knife cache; platform reflaked	LFBT>45 mm.
20	50-55	I	65.0	62.7	14.5	-	-	unifacial	bifaced	-	bifacial	S		No	No	0.0	0.0	0.0	No	local ledge cobble	ventral face bifaced; platform remnant	LFBT>45 mm.
21	35-40	I	47.2R	35.3R	12.7	-	Lipped	u-notch	u-notch	u-notch	-	S		No	No	0.0	0.0	0.0	No		4 notches	PRFT<45 mm
22	40-45	I	44.6R	52.5	9.2	9.2	5.3	graver/utilized	unifacial	beveled	-	I		No	No	0.0	0.0	0.0	No		-	IFT<45 mm.
23	35-40	I	51.1	38.1	7.3	7.3	Lipped	-	-	-	-	I	subcortex	No	No	0.0	0.0	0.0	No	same as 3-12, 65	-	IF<45 mm.
24	30-35	M	-	-	7.9	-	-	-	-	-	-	I		No	No	0.0	0.0	0.0	No		reflaked, 1 burin	IF<45 mm.
26	35-40	I	45.2	44.6	11.0	11.0	Normal	unifacial	unifacial	-	-	S		No	No	0.0	0.0	0.0	No		platform moderate light patina - partial lip but hard hammer flake-	PRF<45 mm.
27	35-40	I	50.4R	43.9R	14.5	-	-	bifaced	bifacial	bifacial	bifacial	I		No	No	0.0	0.0	0.0	No			IFT<45 mm.
28	30-35	D	-	-	8.2	-	-	-	-	-	-	P		No	No	0.0	0.0	0.0	No		-	PRF<45 mm.
29	25-30	I	-	25.0	5.1	4.5	Normal	unifacial	unifacial	-	-	I		No	No	2.0	2.0	2.0	No		-	IFT<45 mm.
30	25-30	I	43.3	27.5	8.6	8.6	4.2	unifacial	unifacial	-	-	I		No	No	0.0	0.0	0.0	No		-	IFT<45 mm.
31	25-30	I	38.9	33.2	7.4	6.5	Lipped	unifacial	-	unifacial	-	I		No	No	3.0	1.0	2.0	No		-	IFT<45 mm.
32	20-25	P	-	25.0	7.0	7.0	Lipped	utilized	-	-	-	I		No	No	2.0	3.0	2.5	No		-	IFT<45 mm.
33	15-20	M	-	24.3	4.0	-	-	-	-	-	-	I		No	No	3.0	1.0	2.0	No		-	IF<45 mm.
34	25-30	I	-	29.5	6.3	4.6	-	-	unifacial	-	-	I	subcortex	No	No	0.0	0.0	0.0	No		-	IFT<45 mm.
36	20-25	D	-	35.1	8.1	-	-	-	-	-	-	P		No	No	0.0	0.0	0.0	No	stream cobble	flake cache?	PRF<45 mm.
37	25-30	D	-	39.0	6.9	-	-	-	-	-	-	I		No	No	1.0	2.0	1.5	No		-	IF<45 mm.
38	25-30	I	35.5R	25.0	7.6	3.5	-	unifacial	-	-	unifacial	S		No	Yes	4.0	4.0	4.0	Yes		-	IFT<45 mm.
39	20-25	I	26.2	24.4	4.2	4.2	Normal	-	-	-	-	I		No	No	5.0	5.0	5.0	No		-	IF<45 mm.
40	20-25	M	-	-	12.1	-	-	unifacial	unifacial	unifacial	-	S		No	No	3.0	0.0	1.5	Yes	Ped Purple like	prismatic like	IFT<45 mm.
63	55-60	I	61.5	66.2	21.5	19.8	5.8	bifaced	bifaced	bifaced	bifaced	S		No	No	0.0	0.0	0.0	No	tabular ledge	-	LFBT>45 mm.
												Total			0%	3%					

I - Entire R - reflaked
D - Distal
M - Medial
P - Proximal

Unifacial	12	14	10	2	38
Beveled	7	6	5	1	19
Utilized	6	4	0	0	10
U-notch	5	3	4	0	12
Bifaced	2	2	1	1	6
Bifacial	0	1	1	3	5

LFBT=Large Flake/Blade Tools
PRF=Primary Reduction Flakes
IF=Interior Flakes
IFT=Interior Flakes Tool

distal end (129-5, 129-7, 129-11, and 129-13), and two lateral edges and the proximal end (129-1 and 129-2). The reflaking was done unifacially from the relatively flat ventral face toward the dorsal face, and it produced coarsely serrated bevels on 10 of the 11 flakes, excepting 129-12. The unifacially flaked edges appear to be dulled, with micro-flakes on the protected concave edges as well as the exposed edges, as if used in some repetitive unidirectional scraping/cutting task.

Description of Non-Cache Artifacts from 41GL129

Aside from the 19 artifacts considered to be part of the flake cache, only 61 other artifacts were recovered. The site artifact distribution (Figure 5) is typical of an open, infrequently occupied campsite in the upper Meusebach Creek watershed. Generally, the collection from 41GL129 contains many more bifaces (n=35) than are represented in the sample of

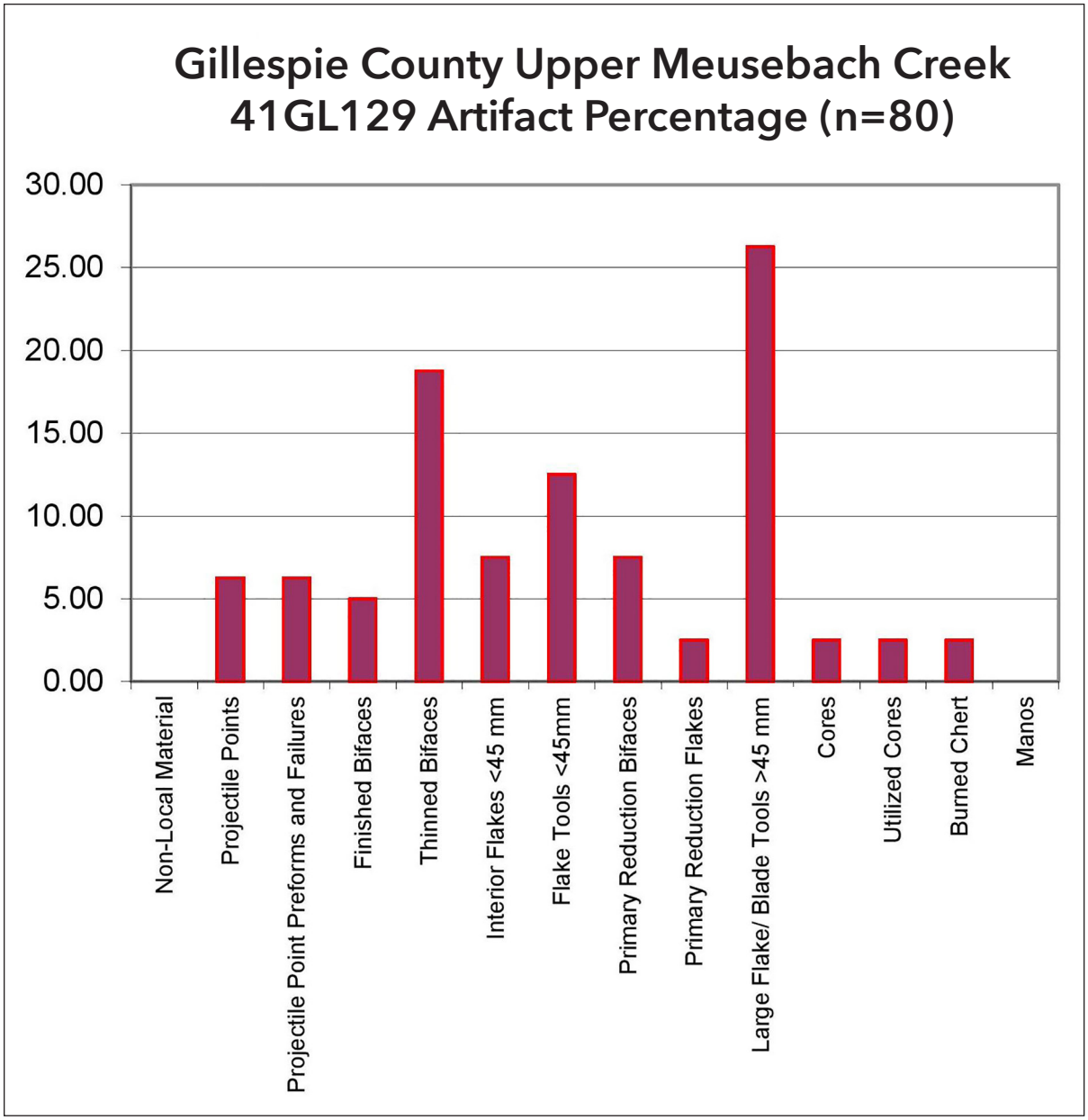

Figure 5. Distribution of artifacts recovered from 41GL129.

20 waste flakes. Few, if any, of the raw materials in either sample matched. Three of the five projectile point fragments show evidence of heating (one Pedernales) and burning (one Pedernales and one possible Paleoindian point distal fragment). The only other materials found at the site that were burned are a potlid flake and a piece of burned chert.

Projectile Points and Fragments (n=5, Figure 6)

129-45 (Figure 6b), Darl-like/narrow Fairland projectile point, is narrow and shallow side-notched like Darl points; however, the base is wider than the shoulders, more like Ensor and Fairland points. The notches are shallow and wide, more like Fairland than Ensor.

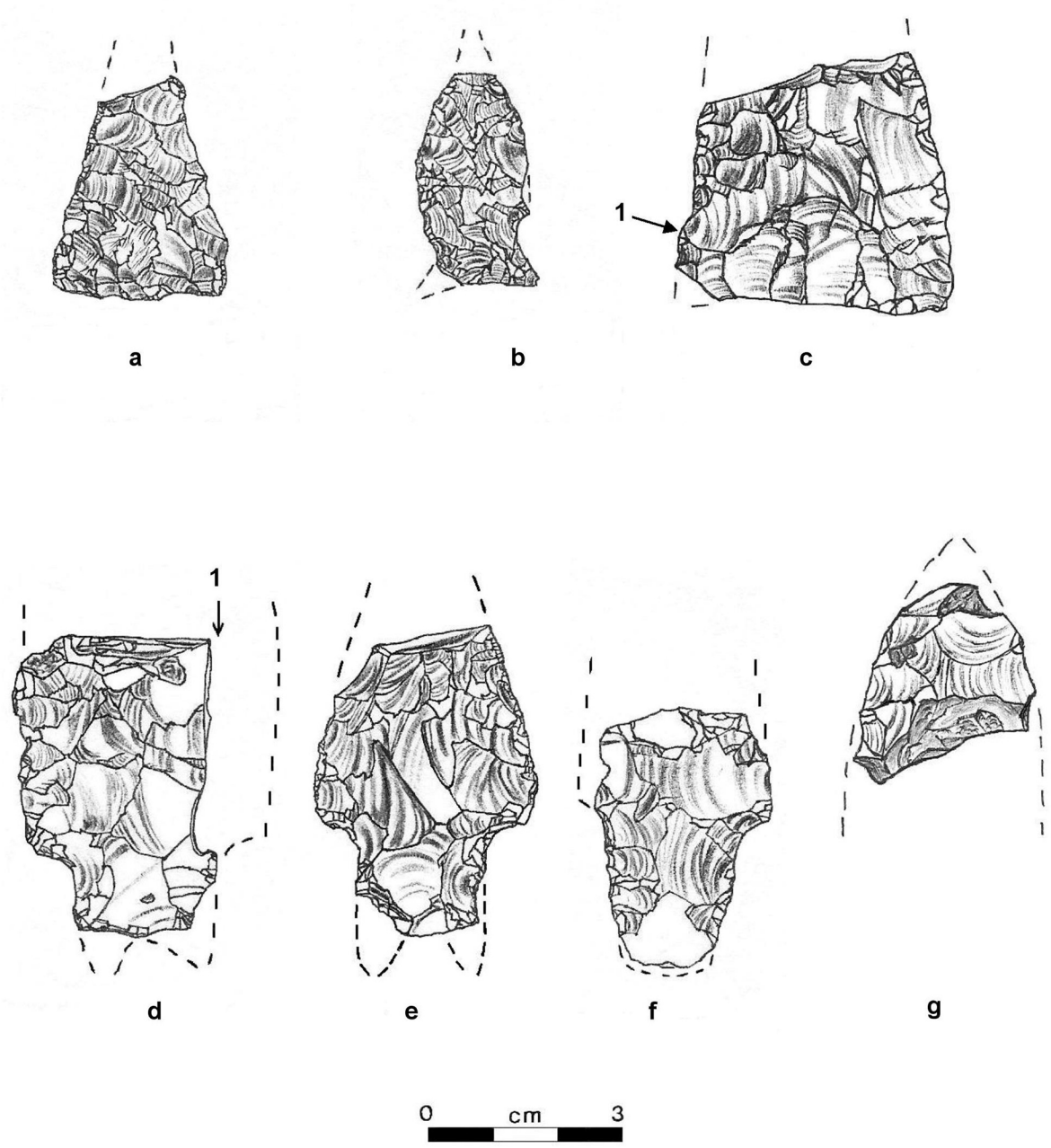

Figure 6. Projectile point fragments and preforms from 41GL129: a, 129-44, arrow point preform; b, 129-45, Darl-like/narrow Fairland; c, 129-46, fragment of finished biface or Frio/Marcos preform (note spur on left edge); d, 129-42, Pedernales with burin from blade snap; e, 129-41, Pedernales; f, 129-43, Wells-like; g, 129-53, Paleoindian point distal fragment.

The base is slightly concave. No bevels, serration, or edge smoothing are present. Damage occurred to the tip (minor tip snap), one lateral edge (subsequently reflaked), and the basal flare (snap). Basal thinning on one face was from a platform at least 5 mm from the base (percussion), and at least 3 mm from the base (pressure) on the other face. Lateral short and long pressure flakes, likely hand and wrist pressure, dominate both blade faces. These flake scars are random and produced after the basal thinning scars. There is no evidence of heating or burning.

Prewitt (1995:100) shows that at least one Darl point has been published for Gillespie County, and the type is a rare occurrence in the area. A point resembling a Darl or narrow Fairland was recovered from 41GL102, and a point resembling a Darl was recovered from 41GL169. Other points similar to 129-45 have been found in Bandera and Edwards counties.

While the 129-41 (see Figure 6e) Pedernales point resembles an unbeveled Nolan point or Bulverde point in its present form, 129- 41 is a Pedernales point that has been reflaked after minor snap damage to the stem. A stem corner snap on one side of the base occurred from a projection at least 10 mm from the snap scar, indicating that the original base was concave rather than convex as it is now. The other half of the basal edge is steep and unifacially flaked, suggesting an attempt at repair. The distal portion was lost by an angular snap with a small impact flute and a subsequent flake that removed the corner of the snap scar juncture with the lateral edge. The stem-blade juncture is the thickest part of the point, and the blade manufacturing scars intrude into the notching and basal stem thinning scars, indicating that final blade thinning was performed after stem formation. Basal thinning preceded notching, and at least three notching scars indicate use of indirect percussion to shape the stem. The raw material is slightly translucent "root beer" chert that had been slightly burned or heated prior to the piece being originally flaked into a point. Prehistoric, as well as modern craftsmen, highly valued this material, and, while it often occurs naturally with potlids, the size and distribution of potlids (relatively large and from the interior rather than highly heated with crazing and small interconnected potlids riddled throughout) suggest that the heating episode may not have been from natural causes. There is no apparent discoloration or luster change.

129-42 (see Figure 6d) is a typical Pedernales point. A transverse snap near the center of the point removed the distal portion of the blade, and another transverse snap also removed at least one of the basal projections. The transverse blade snap was used as a gouge on one face. Subsequent to the transverse blade snap a burin was removed off one of the lateral edges using the snap scar as a platform. The stem is thicker than the blade, and the flake scar sequencing indicates that the final blade thinning was done after stem formation, as they intrude into basal thinning and notching scars. Basal thinning preceded notching, and at least two of the remnant notching scars appear to have been made by indirect percussion. After it was discarded, the point was severely burned.

129-43 (see Figure 6f) is a Wells-like point. The classification of 129-43 as a Wells point is based on morphological similarity, not necessarily cultural affiliation. While relatively common in the eastern part of Central Texas (Bell, Coryell, and Williamson counties) into central East Texas, Wells points are uncommon in the survey area. Prewitt (1995:135) shows that at least one Wells has been reported for Gillespie County. I have seen a few points resembling Wells above the Balcones Escarpment. These tend to be larger, thinner, and less apt to have bifacially serrated edges, less pressure flaking, and little, if any, stem edge smoothing. Most have been found at surface sites and in burned rock midden sites. 129-43 has a yellow stain in some areas on both faces that is typical of artifacts that have been in a streambed. The basal area was damaged and has minor reflaking after patination. Remaining scars from distal end damage are post-patination and include a transverse snap with subsequent reflaking from the snap scar toward the base. Manufacturing scars are primarily small percussion flakes, forming an irregular median ridge on one face in typical Wells fashion. Limited pressure flaking resembling that commonly found on Wells points is present on one lateral stem edge. There is no evidence of heating or burning.

129-53 (see Figure 6g) is a possible Paleoindian projectile point fragment. This artifact is likely a distal tip from a projectile point-sized biface. It has large pressure flake scars, is lenticular in cross-section, and has the highest degree of patina (solid white). No beveling or serration is present. An angular snap removed a small portion of the tip and at least two small pressure flakes were removed from the snap scar.

It is acknowledged that this is a small fragment and severely burned, but it is the correct dimensions for Clovis, Golondrina/Barber, or perhaps

Scottsbluff point types. Flake scars are more irregular than most Scottsbluff points, not collateral; however, the fragment is from near the distal tip of the biface where collateral flakes are difficult to produce. While the blade cross-section is lenticular, it is more irregular than Scottsbluff blades. While Clovis points vary considerably, 129-53 is most different from Clovis because it has a higher number of large pressure flakes than percussion flakes. However, as also noted in comparison to Scottsbluff points, the fragment is from near the distal tip of the biface where final large pressure flakes may be variable, particularly on resharpened points.

Projectile Point Preforms and Failures (n=5, Table 2)

These are basically projectile point-sized bifaces with unfinished edges. Some may show final stages of manufacture, particularly in shaping of the stem area, that indicate the sequence, if not the intended shape and sometimes type, of the point. Attributes include a relatively low maximum thickness, smaller width and length than thinned bifaces, and edges that often retain platform remnants. Of the five preforms, four represent nearly finished performs, while the fifth, 129-25, is a flake preform in the early stages of projectile point manufacture as judged by the original flake size, edge trimming, and basal thinning. None show any evidence of stem or barb formation; however, two are mid-section fragments and one is a distal fragment. 129-44 (see Figure 6a) is the smallest biface, weighing 4.6 grams. It is approximately two-thirds the length and four-fifths the surface area of the preform prior to breakage, and it is very likely an arrow point preform, perhaps of the Edwards type, as it has a very wide triangular base. Except for the basal area, the faces are covered with oblique pressure flake scars oriented in an upper left to lower right direction.

Finished Bifaces (n=4, see Table 2)

Attributes of artifacts classified as finished bifaces include uniform edge alignment, smaller and more numerous flake scars, high width to thickness ratio (generally about 5:1), and they are thinner than most other biface forms. At 41GL129, the mean size overlaps somewhat with the range of projectile points for size. Overall, this category of artifacts is likely to be broken or recycled (reflaked after breakage) because they are generally large and thin. Therefore, the remaining examples are commonly small fragments as compared to original size. This is especially true in open, eroding sites, where they have been exposed to breakage by natural and anthropogenic factors (primarily collecting and reuse). Of the four finished bifaces from 41GL129, three are proximal fragments, and one is a lateral edge of a mid-section fragment that was just above the base of the whole piece.

129-46 (see Figure 6c) is a possible Late Archaic large pressure flaking tradition biface. This artifact has a triangular shape with a slightly concave base. It appears to have been slightly asymmetrical in its whole form. Large pressure flakes were used to do the final basal thinning, and they were also removed unifacially from left blade edges, with a few removed from one right blade edge. On one blade edge there is a spur (see Figure 6c-1) where the large pressure flakes stopped just above the base. A similar feature is the shoulder formed at the shoulders of blades of resharpened Calf Creek horizon points (Weber 2002:45-46). Overall, the blade resembles that of a corner-tanged biface without a tang. Alternatively, the biface may be a late stage Frio-Marcos preform lacking only notches and final edge trimming. There is no evidence of heating or burning.

The 129-47 artifact is narrow relative to its length, with generally parallel edges and a slightly convex base. The lateral and basal edge alignment is excellent, and produced not only by a combination of precise platforms and small percussion flake removals, but also by delicate removal of microflakes to remove percussion platform remnants. No reflaking or dulling is apparent. There is no evidence of heating or burning.

129-50 is a short proximal fragment broken from the original blade by an angular snap. Short pressure reflaking (likely hand and wrist) has occurred from the lateral edges along and toward the center of the snap scar, resembling the proximal fragment of a drill or perforator, but this likely represents an attempt to create a projectile point from a biface fragment. If the former interpretation was correct, the snap scar would be the most recent scar. Instead, short pressure reflaking scars intrude into the snap scar and progress from the edges of the biface toward the center. The pressure flaking was insufficient to reflake and thin the snap scar face/edge, so the attempt was abandoned. The raw material appears to be the same that 129-45, a Darl-like/narrow Fairland point, is manufactured from, and it may be a fragment of a larger biface

Table 2. 41GL129 Biface Attributes (N=35).

Spec No.	Type	Fragment	Mx Length Est. Total	Mx Width	Mx Thick	W:T Ratio	Base Width	Base Align (+)	Base Align (-)	Mean Stem Width	Stem Length	Cortex/ Flake Surface	Burned	Pitted	PATINA FACE 1	PATINA FACE 2	Mean Patina	Patina Reflaked
Projectile Points (n=5)												n=0	n=4	n=0	n=4	n=4	n=4	n=1
53	Paleoindian	distal frag	-	29.5	7.4	4.0	-	-	-	-	-	N	Y	N	5.0	5.0	5.0	N
43	Wells-like	3B1	84.5	27.6	7.2	3.8	11.6	2.3	-	-	22.5	N	N	N	4.0	4.0	4.0	Y
42	Pedernales	2B2	125.0	42.0	7.9	5.3	18.6	-	-5.5	22.4	18.6	N	Y	N	2.0	4.0	3.0	N
41	Pedernales	2A2	72.5	35.2	9.6	3.7	20.0	-	-	20.4	-	N	Y*	N	1.0	1.0	1.0	N
45	Darl-like/narrow Fairland	2B1	39.0	17.6	5.3	3.3	17.2	-	-1.1	12.6	11.5	N	Y	N	0.0	0.0	0.0	-
	Mean		80.3	30.4	7.5	4.0	16.9	-	-	-	-	0%	80%	0%	80%	80%	80%	25%
Projectile Point Preforms and Failures (n=5)												n=1	n=1	n=0	n=0	n=2	n=2	n=0
25	straight base	proximal frag	-	50.2	8.8	5.7	-	-	-	-	-	1V	N	N	0.0	0.0	0.0	-
44	straight base	proximal frag	55.0	28.4	4.6	6.2	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
48	-	midsection frag	-	-	7.2	-	-	-	-	-	-	N	N	N	0.0	1.0	0.5	N
49	-	midsection frag	-	-	5.9	-	-	-	-	-	-	N	Y	N	0.0	1.0	0.5	N
51	-	distal frag	46.6	36.5	6.7	5.4	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
	Mean		50.8	38.4	6.64	5.8	-	-	-	-	-	20%	20%	0%	0%	40%	40%	0%
Finished Bifaces (n=4)			Total									n=0	n=1	n=0	n=1	n=1	n=1	n=0
46	concave base	proximal frag	102.0	43.5	7.8	5.6	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
47	straight base	proximal frag	-	30.5	6.0	5.1	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
50	straight base	proximal frag	-	33.0	7.5	4.4	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
52	Unidentified	midsection frag	-	-	7.6	-	-	-	-	-	-	N	Y	N	1.0	1.0	1.0	N
	Mean		102.0	35.7	7.2	5.0	-	-	-	-	-	0%	25%	0%	25%	25%	25%	0%
Thinned Bifaces (n=15)												n=2	n=0	n=0	n=5	n=5	n=4	n=0
54	convex base	proximal frag	53.6	52.0	12.9	4.0	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
55	straight base	proximal frag	37.4	32.5	11.5	2.8	-	-	-	-	-	N	N	N	2.0	2.0	2.0	N
56	-	distal frag	42.0	54.8	10.1	5.4	-	-	-	-	-	N	N	N	1.0	2.0	1.5	N
57	straight base	proximal frag	93.5	31.7	12.1	2.6	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
58A	-	distal frag	44.2	51.6	9.7	5.3	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
58B	straight base	proximal frag	39.8	44.8	10.9	4.1	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
59	-	distal frag	40.2	38.4	9.2	4.2	-	-	-	-	-	N	N	N	2.0	2.0	2.0	N
60	-	distal frag	39.0	52.4	11.3	4.6	-	-	-	-	-	2C	N	N	0.0	0.0	0.0	-
61	straight base	proximal frag	76.4	53.1	15.8	3.4	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
62	-	distal frag	73.1	52.7	14.0	3.8	-	-	-	-	-	N	N	N	0.0	0.0	0.0	-
68	straight base	entire	77.0	53.2	15.2	3.5	-	-	-	-	-	Cbase	N	N	0.0	0.0	0.0	N
69	straight base	entire	60.9	43.9	13.8	3.2	-	-	-	-	-	N	N	N	0.0	0.0	0.0	N**
70	straight base	proximal frag	64.7	55.5	14.9	3.7	-	-	-	-	-	-	N	N	0.0	0.0	0.0	-
71	-	midsection frag	-	40.4	16.5	2.4	-	-	-	-	-	-	N	N	0.0	0.0	0.0	-
72	convex base	proximal frag	66.2	45.2	15.5	2.9	-	-	-	-	-	N	N	N	2.0	0.0	1.0	N
	Mean		57.7	46.8	12.9	3.7	-	-	-	-	-	15.40%	0%	0%	33.33%	33.33%	40%	0%
Primary Reduction Bifaces (n=6)												n=6	n=0	n=0	n=2	n=3	n=4	n=0
73	-	distal frag	72.4	38.6	18.9	2.0	-	-	-	-	-	1C; 1 Cedge	N	N	1.0	0.0	0.5	N
74	convex base	entire	76.4	62.5	17.9	3.5	-	-	-	-	-	2C; 1 Cbase	N	N	0.0	1.0	0.5	N
75	convex ends	entire	99.0	64.5	34.4	1.9	-	-	-	-	-	2C; 2 Cedge	N	N	1.0	1.0	1.0	N
76	convex ends	entire	102.5	63.7	31.2	2.0	-	-	-	-	-	2C; 1 Cbase	N	N	0.0	0.0	0.0	N
77	straight ends 1 convex end; 1 straight	entire	86.6	48.0	22.8	2.1	-	-	-	-	-	2C; 1 Cedge	N	N	0.0	1.0	0.5	N
78	end	entire	90.0	63.6	30.4	2.1	-	-	-	-	-	1 subC; 1 Cedge	N	N	0.0	0.0	0.0	-
	Mean		87.8	56.8	25.9	2.3	-	-	-	-	-	100%	0%	0%	33.33%	50%	66.67%	0%

from which 129-45 was subsequently made. There is no evidence of heating or burning.

129-52 is a severely burned piece that retains one lateral edge of a mid-section fragment from just above the base of the original biface. Both faces retain percussion/basal thinning scars in what was once the center of the biface. Blade edge alignment is good and shows micro-flaking. Although discolored from burning, the material resembles that of 129-45 and 129-50.

Thinned Bifaces (n=15, see Table 2)

Thinned bifaces are defined by a large size, relatively high width to thickness ratio (generally 3:1 or higher), and relative lack of cortex. They commonly retain unfinished edges that exhibit platform remnants and lack of final edge alignment flake scars. Also included in this category are bifaces that could also be considered primary reduction bifaces because, while they exhibit a relatively high width to thickness ratio, they were made from thin tabular cores and may retain some cortex on edges and/or one or both faces. However, it is clear that holding, stabilization, platform preparation, and flake removal on thinner cores is much different and more difficult than with thicker cores, so I view the selection of thin, tabular cores as basically an efficient short cut to a thinned biface.

Since most large thinned bifaces are fragments, I estimated the mean total original length (prior to breakage) for the thinned bifaces by doubling the mean of the sum of the length of proximal and distal fragments. This yielded a mean size of thinned bifaces of 120 x 47 x 13 mm (3.7:1 width to thickness) at 41GL129, which is well within the size range of thinned bifaces needed to manufacture projectile points. Their shapes range from symmetrical to irregular, and from bi-pointed to having obvious acute (distal?) and less acute (proximal?) ends. Of the nine with apparent bases, seven appear to be proximal fragments and two are essentially whole. Seven (78 percent) of the nine have straight bases, and the remaining two have convex bases. None of the biface fragments could be refitted, and none of the thinning flakes found at the site appeared to have been removed during reduction of the thinned bifaces, as could be determined from size, material color, and texture. None of the bifaces have evidence of heating or burning.

Primary Reduction Bifaces (n=6, see Table 2)

Primary reduction bifaces are defined by a low width to thickness ratio, usually less than 3:1 and averaging near 2:1, the presence of large areas of cortex on one or both faces and/or edges, and a relatively low number of flake scars usually confined to edging and cortex removal. The mean size of primary reduction bifaces at 41GL129 is 87.8 x 56.8 x 25.9 mm (2.2:1 width to thickness), roughly the size and shape of a medium-sized potato. These bifaces are made from upland cobbles found in the vicinity as observed from raw material color, texture, and cortex. Three of the six, 129-74, 129-76, and 129-77, were likely discarded due to poor raw material quality (hard, coarse ledge chert from nearby hills), while the remaining three are of high quality raw material (see Table 2). It should be noted that in general the six bifaces are smaller than the thinned bifaces at this site, and two of them on excellent material that could easily have been reduced to make fine projectile points. None have any evidence of heating or burning.

Cores and Utilized Cores (n=4, Table 3)

129-64-129-67 are small, medium potato-sized cores of local raw material. They range in weight from 94.7-164.1 g, and average 71.3 x 44.1 x 34.5 mm in size. Two have battered edges, indicating use as hammerstones, while the other two show no damage subsequent to final flake removal. None of the cores could have produced any of the flakes in the flake cache. None are patinated and none show any evidence of heating or burning.

129-64, one of two battered cores, is a classic Late Prehistoric (ca. A.D. 750- 1690) conical platform core (Collins 1995:384-386), although the platform end is triangular rather than circular in shape due to flake removals. Looking down at the platform end, it is triangular due to late flake removals, and it is severely battered on one of the edges, indicating its use as a hammerstone. The opposite distal end is the acute convergence of ridges from flake removals.

129-65 is a small more-or-less triangular and bifacial core. The three bifacial edges are severely battered, indicating that it was also used as a hammerstone. These cores have lightly stream-rolled cortex similar to cache flakes, indicating that the

Table 3. 41GL129 Core Attributes.

Cores (n=4)	Type	Fragment	Utilized	Mx. Length	Mx. Width	Mx. Thick	Weight	Cortex	Burned	Pitted	Mean Patina
64	conical platform	entire	Battered	57.7	40.4	38.5	94.7	No	No	No	0.0
65	bifacial	entire	Battered	63.7	50.4	26.0	117.2	1 edge	No	No	0.0
66	tabular platform	entire	No	76.0	44.7	37.8	164.1	No	No	No	0.0
67	prismatic platform	entire	No	87.6	40.7	35.5	130.5	2 faces/ 1 end	No	No	0.0
	Mean			71.3	44.1	34.5	126.6				0.0

parent rock was obtained from a gravel deposit. The material is similar to that of Cache Flakes 3 and 5.

129-66 is a small piece of tabular ledge chert that was flaked on three sides from the top as a platform core. The number of successful flake removals from this core was very small.

129-67 is the mid-section of a ledge nodule that is triangular in cross-section and flaked on all three faces from the edges. Only large flake scars are present on the three faces. Their small size and the size of flake scars suggest a Late Prehistoric affiliation.

Thinning Flakes and Thinning Flake Tools (n=14, see Table 1)

Individual flake data is shown in Table 1 and Figure 7 depicts the flake size distribution. The number of flakes in the sample is very small. A larger sample could not be obtained at the time of collection because of their scarcity on the ground surface.

Most are in medium to large size ranges (20 x 20 to 40 x 40 mm). Compared to the biface manufacturing curve, there is a paucity of flakes in the 10 x 10 to 27.5 x 27.5 mm range, suggesting a sampling error (not visible or not collected) or removal of small size flakes from the site by erosion. A combination of the two is most likely. The portion of the 41GL129 flake size distribution curve from 27.5 x 27.5 mm to 45 x 45 mm matches the lower end of the biface curve, suggesting that biface manufacture was an activity performed at the site, although minimally, considering the small number of thinned bifaces found.

Of the 14 flakes, eight of them were made of raw materials available in the immediate vicinity (likely nearby uplands, although the exact source

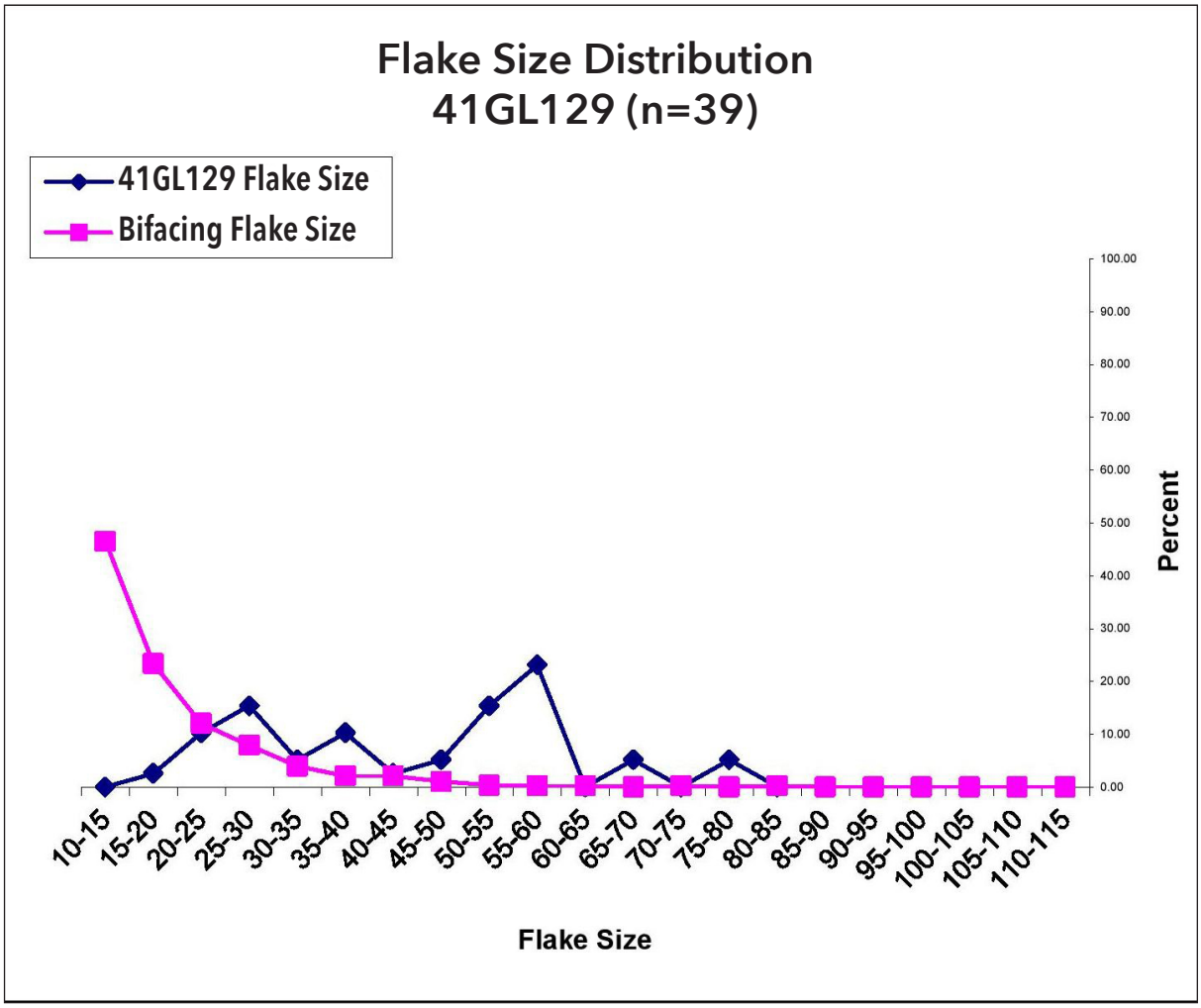

Figure 7. 41GL129 flake size distribution as compared to bifacing flake size distribution. Peaks greater than 45 mm squared represent flake cache and two large primary reduction flakes/flake tools.

is not certain), while the raw material sources of the remaining six are uncertain. Four of the flakes from the immediate vicinity are interior flakes, and the remaining four have cortex that has not been subjected to stream rolling. Flakes 129-22 and 129-63 appear to be of the same or a similar raw material as primary reduction biface 129-74 as determined by color and texture. The remainder of the flakes do not appear to have been removed from or made of the same raw material as any of the bifaces found at the site.

Ten of the 14 (71 percent) thinning flakes were recycled as tools, exhibiting various forms of reflaking and utilization, only two of which, 129-38 and 129-40, are post patina (see Table 1). When oriented with the ventral face up and the platform toward the observer, 10 of the 14 flakes (71 percent) exhibit left edge modification, eight (57 percent) exhibit right edge modification, five (35.7 percent) exhibit distal edge modification, and two (14.3 percent) have proximal edge modification. For potential use as projectile points/performs, eight of them could have produced small Archaic dart points, and four could have produced arrow points.

Quarrying and Primary Reduction Flakes and Flake Tools < 45 square mm (n=4, see Table 1)

129-26, 129-28, and 129-36 have stream-abraded cortex surfaces, and of those 129-26 and 129-36 have patinated remnant fracture surfaces (one platform, one dorsal) indicating reuse of flakes produced by earlier occupations. 129-28 was very likely quarried from the nearby Meusebach Creek streambed, as it has no yellow staining and only very light cortex abrasion from stream rolling. 129-36 has been subjected to considerable stream rolling and is stained throughout with a yellowish tint. It resembles some of the material present in the flake cache, and it may be a fragment of a flake that was originally part of the cache collection. 129-21 is of local ledge material, and it has been unifacially reflaked/beveled toward the dorsal face to produce four notches that are 10.5-14.0 mm in width or exposed gravers 2.0-14.2 mm in width. None have evidence of heating or burning.

Non-local Materials

Manuports, such as rose quartz, stream-rounded quartzite, hematite, quartz crystal, and metamorphic and igneous rocks from the Llano-Burnet uplift area that are occasionally found on some other sites in limestone areas of Gillespie County (Weber 2012:101-110) were not found on 41GL129. Non-local materials are considered to be materials not easily obtained within the Pedernales River watershed, and in particular within the Meusebach Creek watershed. Such materials would be acquired by foraging over a wider range, specialized procurement forays, or trade. The materials at 41GL129 that are likely from more distant sources were used to make bifaces, including the chert from which 129-45 (Darl-like/narrow Fairland), 129-50 (finished biface fragment), and 129-52 (finished biface fragment) were made, that may have come from gravel bars in the upper Llano River watershed. They were tabulated in artifact categories other than "Non-local Materials" in Figure 5. Dark brown, or "root beer," material resembling Knife River flint, from which 129-41 (Pedernales), 129-48 (projectile point preform/failure), and 129-69 (thinned biface) were made, most likely came from outcrops near Harper, Texas, within the Pedernales River basin; however, this material is also known in the upper Guadalupe and Llano river basins.

Occupation of 41GL129

A temporary campsite, 41GL129 may be described as a non-residential, short-term resource procurement site. Although an intensive surface collection was performed, only 80 artifacts were recovered. Given the thin, eroded soil, this suggests that 41GL129 served as a rarely occupied temporary campsite by a small number of individuals, representing perhaps as few as six events that resulted in deposition of a likely Paleoindian projectile point fragment, a Wells-like point, two Pedernales points, the flake cache, a Late Archaic finished biface or Marcos preform, a Darl-like/narrow Fairland point, and an arrow point preform, which span the entire range of Texas prehistory. In reality, there were likely more camping events that resulted in the entire collection, some of which left little or no archeological evidence.

Considering the small sample, the artifacts represent an assortment of raw materials from the local area with the exception of the flake cache, the Darl-like/narrow Fairland point, and finished biface fragments 129-50 and 129-55. No biface fragments could be refitted, and, excepting one interior flake (129-23) and one core (129-65), none of the

flake raw materials could be definitely matched to biface or core raw materials, indicating that almost all of the cores, flakes, thinned bifaces, preforms, spent projectiles, and replacement projectile points were reduced elsewhere and brought to the site.

Subject to erosion and surface collection, later people may have removed artifacts, particularly raw materials that could have been reused or diagnostic artifacts sought by collectors, that may have been present at one time. 41GL129 was likely visited during forays for procurement of raw materials, hunting, or a combination of both. The variety of raw materials in the small artifact sample indicates a foraging range that included the central and western reaches of the Pedernales River watershed, if not the upper Llano River watershed in the Junction, Texas, area.

Activities by prehistoric people that are indicated by the artifacts recovered at 41GL129 are:

- Transportation of lithic raw materials in reduced form (cores, bifaces) to the site;
- Limited quarrying at nearby locations (at least two flakes of local materials in the cache and three primary reduction flakes, 17 waste flakes, 10 bifaces, and four cores);
- Limited (casual) flaking of bifaces or transportation of waste flakes and biface fragments (18 waste flakes, 15 thinned biface fragments);
- Flaking of arrow points (129-44, see Figure 6e, broken arrow point preform);
- Flaking of small cores to produce flakes less than 45 square mm in size (two small, unbattered cores);
- Use of small cores as hammerstones (two battered);
- Refitting of projectiles with unbroken points or loss of points in carcasses left at the site (five abandoned projectile point fragments);
- Use of waste flakes to perform scraping and cutting tasks (13 of 18 show edge modification, possibly shaft/foreshaft manufacturing);
- Possible use and abandonment (too much to carry, storage for future) of a tool kit of 19 large flakes/flake tools;
- Possible making of fire (one potlid flake, one piece of burned chert, one burned Pedernales point, one burned possible Paleoindian point distal tip, and one burned finished biface fragment); and
- Range and/or trade over a larger area that may include the upper Llano River basin (one projectile point and two finished biface fragments from possible upper Llano basin chert).

With the exception of the cache, these activities are expected, and evidence of them is commonly found on sites. Flaking of arrow points, flaking of small cores to produce small flakes, and the production and use of conical platform cores as hammerstones are activities specifically associated with a Late Prehistoric occupation of the site.

The Relevance of Low Waste Flake Numbers

While the number of bifaces from 41GL129 is small, it is very high relative to the very small amount of reduction waste found at the site. 41GL129 yielded a relatively high number of bifaces as compared to reduction waste. Assuming that the samples of bifaces and reduction flakes are not greatly biased by collecting and erosion, they indicate that most quarrying, primary reduction, and thinning of bifaces was apparently performed elsewhere. Moreover, 10 of 14 thinning flakes (71 percent) and three of four primary reduction flakes have been reflaked in ways that indicate their use as tools or intended tools. This indicates that the overall number of waste flakes at the site was never very high.

I have broken tons of mixed tabs, nodules, and cobbles to produce primary reduction bifaces and large thinned bifaces with no specific target for the finished biface other than a width to thickness ratio of at least 4:1. The process invariably results in a proportion of acceptable primary reduction bifaces, thinned bifaces, and byproduct flakes from which dart points could be made (excluding those from which small flake tools and arrow points could be made) that are approximately 33 percent of the total mass volume. The rejected pieces and waste from the reduction process constitute the remaining 67 percent of the total volume. If a substantial amount of this work had been performed at 41GL129, waste flakes would be a much larger part of the artifact inventory. The primary reduction and thinned bifaces found at 41GL129 were made elsewhere and brought to the site, and they were

likely lost and rejected pieces that were part of a larger load being transported from lithic procurement areas to a larger camp.

I successfully replicated the flake size distribution results previously presented by Patterson (1982b:70-72) using two different samples. A random, composite, sample of waste flakes (n=964) was taken from one of my debris piles that was deposited during many episodes of reducing cores to large thinned bifaces using a variety of tools. Another sample was carefully collected from a controlled experiment that I performed using a hammerstone to manufacture a single Nolan point, which produced 148 waste flakes. The flake size distribution curves from both of these experiments are essentially identical to each other (Figure 7 shows the combined curve), as well as the one presented by Patterson (1982b:70-72) for reduction of bifaces. The distribution shows that there are vastly higher numbers of small flakes than medium and large flakes, numbers that are hundreds and thousands of times greater than those that would be produced by any other technique. They result from shatter, as well as trimming to create flaking platforms. Patterson (1978:103-112, 1990:550-558) noted that small flakes are rarely recovered in archeological contexts and that they are virtually identical regardless of the technique used to produce them.

The very small waste flake sample from 41GL129 is shown in both the Figure 5 artifact distribution and the Figure 7 flake size distribution. While the flake cache has a distribution typical of flake production from cores (Patterson 1981, 1990), the remaining flake sample has a distribution curve typical in biface manufacture, albeit noticeably missing flakes in the small size range, that is likely a combination of sampling error and removal of the smaller size flakes and fragments by erosion. Thus, even though the very low number of waste flakes at the site cannot account for all of the bifaces deposited there, their size distribution suggests that some biface thinning/trimming, however minimal, was performed at the site.

Manufacture, Use, and Deposition of the Flake Cache

Blum and Valastro (1989:435) describe the Pedernales River as a bed load-dominated stream. The large gravels were deposited from steep gradient high energy flows from tributaries during the Early and Late Holocene. Because of the relatively low stream gradient between its headwaters and the middle of the river, the Pedernales could not move the gravel deposits down to its mouth, but instead modified them into the form of more or less static gravel bars with chute channels that could accommodate lower energy discharges. As a result, some varieties of chert appear more or less frequently depending on where a particular gravel deposit is located relative to the length of the river; i.e., chert varieties tend to be most common and largest nearest the confluence of the tributary that transported them to the river. Thus, it is possible in some cases to estimate where a particular variety of chert originated. The farthest location of chert represented in the flake cache is the vicinity of Tivydale, Texas, approximately 22.4 stream miles from 41GL129.

The Pedernales River from its confluence with Meusebach Creek upstream to Tivydale, Texas, is the nearest source that has all of the non-local raw materials from which the cache flakes are made for the materials not found in the Meusebach Creek drainage. The main stem of the Pedernales River from the Meusebach Creek confluence to western Gillespie County should have been well within the habitual range of people living in the area. Given the infrequent use of 41GL129, I doubt that any of the cache flakes represent items acquired by trade, but were more likely part of a working tool kit transported by their owner(s).

The cache flakes comprise a disproportionately high percentage of artifacts compared to other classes of artifacts at 41GL129. Except for one flake fragment that may have been brought with the cache, cores or waste flakes that could have been produced by manufacture of the cache flakes are absent. In addition to the identified raw materials from which the cache flakes were made, this indicates that most of the cache flakes were manufactured elsewhere and subsequently transported to the site as a group.

The relatively consistent shape and size of the flakes, particularly 129-1-129-12 and 129-14, indicate well-planned and well-executed core and platform preparation and flake removal. 129-1-129-12 appear to have been made by "peeling" nodular cores, as evidenced by presence of cortex on faces and lateral edges, rather than at distal and proximal edges. There are more secondary than primary or interior flakes. During the reduction of a single core, regardless of form, the number of primary flakes is generally low. In biface and blade production, where high numbers of flakes are removed from the same core, the number of

interior flakes is generally high. When producing large flakes from a single core, each flake removal decreases core mass, so it becomes progressively more difficult to remove flakes of the desired size range. In other words, because each flake removal reduces core size, there is a point at which flakes of a certain size range can no longer be produced. This is not only because the core mass is reduced, but also because the smaller core is more difficult to stabilize. Decreasing core size may partially explain the relatively high number of secondary flakes as compared to interior flakes. Remnant cores from large cobbles tend to be relatively large and heavy, and they were likely to be left where the flakes were produced rather than transported. There they are apt to be washed downstream, if left in stream bottoms, or further reflaked later by other individuals.

Tunnell (1978:26) interpreted the Gibson cache flakes to be trimmed blanks intended for biface manufacture. Tunnell also noted that a hammerstone could be used to produce the edge trimming flakes, micro-flakes, and dulling found on the Gibson cache flakes. I performed several experiments to replicate the edge flaking. A hammerstone easily produces flake scars and coarse serrations resembling those found on 129-1-129-11; however, the edges that I produced were thin, sharp, and fragile. Using a hammerstone to produce dulling and micro-flakes such as those found on the edges of 129-1-129-11 removed the coarse serrations. The somewhat dulled edges and microflake scars, particularly those removed inside the negative flake scars, on 11 of 19 flakes appear to show use for various cutting and scraping tasks. Furthermore, the further away the raw material of each flake is from its apparent source, the more edge reflaking is shown, suggesting that they were employed in some task along the journey. These observations indicate that that the dulling and micro-flakes on the edges of 129-1-129-11 were not produced by the hammerstone that was used to manufacture the coarsely serrated bevels, but rather by cutting and unifacial scraping tasks. Some of the flakes showed minor unifacial, bifacial, and utilization flakes, as well as notches and gravers. No attempts were made to thin any of the flakes, as if to make bifaces. The way they were manufactured and then used rendered them difficult to convert to thinned bifaces, suggesting that they were intentionally manufactured for use as flake knives or side scrapers (see Turner et al. 2011:246-247).

Since the cache from 41GL129 was found on the surface of an open, eroding surface, the structure and possibly the content of the cache may have been altered since its deposition. The original owners may have abandoned the flake cache on the surface of the site, whereupon it was scattered by subsequent animal or human activity, and weather events. It may have been left intentionally as a result of deliberate abandonment (i.e., too much to carry, or of low value). The flakes may have been associated with an activity performed on the site, or they may have been simply discarded. It is also possible that the owners buried the cache in a shallow pit later exposed by erosion, and then scattered. The latter interpretation is subject to the actual age of the cache and the rate of erosion in the Meusebach stream valley. While no study specific to the Meusebach drainage was found, Collins (1995:376-377) identified major erosional episodes that occurred in the Pedernales River basin prior to 10,500 B.P. (Folsom), between 7000 and 4000 B.P. (Martindale-Uvalde, Andice-Bell-Calf Creek, Taylor, and Nolan-Travis), and after 1000 B.P. (Scallorn-Edwards). However, as these episodes of erosion in the Pedernales River floodplain coincided with dry periods, major downcutting of the upper Meusebach, which is high in the Pedernales watershed, coincided with periods of heavy deposition in the Pedernales floodplain in the Late Holocene (ca. 4500-1000 B.P.), during which the large gravels were deposited (Blum and Valastro 1989:447).

The raw material indicates that at least 11 parent cores were used to produce the cache flakes. Based on the known size and shape of similar raw materials, each of the cores could have produced many more flakes than are represented by the flake cache. This indicates missing flakes; this was noted by Tunnell (1978:51) for the Gibson cache as well. Missing flakes suggests that other pieces of the original collection may have been discarded prior to abandoning the cache, as well as carried away after caching. While it is possible that the flakes were deliberately cached for future use, it is also possible that the cache represents pieces that were discarded from a tool kit that was being transported, rather than being stored for later use. If so, it may be appropriately described as an example of Schlanger's "load-exchange" cache as described by Miller (2007:9), produced by exchanging tools used to procure resources with the resources procured, or Schiffer's "abandonment cache" (Miller 2007:11), which are useable tools left behind

when an area is abandoned and to which return is expected or likely.

Tunnell (1978:50-51) suggests that the age of the Gibson cache is Archaic, based on comparison of the size, shape, and manufacturing technique with Paleoindian and Late Prehistoric caches. If these attributes can be used to establish comparative age, flakes in the 41GL129 cache appear to be approximately the same age as those in the Gibson cache. None of the flakes in the 41GL129 cache have any patina. Compared to the mean patination of diagnostics in the survey area, all of which were deposited on similar soils and in similar erosional conditions, the 41GL129 cache flakes appear to date no earlier than Williams, Castroville, and Montell points, and they are possibly later.

Blum and Valastro (1989:435-456) show the river gravel raw material from which most of the flakes are made was deposited no more recently than the Late Holocene (ca. 4500-1000 B.P.), dated in Pedernales River deposits near Fredericksburg not far from the Meusebach Creek confluence. This period of time comprises the Late Archaic period in Central Texas prehistory (Collins 1995:376, 384).

Based on the above, activities by Late Archaic people indicated by the flake cache found at 41GL129 are: (a) travel generally down the main stem of the Pedernales River to the Meusebach Creek confluence, then upstream along Meusebach Creek toward its upper watershed; (b) production of large flakes of consistent size and shape from large gravel cobbles obtained along the travel route with hammerstones; (c) reflaking of some of the sharp flakes with a hammerstone to produce coarsely serrated, unifacially beveled edges; (d) use of unifacially beveled flakes along the travel route that produced micro-flakes and dulling on the edges both within concavities and along projections; (e) use of sharp-edged flakes in the kit for cutting and scraping tasks; and (f) abandonment of the flakes at 41GL129.

Comparison of the 41GL129 Flake Cache to Referenced Flake Caches

Figure 8 shows the flake size distribution for the 41GL129, Gibson, and Alibates caches, and Table 4 illustrates the mean quantitative data for all four caches. Generally, the 41GL129 cache has more in common with the Gibson cache than with the Alibates and Brookeen Creek caches. Comparing the caches based on size and edge treatment, the Alibates and Brookeen Creek caches appear to be Late Prehistoric (A.D. 750-1690, Collins 1995:384-385) and smaller, less likely to be trimmed and/or used as small tools, while the 41GL129 and Gibson caches appear to be Archaic (9000-1200 B.P., Collins 1995:383-385) and larger, more likely to be trimmed and/or used as tools.

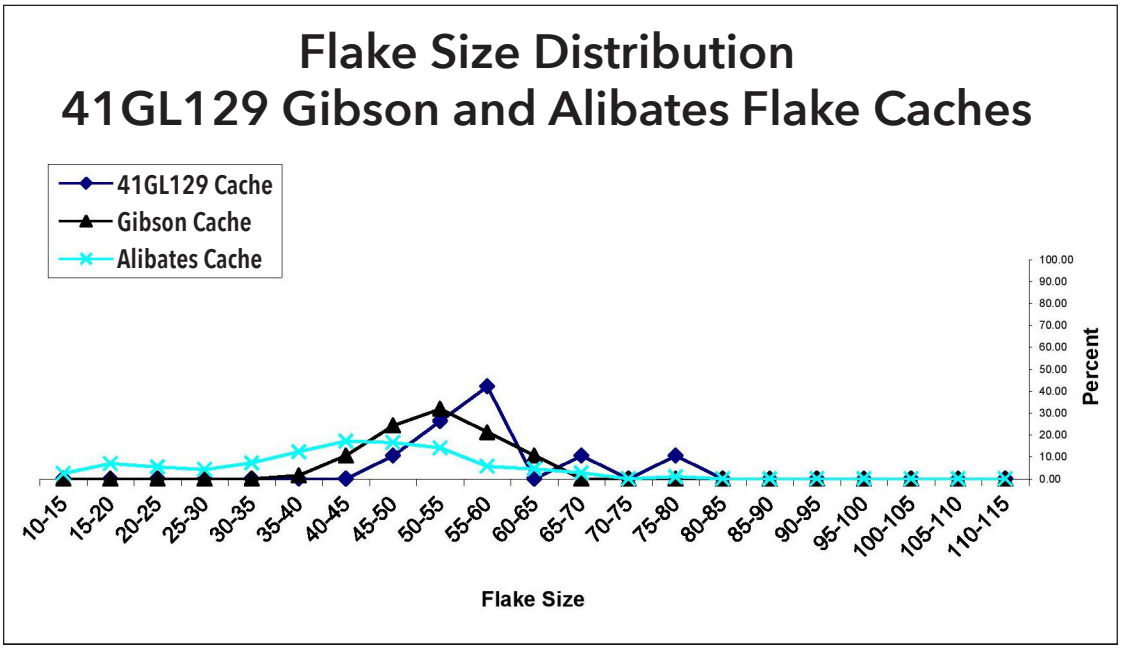

Figure 8. Flake size distribution of 41GL129, Gibson, and Alibates flake caches.

Table 4. Comparison of Mean Flake Size for 41GL129, Gibson, Brookeen Creek, and Alibates Caches.

Cache	Statistic	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Platform Width (mm)	Platform Thickness (mm)
41 GL 129	Mean	88.5	48.9	15.6	71.3	17.4	8.7
n=19	Max	132.0	67.2	26.3	232.9	30.3	15.8
wt.=1354.7g	Min	68.5	33.2	8.9	25.3	9.1	4.1
	Std Deviation	18.4	10.4	4.0	45.1	5.4	2.9
Gibson	Mean	85.5	41.2	13.8	51.2	13.1	5.5
n=72	Max	118.3	52.2	19.2	92.9	21.8	10.5
wt.=4228.4g	Min	55.2	26.4	6.1	25.5	4.1	1.8
	Std Deviation	14.9	4.6	2.6	16.0	4.7	2.2
Brookeen Creek	Mean	69.3	35.2	8.2	*15.43	-	-
n=173							
wt.=2669.39g							
Alibates	Mean	53.9	43.0	6.6	-	-	-
n=331	Max	131.0	85.8	14.0	198.3	-	-
wt.=5163.6g	Min	11.4	9.2	1.4	0.3	-	-
	Std Deviation	18.8	15.0	2.8	15.5	-	-

*includes fragments

The Alibates cache site is 1.5 miles from the quarry where the flakes were apparently obtained. Generally, the Alibates cache flakes are smaller than the 41GL129 flakes (see Table 4). Most were apparently produced from bifacial cores, and their edges are largely unmodified. The Alibates cache was found buried in a pit associated with other types of non-lithic artifacts and a Fresno arrow point at a substantial Late Prehistoric Panhandle Aspect village occupation site. While diagnostic artifacts representing various and distantly separated periods of Texas prehistory were found at 41GL129, none were directly associated with the flake cache, even though it was collected from a relatively large area (9 square meters) as compared to the other caches.

The Edwards chert from which the Brookeen Creek cache flakes were made was not identified by specific source; however, the Brookeen Creek site is located well within the Blackland Prairie eco-region, perhaps 50 or more miles from the quarry location. Consisting solely of a clearly buried flake cache, the Brookeen Creek cache site was neither a quarry site nor an occupation site. The 41GL129 flake cache was not clearly buried like the Brookeen Creek Cache. Instead, it was recovered from the surface of an eroding temporary campsite. As shown in Table 4, the mean size of the 41GL129 cache flakes is much larger than the Brookeen Creek cache flakes, whereas the flakes in the Brookeen Creek cache are closer in size to the Alibates cache flakes. Like the Alibates cache flakes, the Brookeen Creek cache flakes appear to be unused with largely unmodified edges. If flake size can be used for comparative dating as Tunnell (1978:50-51) suggests, the Brookeen Creek cache would be closer in age to the Alibates cache, while the 41GL129 cache would be closer in age to the Gibson cache. Also, the location of the Brookeen Creek cache near the surface in a floodplain next to a creek channel in the Blackland Prairie suggests a Late Prehistoric affiliation.

Both the Gibson and 41GL129 caches were found within areas where Edwards chert outcrops. While the Gibson Cache was found at the site from which it was quarried, the 41GL129 cache appears to have been accumulated along a route down the Pedernales River from at least as far as Tivydale, Texas, and then upstream along Meusebach Creek. The Gibson cache was recovered from a defined basin-shaped depression, while depositional circumstances of the 41GL129 cache are unclear.

With the exception of 129-13 and 129-15, the flakes from 41GL129 closely resemble the 72 flakes described by Tunnell (1978) from the Gibson cache, although the number from 41GL129 (n=19) is significantly lower, and the 41GL129 flakes are slightly larger (see Table 4). The long sections and cross-sections of the 41GL129 flakes are like those from the Gibson Cache. Flakes 129-1-129-11 from 41GL129 appear to fit Tunnell's (1978:26) description of trimmed flakes for the Gibson cache. Tunnell (1978:26) suggests that "trimming" and dulling on the Gibson cache flakes were done by a hammerstone, that the flakes were made and cached that way, and they were never used. The flakes from 41GL129 cache appear to show either coarse serrations with edge micro-flakes and dulling around projections and between projections within concavities, or relatively sharp, unmodified edges. Most flakes from the Gibson cache appear to have relatively even edges.

While the meaning of some attribute data tabulated for the Gibson cache flakes is unclear, like data was tabulated from the 41GL129 cache flakes for comparison. The Gibson cache flakes showed more curvature (24 percent prominent, 56 percent moderate, and 20 percent slight) than the 41GL129 cache flakes (11 percent moderate, and 89 percent slight). For lateral removal angle, 41GL129 has a wider range (160-205 degrees) than the Gibson cache (160-195 degrees), and it has an equal percentage of left and right flakes while the Gibson cache flakes tend to the right. For vertical removal angle, again the 41GL129 cache flakes have a wider range (60-80 degrees) than those of the Gibson cache (65-80 degrees), and were removed at more acute angles (87 percent are 60-70 degrees) than those in the Gibson cache (78 percent are 70-75 degrees). For orientation to previous flake, the Gibson cache flakes appear to be about equally left and right as best could be ascertained from the individual flake photos, while those from the 41GL129 cache are 76 percent right flakes and 24 percent left flakes. These comparisons may be more apparent than real because of the small number of flakes in the 41GL129 cache.

Conclusions

Analysis of artifacts from the site and comparison with results of experimental flint knapping to reduce

bifaces indicate that 41GL129 functioned as a temporary hunting and/or raw material procurement campsite for multiple groups of people. Identification of raw materials from which the artifacts were made indicate that the groups traveled within a foraging range that included the upper main stem of the Pedernales River and Meusebach Creek. A possible Paleoindian projectile point distal fragment, a Well-like point, two Pedernales points, a likely Frio-Marcos age biface, a Darl-like/narrow Fairland point, and a likely arrow point preform indicate that prehistoric people used the site infrequently at any one time; however, the components as a whole span most of Texas prehistory. On one of these visits one or more individuals abandoned at least 19 flake tools that had been part of a lithic tool kit procured and used along their travel route between the site and the upper Pedernales River. Interpretation of dated geological sediments in the Pedernales River valley near its confluence with Meusebach Creek and comparison of the cache with three previously reported flake caches indicate that the cache was most likely deposited during the Late Archaic period (4000-1200 B.P.). The study demonstrates that much information can be obtained from very small sites that should not be overlooked.

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List of Authors

Roger Boren, Center for Big Bend Studies, Sul Ross State University, Alpine, TX

J. Kevin Hanselka, Texas Department of Transportation, Austin, TX

Dale Hudler, retired

Raba Kistner, SanAntonio, TX

Bo Nelson, Archeological & Environmental Consultants, LLC, Pittsburg, TX

Timothy K. Perttula, Archeological & Environmental Consultants, LLC, Austin, TX

David Robinson, Texas Archeological Research Laboratory, University of Texas at Austin, Austin, TX

Bob D. Skiles, Austin, TX

Steve Tomka, Cultural Resources Program Director,

Carey D. Weber, retired