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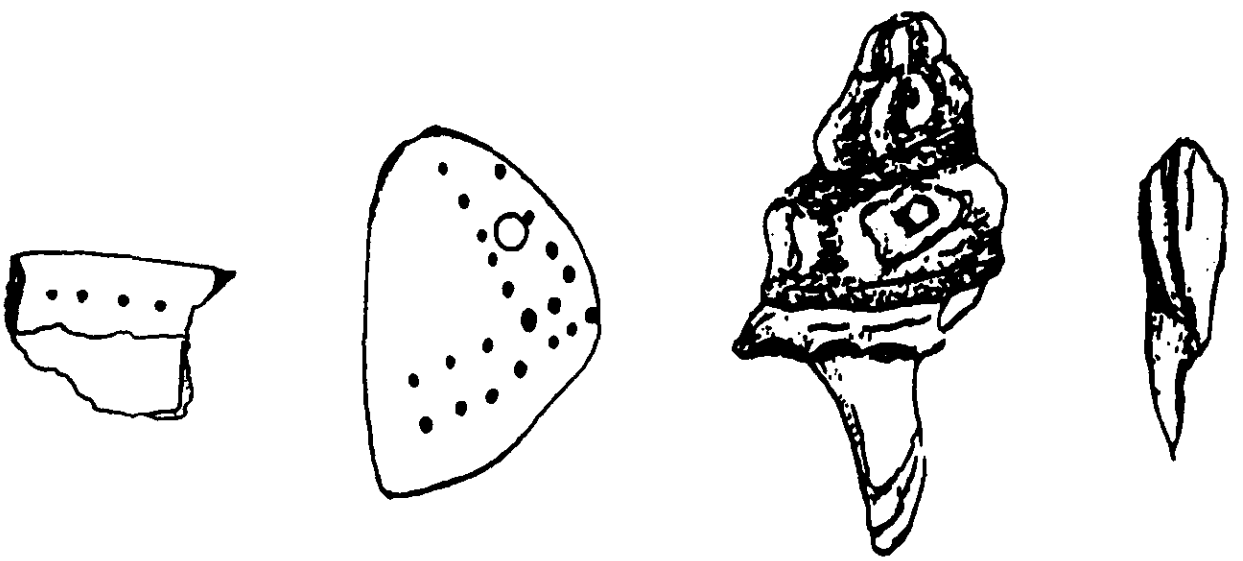

Marine Shell Artifacts from Inland Occupation Sites

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Contents

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Marine Shell Found at Inland Aboriginal Occupation Sites in Wharton and Matagorda Counties, Texas

Joe D. Hudgins

Introduction

This paper concerns marine shell artifacts and marine shell debitage that were recovered from the surface of five aboriginal occupation sites located along the middle Texas coast, approximately 50 to 70 km inland from the Gulf of Mexico. Sites 41WH32, 41WH80, and 41WH83 are located in southeast Wharton County and sites 41MG50 and 41MG52 are located in northeast Matagorda County (see map, Figure 1). Previously, marine shell artifacts reported from this general area have been limited to grave offerings found in archaic cemetery sites, the most notable being the Crestmont site, 41WH39 (Vernon 1989). The only known exception is a historic Indian occupation site, 41WH8 (Hudgins 1984).

The species of marine shell identified from these five sites are as follows: common rangia (*Rangia cuneata*), Eastern oyster (*Crassostrea virginica*), Florida horse conch (*Pleuroploca gigantea*), lightning whelk (*Busycon perversum pulleyi*), and giant Atlantic cockle (*Laevicardium robustum*). Fragments of marine bivalves were found that could not be identified as to species.

Description of Area

The five sites are located along the Caney Creek drainage. With headwaters in northern Wharton County, Caney Creek flows through Wharton and Matagorda Counties, emptying into the Intracoastal Waterway near the town of Sargent, Texas. The early nineteenth century settlers described the area surrounding Caney (originally Canebrake) Creek as having very fertile soil and being heavily forested with cedar, live oak, ash, pecan, and other varieties of hardwood trees. One uncommon aspect of this area is that it contained a forest within a forest. The inner forest was a vast undergrowth of native bamboo (*Arundinaria* sp.). This bamboo could reach a height of 6 to 7 meters, growing so thick it made traveling arduous (Weniger 1984:33-34).

Description of Sites

Site 41WH80

Site 41WH80 is located along the banks of a relic stream on the east side of Caney Creek, approximately 9.5 km east of Wharton, Texas. The site has been in cultivation for several years and artifacts are continually being exposed at the surface. Artifacts and faunal material can be observed on the surface for a distance of approximately 200 meters along the bank of the relic stream, and for approximately 30 meters into the plowed field.

Marine Shell Marine shell artifacts recovered from the surface include two fragments of the body whorl of an unidentified species of conch (Figure 2ab). All sides of these 4-mm-thick fragments have broken and jagged edges. The top part of a Florida horse conch, with the majority of the body whorl removed and part of the distal end of the columella broken (Figure 2c), was also recovered. Also included were a small fragment from an unidentified marine bivalve and 10 small fragments from the body whorl of an unidentified conch.

Lithics Lithic material recovered includes four Gary dart points, one Ensor, one Yarbrough, and one Kent, and two Perdiz arrow points (L. W. Patterson, personal communication n.d.). Six interior flakes and two secondary flakes were also recovered. Additional recovered lithic material includes 16 sandstone abraders of varying sizes. All specimens have some degree of wear on one or both sides. The majority are in the shape of slabs and blocks and vary in thickness from 2 to 3 cm.

Ceramics A small number of ceramic sherds were observed. Sixteen sherds were recovered, and all appear to be of the sandy paste Goose Creek variety.

Faunal Material Shell fragments from unidentified species of freshwater mussel, small fragments of long bone, and 10 teeth (possibly white-tailed deer – *Odocoileus virginianus*) were observed.

Site 41WH83

Site 41WH83 is located approximately 13 km southeast of Wharton, Texas, on the east bank of a relic stream of Caney Creek. The site extends along the bank approximately 400 meters. The width of the site is approximately 50 meters. The area of the site has been in cultivation for several years.

Marine Shell Some of the marine shell artifacts recovered from the surface of the site are illustrated in Figure 3. A diamond-shaped pendant made from an unidentified species of conch is shown in Figure 3a. The pendant has a conical drilled hole at one corner that is broken. It measures 2.4 cm by 3.0 cm, with a thickness of 1.8 mm, and has rounded and smoothed edges. One side has been smoothed more than the other.

A bead made from the columella of a lightning whelk, tubular in shape, 4.5 cm in length, and 1.8 cm in diameter, is shown in Figure 3b,b1. The ends of the bead were abraded to form a flat, smooth surface. Holes were drilled from each end, meeting in the center. The outer surface of the bead was smoothed, but not enough to remove the natural groove of the columella. A cut mark is visible on the outside surface.

A bead blank (not shown) made from the columella of a lightning whelk was also recovered. It is tubular in shape and measures 3.5 cm in length and 1.4 cm in diameter. The ends were abraded to form a flat surface and the sides partially smoothed.

The third illustrated specimen (Figure 3c) is a jagged fragment of unidentified conch measuring approximately 3 cm by 2 cm with a thickness of 5 mm, with the top smoothed and rounded. Four small conical depressions were drilled just below the top edge. The opposite side of the shell has no markings.

The next specimen (Figure 3d), a pendant, was made from an unidentified species of conch and is roughly pear shaped with a conical depression drilled into one side near the top. Below the drilled depression can be seen a number of small worm holes. The pendant measures 3.8 cm in length and 2.5 cm at the widest point. The thickness is 3 mm. Both sides have been smoothed, and the edges are smoothed and rounded.

Another pendant (Figure 3e) was made from the body whorl of a relatively large lightning whelk. It is also roughly pear shaped and measures 6.3 cm in length, 5.5 cm at the widest point, and 5 mm in thickness. There is a broken biconical drill hole near the edge at the wider end. The sides have only been partially smoothed and the edges have a flat surface.

The marine shell artifact shown as Figure 3f was also made from a lightning whelk. At the larger end, the edge has been partially smoothed. The smaller end is jagged and appears to have been broken. The artifact is 6.3 cm long, 4 cm wide at the widest end, and 4 mm thick.

Another marine shell artifact (Figure 3g) is a fragment of the columella of an unidentified conch. It is 6.2 cm in length, 2.5 cm in diameter, and pointed at the distal end. Some smoothing can be observed along both sides.

Marine shell debitage at the site includes three fragments from the top of a lightning whelk and one fragment from a top of a Florida horse conch. In addition, 14 irregularly shaped, jagged fragments of unidentified conch, and eight fragments of giant Atlantic cockle were recovered. One larger fragment of cockle shell is shown as Figure 3h.

Lithics Forty-three secondary flakes and 32 interior flakes were recovered, along with eight small round chert pebbles ranging from 3 to 5 cm in diameter. All of the pebbles appear to have been tested, since one to three flakes had been removed from each pebble.

Dart point types include one Gary, one Kent, one Williams, and one Yarbrough. Bifacial arrow point types include two Perdiz, one Alba, and nine Scallorn. Lithic tools include four side scrapers and two denticulates (L. W. Patterson, personal communication n.d.). Thirty-nine sandstone abraders of varying sizes, ranging in shape from slabs to blocks, were recovered and many more were observed. All specimens have considerable wear on both sides and some have smooth, rounded edges. Thickness ranges from 2 to 3 cm.

Ceramics A total of 115 sherds were recovered and many more were observed. All sherds appear to be of the sandy paste Goose Creek variety. Twelve sherds represent rims from vessels. Eight had smooth, slightly rounded rims; four had notched rims.

Faunal Material Fragments of unidentified species of mussel shells were the most numerous type of faunal material observed on the surface of the site. The valves of two mussels recovered had the margins slightly modified and notched (Figure 3ij). Fragments of animal bones were observed throughout the site. Fifteen teeth of what are thought to be white-tailed deer were found. Also recovered were five deer antler bases with part of the skull still attached. The bases are 2 cm to 6 cm in length and appear to have been removed from the rest of the antler below the brow tine.

Five otoliths from freshwater drum (*Aplodinotus grunniens*) were recovered. An examination of the otoliths indicated the fish were taken in the late winter or early spring (E. Mokry, personal communication n.d.). One otolith has a darkened surface, indicating that it has been exposed to heat.

Site 41WH32

Site 41WH32 is located approximately 13.5 km southeast of Wharton, Texas, along a relic stream east of Caney Creek. The area of this site has been in cultivation for several years and artifacts and other material are exposed at the surface. The site extends approximately 300 meters along the bank of the stream and is approximately 35 meters wide.

Marine Shell Marine shell artifacts recovered include two pendants. One pendant made from the body whorl of an unidentified conch is irregular in shape and had been abraded to form a smooth surface on both sides (Figure 4a). The edges had been smoothed and rounded. On one side of the pendant are 21 small drilled conical depressions, and near one edge is a biconical drill hole. The pendant measures 4.8 cm by 3.0 cm and is 3 mm thick.

The second pendant (Figure 4b) is rectangular in shape with one side smooth and the opposite side only partially smooth. It has two biconical drill holes, one at each end. A small conical depression was drilled near one of the biconical drill holes. The pendant measures 2.0 cm by 1.4 cm and is 2 mm thick.

Marine shell debitage recovered includes two Eastern oyster fragments, eight unidentified conch fragments, and three giant Atlantic cockle fragments.

Lithics Seven interior chert flakes and one secondary flake represent the total amount of lithic debitage observed on the surface. Five dart points and three bifacial arrow points were recovered: three Kent, one Williams, and a Bulverde-like dart point, and one Perdiz, one Alba, and one Scallorn arrow point. Lithic tools include an end scraper and a utilized flake (L. W. Patterson, personal communication n.d.).

Four round chert pebbles ranging from 3 to 6 cm in diameter were observed. Three pebbles had some of the cortex missing.

Ceramics Seventy sherds of sandy paste Goose Creek pottery were recovered and numerous sherds were observed on the surface. Six sherds were from rims of vessels

Faunal Material A small amount of faunal material was observed. Material recovered included 10 teeth, possibly from white-tailed deer, a scute from an alligator (*Alligator mississippiensis*), numerous fragments of unidentified freshwater mussel shell, and the base of a deer antler 2 cm in length with a fragment of skull attached. The antler base had been removed from the antler below the emergence of the brow tine.

Site 41MG50

Site 41MG50 is located approximately 24 km southeast of Wharton, Texas, along a relic stream on the east bank of Caney Creek. This site has been in cultivation for several years. The site extends along the bank of the relic stream for approximately 50 meters and it is approximately 28 meters wide.

Marine Shell Marine shell debitage consists of five fragments of rangia, one fragment of an unidentified marine bivalve, and four small jagged fragments of unidentified species of conch.

Lithics No chert flakes, tools, or projectile points were observed. However, seven block-shaped abraders were recovered. They range from 2 to 3 cm in thickness and have evidence of considerable wear on both sides.

Ceramics Twenty-five sandy paste Goose Creek sherds were recovered and many more were observed.

Faunal Material Faunal material recovered consists of seven teeth, possibly from white-tailed deer. Numerous freshwater mussel shells of unidentified species were observed.

Site 41MG52

Site 41MG52 is located 24 km southeast of Wharton, Texas, and approximately 1.5 km east of site 41MG50. The site extends for approximately 170 meters along the bank of a relic stream located east of Caney Creek and is approximately 25 to 30 meters in width.

Marine Shell Marine shell found on the surface includes a fragment of a pendant made from the body whorl of a relatively large lightning whelk (Figure 5a). One end is broken and jagged and the

other end is partially jagged with a biconical drill hole near the edge. Another biconical drill hole is located near one of the lateral edges. Evidence of smoothing can be seen on both sides of the specimen and also on the lateral edges. The pendant measures 8.2 cm in length, 5.5 cm in width, and 4 mm in thickness.

A Florida horse conch found at the site has part of the body whorl and part of the columella removed (Figure 5b). The remaining part of the columella has been smoothed at the distal end. The length of the conch is 8.2 cm, and the maximum width is 5.0 cm.

Also found were distal ends of two columellae from unidentified species of conch. The distal end of one specimen has a very sharp point (Figure 5c). The distal end of the other columella fragment has been rounded and smoothed (Figure 5d). Marine shell debitage include 15 fragments of unidentified conch and three small fragments of giant Atlantic cockle.

Lithics Lithic debitage consists of two primary chert flakes, seven secondary flakes, and three interior flakes. In addition, there were four round chert cobbles ranging from 4 to 7 cm in diameter.

Projectile points recovered include two unclassified dart points, one Gary dart point, and four Scallorn arrow points (L. W. Patterson, personal communication n.d.). Fourteen block-shaped abraders of various sizes were also found, ranging in thickness from 2 to 3 cm.

Ceramics Fifteen sandy paste Goose Creek sherds were collected as a sample of the ceramics from the site. Numerous sherds of the same variety were observed on the surface.

Faunal Material Unidentified species of freshwater mussel shell were observed scattered randomly over the site surface. Bone fragments and seven teeth, possibly from white-tailed deer, were also observed. In addition, a deer tine measuring 3.5 cm in length and the base of a deer antler, 4.2 cm in length, with part of the skull attached, were found.

Discussion

Marine shell found on the five sites can be categorized as ornaments, tools, or debitage. It is difficult to determine whether the ornaments or tools were made at the sites or were brought to the sites. The diamond-shaped pendant and the tubular bead found at site 41WH83 (Figure 3a,b) and a pendant from 41WH32 (Figure 4a) appear to be finished ornaments. However, a bead blank found at 41WH83 (not illustrated) and two pendants (Figure 3d,e) possibly represent unfinished or rejected ornaments.

Tools made from conch columellae found at 41WH83 (Figure 3g) and 41MG52 (Figure 5c) closely resemble gouges and awls found at sites along Oso Creek in Nueces County, Texas (Steele and Mokry 1985: Figure 3). Two Florida horse conch found at 41WH80 (Figure 2c) and one from 41MG52 (Figure 5b) may also represent gouges.

Several spines missing from the top portion of the conch found at 41MG52 may indicate that it was also used as a hammer, as well as a gouge. The two fragments of Eastern oyster found at 41WH32 may have been used as cutting or scraping tools, and the fragments of giant Atlantic cockle found at all five sites may have been used as tools to scrape hides or smooth pottery vessels. The common rangia found at site 41MG50 also may have been used for utilitarian purposes.

Marine shell debitage and the presence of large quantities of sandstone abraders, especially at 41WH83, provide convincing evidence that some ornaments and tools were made at the sites. Sandstone abraders can be used for various purposes, including the shaping and smoothing of marine shells into ornaments and tools (Mokry 1980).

Except for sites 41WH32, 41WH80, and 41WH83, and the previously mentioned Late Archaic cemetery sites and historic Indian site, the recorded occupation sites in eastern Wharton County had no marine shell in any form. The majority of these approximately 70 sites are multicomponent sites and many, notably 41WH19, have evidence of long occupation sequences, ranging from the Late Paleo through the Late Prehistoric periods (Patterson et al. 1987). By contrast, diagnostic projectile points found at 41WH32, 41WH80, 41WH83, and 41MG52 indicate that these sites were occupied from the Late Archaic through the Late Prehistoric periods.

The Caney Creek drainage area in Wharton and Matagorda counties, where the five sites with marine shell are located, has a variety of faunal and floral resources, including an abundance of native pecan trees. Today, this area contains approximately 80% of the native pecan trees in Wharton County and 70% of those in Matagorda County. Even though many native pecan trees have been removed from this area because of farming, it is not uncommon for there to be a harvest of one million pounds of native pecans in Wharton County alone during the months of October through January (Bernard Mitchell, personal communication n.d.).

The presence of marine shell artifacts at the five sites in the prime native pecan area, and the absence of marine shell at all (approximately 70) known eastern Wharton County occupation sites located nearby but outside the prime pecan area, indicate that the marine shell was likely brought in by coastal peoples when they came to eat and gather pecans, rather than acquired by local peoples via trade or travel to the coast. Further support for this is given by Cabeza de Vaca in his 16th century report that coastal groups would go inland 10 to 12 leagues above the Bay and remain for two months, gathering and eating pecans (Covey 1993). Pecan gathering in these inland areas probably occurred many centuries before Cabeza de Vaca landed on the Texas coast.

Status of Sites and Disposition of Artifacts

Sites 41WH80, 41MG50, and 41MG52 continue to be cultivated annually. Site 41WH32 has been converted from row crop farming to turf grass farming. Approximately two-thirds of site 41WH83 has been converted from farming to pasture land, with the remaining area of the site still in cultivation.

Black and white photographs were taken of the marine shell, sandstone abraders, and projectile points. All artifacts and faunal material collected were given to the respective land owners, as agreed upon prior to the survey of the sites.

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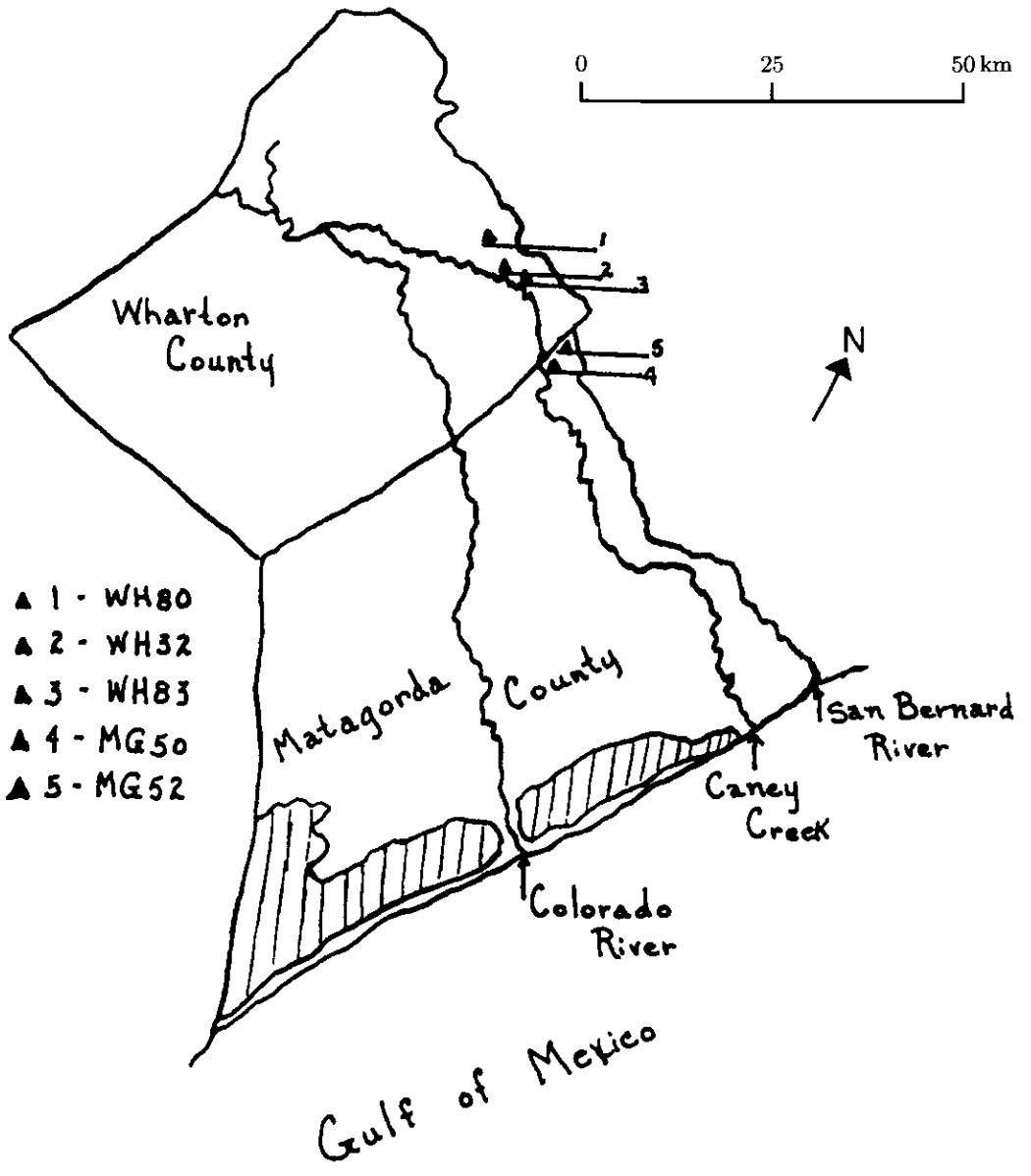
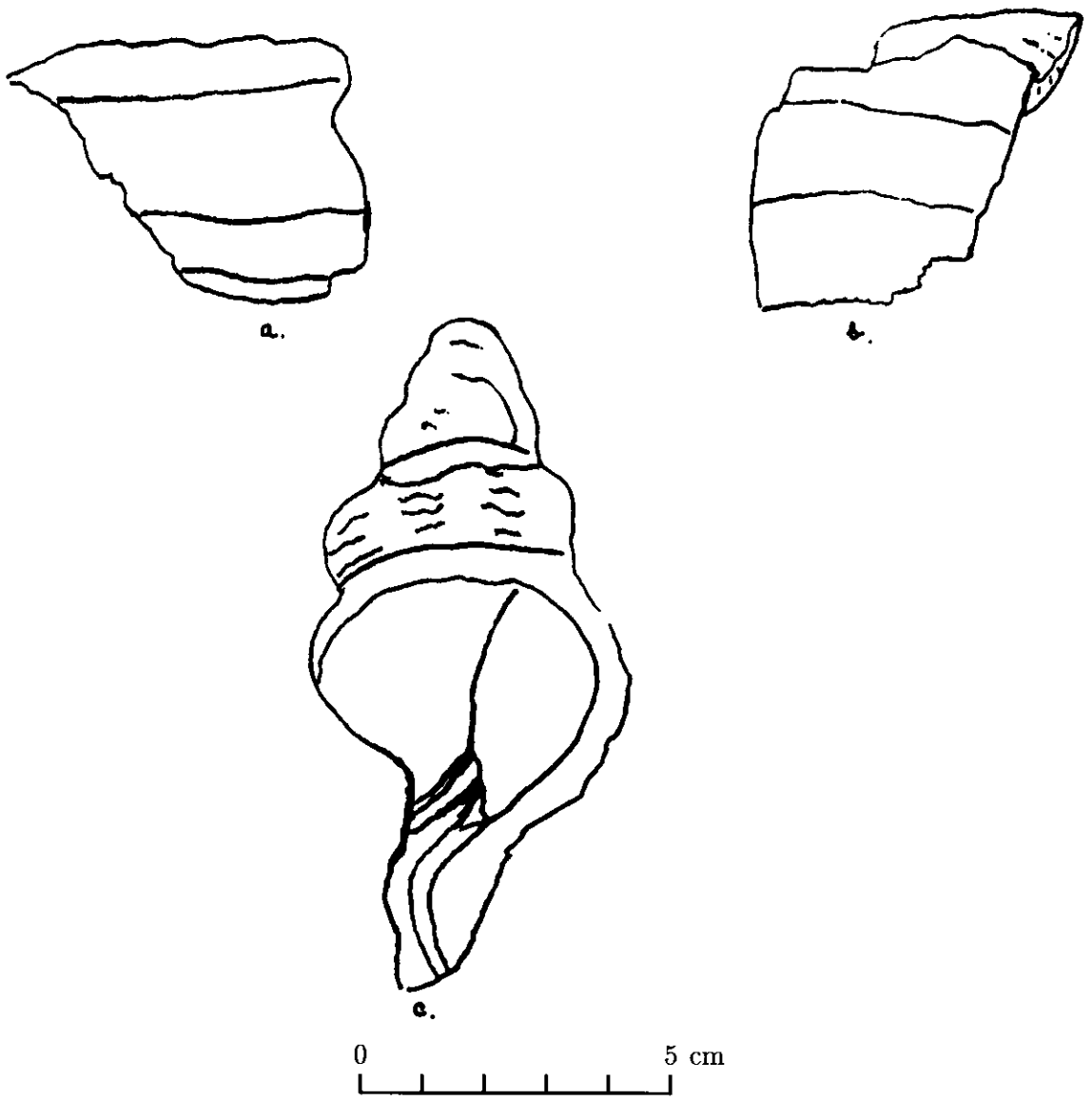
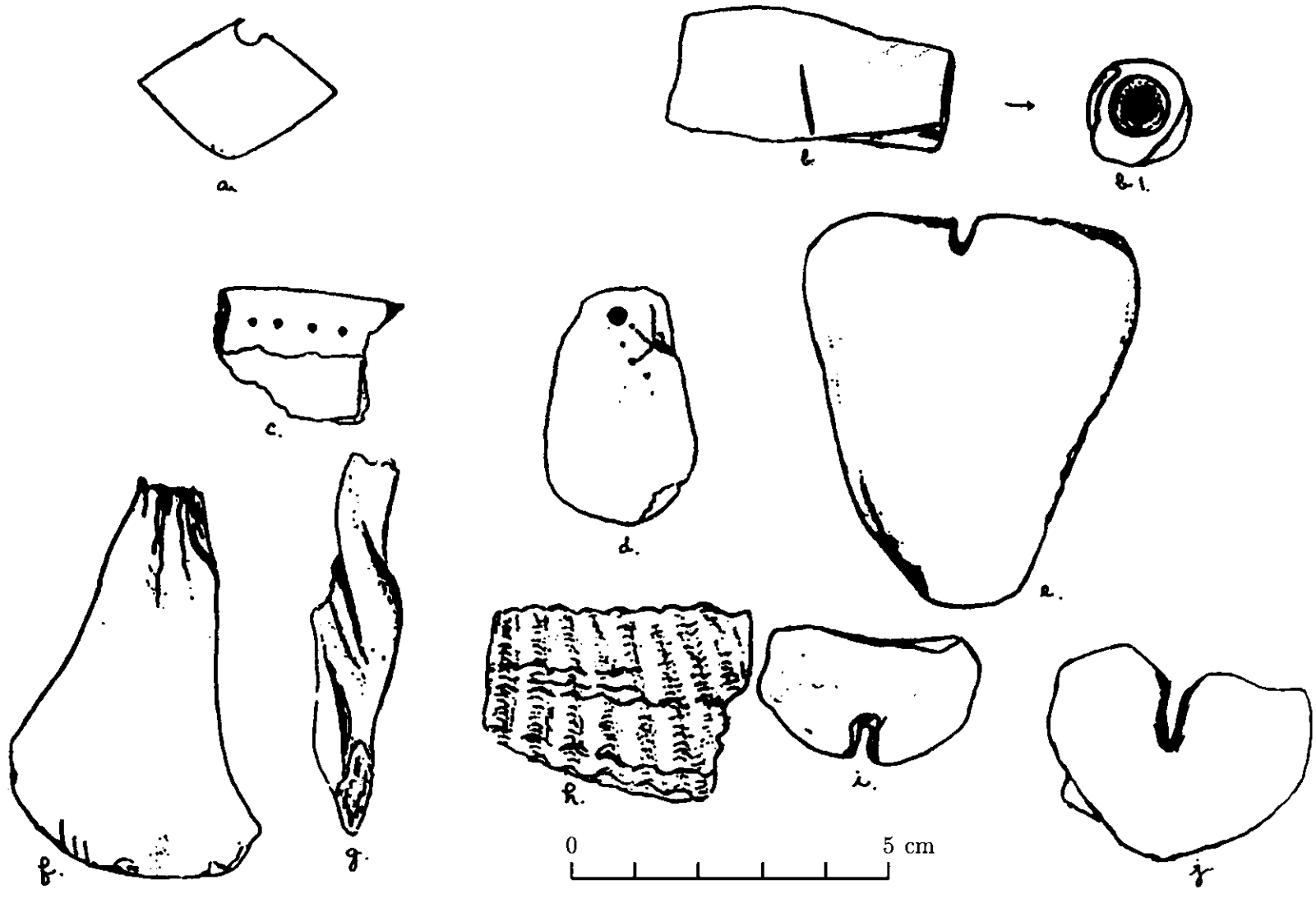


Figure 1. Wharton and Matagorda Counties, Texas, with the Locations of Sites with Marine Shell



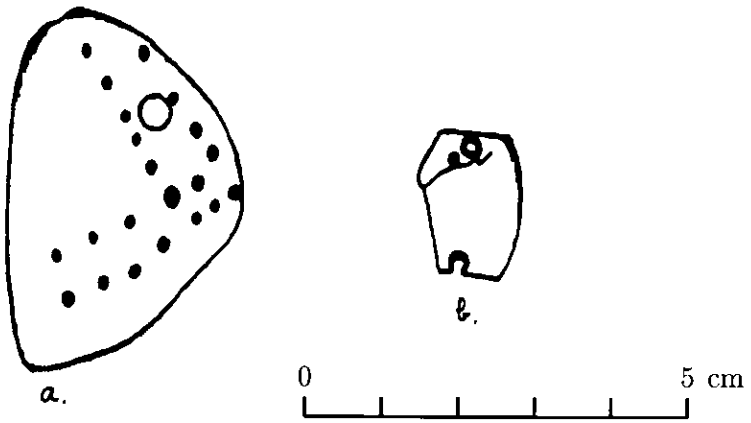
a,b – fragments of body whorl from unidentified species of conch;
c – Florida horse conch with a majority of the body whorl and columella removed

Figure 2. Marine Shell from Site 41WH80



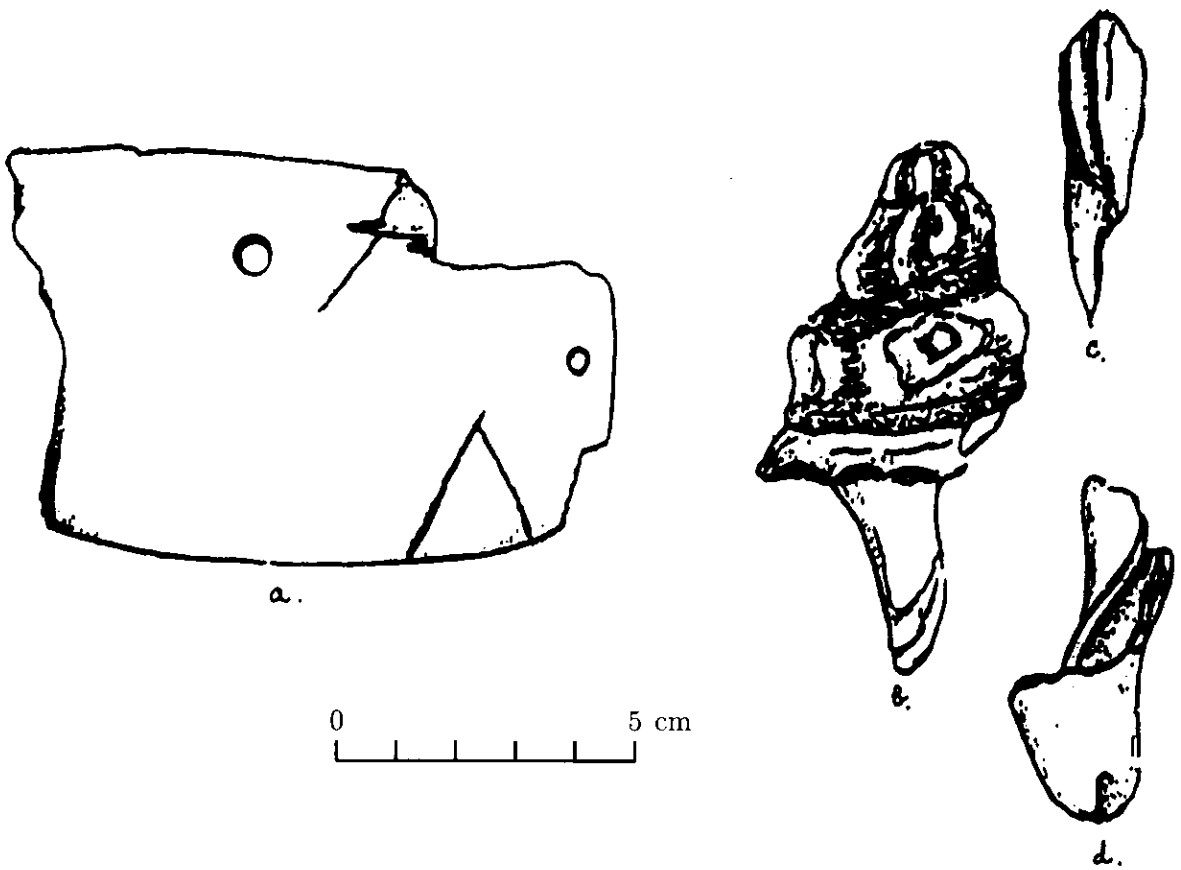
a – diamond-shaped pendant with broken drill hole; b, b1 – tubular bead made from columella of a lightning whelk; c – fragment of conch shell with four drilled depressions; d – pear-shaped pendant with drilled depression near top; e – pear-shaped pendant with broken drill hole; f – fragment of lightning whelk with larger end partially smoothed and smaller end broken; g – fragment of distal portion of columella with pointed end; h – fragment of giant Atlantic cockle; i, j – freshwater mussel with modified edges and deep notches

Figure 3. Marine Shell and Worked Freshwater Mussel Shell from Site 41WH83



a – conch shell pendant with drill hole and drilled depressions; b – pendant with two drill holes

Figure 4. Two Marine Shell Pendants from Site 41WH32



a – pendant fragment from body whorl of a lightning whelk; b – modified Florida horse conch with distal end of columella smoothed; c – distal end of columella with very sharp point; d – distal end of columella smoothed and rounded

Figure 5. Marine Shell Pendant and Other Marine Shell Artifacts from Site 41MG52

Systematic Classification of Geological Contexts in Archaeological Sites

Britt Bousman,[1] Brett Houk,[2] Lee Nordt,[3] and Paul Goldberg[4]

Much of the recent literature on archaeological site formation processes identifies and characterizes those processes that lead to the creation of archaeological sites and the post-depositional processes that disturb the context of materials on archaeological sites (Schiffer 1972, 1987). For example Waters (1992) and Goldberg et al. (1993) are replete with such discussions. For very good reasons, these debates are normally organized along process dimensions, but another manner of organizing site formation contexts is by the results of the various processes. In this brief presentation we discuss the end-products created by various geologic, pedogenic, and biologic processes in terms of hunter-gatherer archaeological sites, features, and artifacts. Although we fully acknowledge the importance of studying and understanding these processes and applaud efforts to do so, we choose to change the focus to a systematic classification of the end-products.

We suggest that the terms *archaeological* or *cultural deposits* be limited to those situations where humans have formed true deposits, e.g., pit fills or rubble walls, and should not be applied to a naturally deposited matrix that encases discarded artifacts. In this approach, primary and secondary context only refer to the geological setting of cultural materials. In a primary context, artifacts retain their original associations *and* discard location regardless of the nature of the cultural process(es) which created them. In a secondary context, these artifacts have lost their original association or discard location through one or more processes.

The various end-products can be grouped by *Primary Contexts* (Figure 1) and *Secondary Contexts* (Figure 2).

Primary Contexts	Secondary Contexts
a. Good Geological Context	a. Bioturbated Palimpsest
b. Good Surface Context	b. Lag Palimpsest
c. Compressed Stratigraphy	c. Mixed Context
d. Surface Palimpsest	d. Redeposited Context
	e. Reversed Stratigraphy

I. Primary Contexts

Good Geological Context

Archaeological materials are discarded in a geological context that covers the materials by low energy deposits which do not move artifacts or materials in any appreciable manner. In some settings archaeological occupations/components are separated by sterile deposits.

Good Surface Context

Archaeological materials (artifacts and features) from a single occupation or component are discarded on a stable surface. These materials undergo little horizontal or vertical movement.

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Compressed Stratigraphy

Archaeological materials are discarded in very slowly accumulating deposits but in correct stratigraphic order. The physical separation is noticeably less than occurs in other sites with good geological context.

Surface Palimpsest

Artifacts and/or features from multiple occupations are deposited on stable surfaces, usually bedrock, where the artifacts from different components are intermingled.

II. Secondary Contexts

Bioturbated Palimpsest

Archaeological materials are discarded on a stable surface; however, pedo-geological processes and biological activity below and on that surface move artifacts at various rates in multiple vertical directions.

Lag Palimpsest

Archaeological materials are discarded in an accumulating depositional environment, but later, usually either by wind or water erosion, the artifacts become intermingled on an erosional surface.

Mixed Context

Archaeological materials are discarded in an accumulating depositional environment, but later, through rodent burrowing, tree falls, or other forms of bioturbation or soil processes, materials from distinct occupations or components are vertically mixed.

Redeposited Context

Archaeological materials are discarded in an accumulating depositional environment but later, either by wind or water erosion, artifacts are transported to another sedimentary unit.

Reversed Stratigraphy

Archaeological materials are discarded in an accumulating depositional environment, but later, either by wind or water erosion, artifacts are redeposited in another sedimentary unit and in reversed chronological order.

Discussion

We can not simply place sites in these categories and thoughtlessly use these classifications to judge their significance in regard to further archaeological investigations. For example, it would be a mistake to exclude all sites in Secondary Contexts or only investigate sites that fall within the category of Good Geological Contexts. This logic is too simple and does not fully take advantage of the full wealth of data in the archaeological record. Context is but one aspect on which to judge site significance. Other aspects include the regional database and our knowledge of the archaeological record as well as the ability of a site to answer specific research questions defined in the literature or research designs.

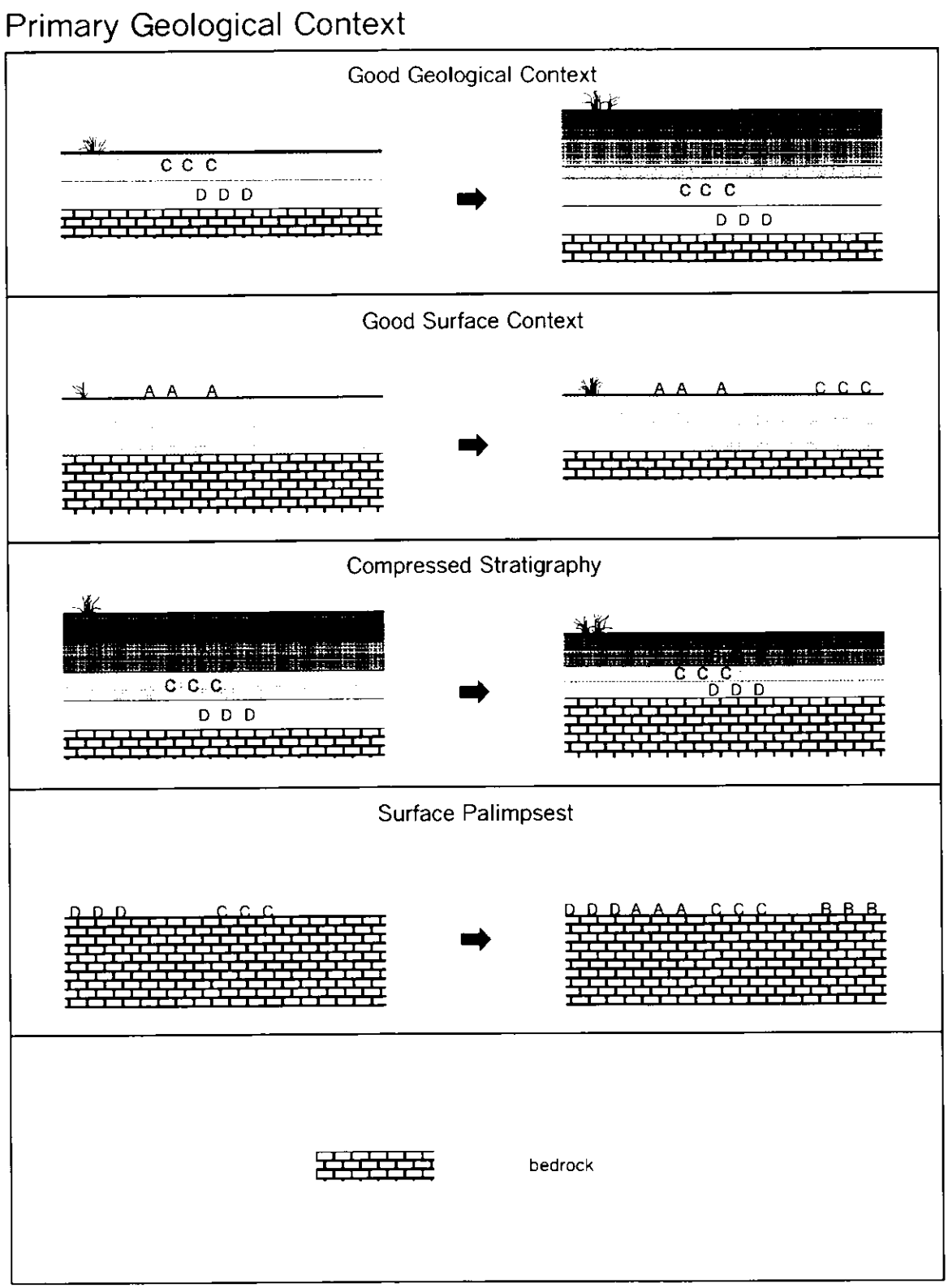

Figure 1. Primary Geological Contexts

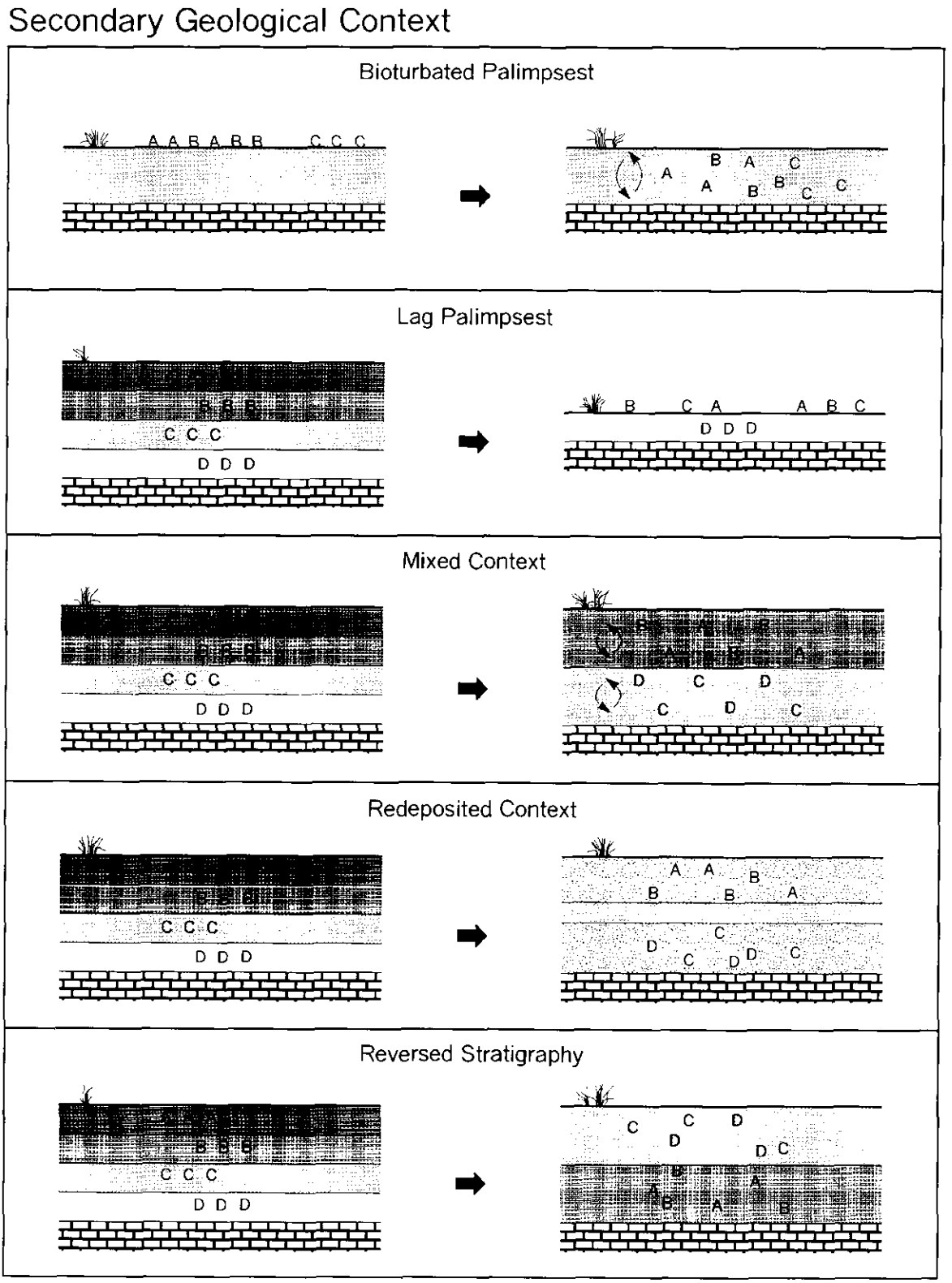

Figure 2. Secondary Geological Contexts

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Bulverde and Williams Dart Points in Southeast Texas

Leland W. Patterson

Introduction

Bulverde and Williams dart points are Central Texas types (Turner and Hester 1993) that were also used in Southeast Texas. This article presents data on the chronologies and geographic distributions of these point types in Southeast Texas. The social significance of the geographic distributions of these projectile point types is also discussed.

Turner and Hester (1993) and Suhm and Jelks (1962) have given detailed descriptions of Bulverde and Williams points. The Bulverde point has a triangular body, well-defined shoulders (often barbed), and a stem with straight edges and a wedge-shaped cross section. The Williams point is a broad, triangular point, with a corner-notched stem and a convex base.

Bulverde-like points are found in Southeast Texas that are similar to Bulverde points, but which have stems with uniform cross section, instead of being wedge-shaped as are Bulverde points. Data are given here on Bulverde-like points in this region. Bulverde-like points may represent a manufacturing variation of the Bulverde point, or a manufacturing variation of the Kent point, which also has straight stem edges.

All data given here are from the 1998 update of the computerized data base for inland Southeast Texas (Patterson 1989).

Chronologies

The Bulverde point is placed in a time period of 3000-2500 BC in Central Texas by Turner and Hester (1993:82). This corresponds to the early part of the Middle Archaic (3000-1500 BC) period in Southeast Texas. Prewitt (1981) places the Bulverde point in Central Texas at a somewhat later time period than Turner and Hester, in the Marshall Ford phase at 2000-1400 BC. The estimates for the time period of the Bulverde point by Turner and Hester and by Prewitt together cover the complete time range of the Middle Archaic (3000-1500 BC) period in Southeast Texas.

No radiocarbon dates are available for the Bulverde point in Southeast Texas. However, the Bulverde point can be placed in the Middle Archaic period in the stratigraphic sequences at sites 41FB42 in Fort Bend County (Patterson et al. 1993) and 41HR315 in Harris County (Patterson 1980). It should be noted that no dart point type in Texas has enough radiocarbon dates to establish a statistically reliable total time range.

The Williams point in Central Texas is placed in the Middle to Late Archaic by Turner and Hester (1993:194). Prewitt (1981) places the Williams point in the San Marcos phase with a time range of 600-300 BC, which is the last part of the Late Archaic period (1500 BC-AD 100) in Southeast Texas. The total time range for the Williams point in Southeast Texas has not been defined. Williams points can be placed in the Late Archaic period in Southeast Texas, at sites 41FB42 in Fort Bend County (Patterson et al. 1993: Figure 7A), 41HR315 in Harris County (Patterson 1980: Figure 12D), and 41WH39 in Wharton County (Vernon 1989: Figure 6c).

Geographic Distributions

Geographic distributions of Bulverde, Bulverde-like, and Williams points in Southeast Texas are given by county in Table 1. Harris County has the largest number of Bulverde and Williams points because of the large amount of survey work done in this county. The geographic distributions

are shown on maps of Southeast Texas, in Figure 1 for the Bulverde point and Figure 2 for the Williams point.

Distributions of these point types for the western, central, and eastern zones of Southeast Texas are given in Table 2. Bulverde and Williams points are fairly evenly distributed from west to east in this region. These distributions do not fit a dropoff model from west to east that would be expected of Central Texas type points. The technological traditions for these two point types penetrated farther east into Southeast Texas than for some other Central Texas point types. For example, there is a sharp dropoff of the frequency of Pedernales points in the eastern zone of Southeast Texas (Patterson 1996: Table 7).

Data on the numbers of Bulverde, Bulverde-like, and Williams points at individual sites can be obtained from the computerized data base for inland Southeast Texas (Patterson 1989). References to published reports on individual sites can be obtained by using the site number cross-index in the bibliography for Southeast Texas (Patterson 1997).

Social Significance of Point Types

It is not possible to identify specific social groups by the use of different projectile point types (Patterson 1990). Methods of movement of technological traditions can be considered, however. Use of a projectile point type can move from a geographic area to an adjacent geographic area by movement of people (migration) or movement of ideas (diffusion). Movement of people can be in the forms of movement of a social group or movement of a single individual who joins another social group in an adjacent area. Movement of technological ideas occurs by contact between different social groups. The geographic distribution of a projectile point type can far exceed the influences of local social groups, by chain-like diffusion, as shown by Justice (1987) for many projectile point types.

Technological Transition

The development of the Bulverde point seems to be an evolution from earlier stemmed point types, such as Nolan in Central Texas and Early Stemmed in Southeast Texas. The Williams point may represent the start of a notched stem dart point tradition in Central Texas, which evolved to later forms such as the Ellis corner-notched point. The Ellis corner-notched point is similar to the larger Williams corner-notched point, and may simply represent a trend toward the use of smaller dart points in later time. At site 41WH39, points that could be classified as Williams (Vernon 1989: Figure 6c) and Ellis (Vernon 1989: Figure 6d) were found together with a single skeleton of the Late Archaic period. This could represent a single individual making different size dart points from different size flake blanks. In this case, different type dart points are not involved, but rather the manufacture of different size corner-notched points from different size flake blanks. This is an example where naming of dart point types may be an over-classification in terms of social significance.

Summary

This article has discussed the chronologies and geographic distributions of Bulverde, Bulverde-like, and Williams dart points in Southeast Texas. The Bulverde point can be placed in the Middle Archaic period in this region. The time range for the Williams point is not defined yet for Southeast Texas, but there are examples in the Late Archaic period.

The geographic distributions of Bulverde and Williams points are fairly uniform across Southeast Texas. These geographic distributions do not conform to a geographic dropoff model for frequencies of points that might be expected for these Central Texas point types.

The Bulverde point type seems to have evolved from earlier stemmed point types. The Williams point type may represent the start of a new notched point tradition in the Middle to Late Archaic.

This study is another example of the advantages of using a computerized regional data base. All of the data used here were easily obtained by a series of data base queries.

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Table 1. Distributions of Bulverde, Bulverde-like, and Williams Points

	Bulverde		Bulverde-like		Williams	
county	sites	points	sites	points	sites	points
Austin	2	2			1	1
Brazoria	2	5			1	1
Fort Bend	9	39	4	38	3	19
Grimes	2	2			1	1
Harris	20	70	5	9	18	32
Jasper	1	1			2	4
Jefferson	1	1			1	4
Liberty	9	24			3	5
Polk	6	16			2	7
San Jacinto	1	1			1	1
Tyler	1	2			1	8
Walker			1	1		
Washington					1	1
Wharton	7	10	5	18	7	10
	61	173	15	66	42	94

Table 2. Point Distributions by Zone

	western		central		eastern	
type	sites	points	sites	points	sites	points
Bulverde	20	56	22	72	19	45
Bulverde-like	9	56	6	10		
Williams	14	32	18	33	10	29

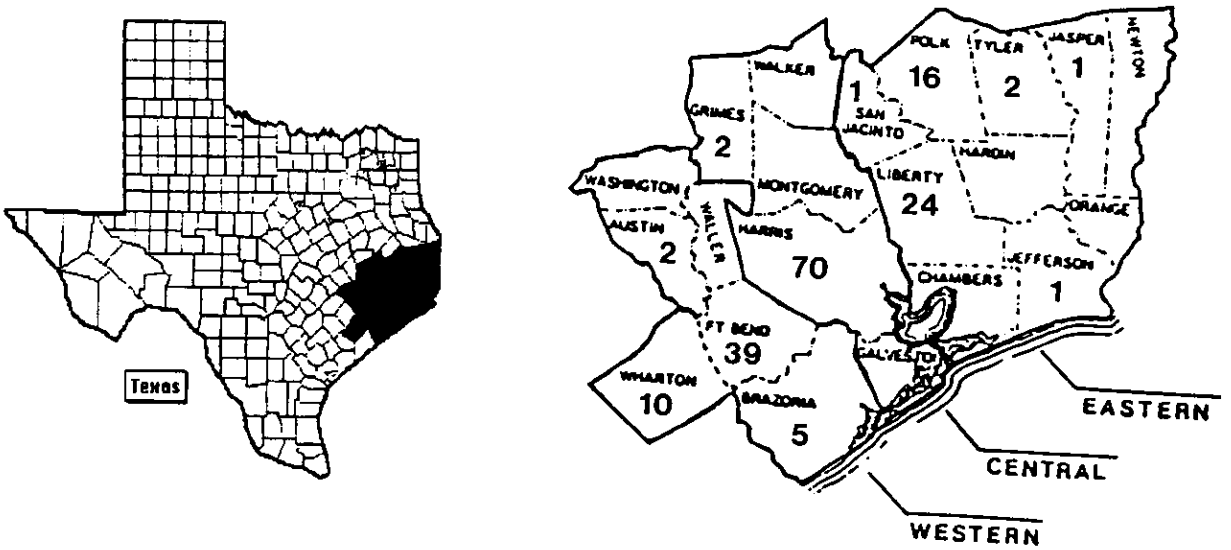

Figure 1. Bulverde Points in Southeast Texas

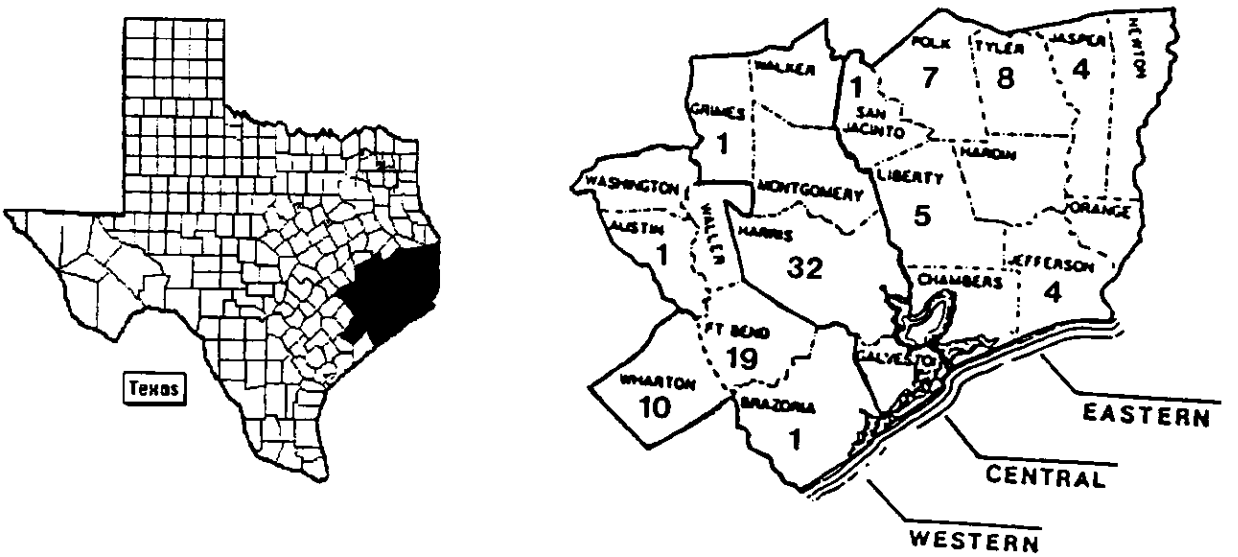

Figure 2. Williams Points in Southeast Texas

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