A Collection of Papers Reviewing the Archeology of Southeast Texas

Report Number 5 Houston Archeological Society

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A Collection of Papers Reviewing the Archeology of Southeast Texas

edited by

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A Collection of Papers Reviewing the Archeology of Southeast Texas: An Introduction

Patricia Wheat

Scientific investigations of archeological sites which have been conducted over the last 30 years in Southeast Texas have greatly enriched our interpretation of history and our understanding of prehistory. The results of these investigations are usually reported in journals, such as the Bulletin of the Texas Archeological Society and the Houston Archeological Society Journal, and technical papers which are circulated among the archeological community. The general public seldom sees this wealth of information which results from these investigations.

The purpose of this publication is to relate the results of local archeological investigations to the general public so that a greater appreciation of archeology and its contributions will exist. This is not intended to be a definitive or complete survey of archeology of the area; many archeologists have made significant contributions to the archeological record but could not participate in this review.

This collection of papers will give the reader an overview of the diversity, antiquity, and density of archeological investigations for the area. We thank the authors who have given willingly of their time and expertise to submit their papers for public review. Due to the nature of the publication, the request for papers included a word limit which also limited the details which could be included. Thanks are also due Texas Eastern Corporation for funding the printing of this publication.

The authors did a fine job in refraining from the use of technical jargon, but some specialized vocabulary necessarily remains. A brief explanation follows:

archeology (archaeology) both spellings are considered correct and are used as the authors submitted them

artifact anything made or modified by humans

atlatl spear thrower

balk earth left untouched which results in a wall left between excavation units

B.P. before present, present being defined as A.D. 1950

ceramic made of clay and fired

chert (flint) stone from which Indians commonly made tools

dart spear thrown with an atlatl

debris discards or remains not wanted

ethnography descriptive record of habits and customs

fauna animal

fluted a point with a channel or groove extending lengthwise

grog a temper made from crushed potsherds

haft to fix a shaft to a weapon or tool, usually with a binding or adhesive

lithic of stone

midden trash pile

obsidian naturally occurring volcanic glass, highly prized for making stone tools

point (projectile point) the sharpened end of a spear, dart, or arrow; usually made of stone or bone. The commonly, but mistakenly, used term for a stone point is 'arrowhead'; most 'arrowheads' were not part of an arrow, but of a spear or dart.

sherd (shard) piece of broken pottery

site designation Example: 41 HR 25
41 = state number (Texas)
HR = county designation (Harris County)
25 = site number for county (25th site in Harris County)
Site numbers are assigned in the order in which they are reported; in Texas, sites are reported to the Texas Archeological Research Laboratory, Austin.

stem portion of a point or tool where shaft or handle is hafted

stratum (plural: **strata**) layer

temper in pottery manufacture, material such as sand or ground bone that, when mixed with the clay before firing, makes it less likely to shatter when heated

It is our sincere hope that this collection of papers will encourage appreciation and support for the archeological projects needed to enrich our understanding of our heritage.

Indians of the Texas Gulf Coast: A Synthesis of Archeological, Historical and Theoretical Information

Joan Few

Paleo-Indian time period

The first inhabitants of Texas are called Paleo-Indians, and their environmental adaptation is called the big game hunting adaptation. Their time period was that of the late Pleistocene (end of the Wisconsin Ice Age from about 10,000 B.C. to 6000 B.C). It was a much colder and wetter environment than we have now. Here in our coastal region, the gulf shore line was 50 to 100 miles further south than it is today. Forests were more coniferous and there existed in North America greater numbers of large herd animals such as woolly mammoth, mastodon, *Bison antiquus* and caribou. These large animals could provide the food, clothing, shelter and tools needed for the survival of the Paleo-Indian. The Paleo-Indian technology, which developed around the killing of large animals (such as the wooly mammoth), was the use of spears, lances and darts to the end of which were attached well-made, usually fluted points (points containing a central groove used in hafting the point onto the spear) of flint or obsidian. These fluted points are called Clovis and Folsom points and they have been found in the Texas coastal region. Bone tools as well as numerous different kinds of stone tools made up the Paleo-Indian's tool kit. Hides were processed for clothing, shelter, storage and cooking containers. Our understanding of the Paleo-Indian way of life in Texas is drawn from information gathered from archeological excavations all over North America. A fossilized *Bison antiquus* bone, which had been worked into a sharp-pointed tool, was found during dredging for the Texas City dike in Galveston Bay. The same type of bison bone tool was found in the Yukon's Old Crow Basin (Canby 1979:336). The Old Crow River region provides evidence of humans in America as far back as 30,000 years ago, "but clear knowledge of the human occupants of northwesternmost America before 11,000 years ago is elusive" (Dumond 1980:984).

Fossils of many different Ice Age animals were found during the dredging of the Texas City dike, including bison, mammoth, horse, glyptodon (armadillo), saber tooth tiger, llama, tortoise and alligator. Some fossils show marks indicating they were used by people as tools and other fossils show suggesting marks that the animals may have been butchered for food. Some of these fossils are now housed at the Houston Museum of Natural Science.

During this Paleo-Indian period, hunting was a social event, requiring cooperation and planning. Indians were migratory, following the herds. They lived in small bands of about 30, but would, when necessary for hunting or rituals, gather (aggregate) into large groups . The thing which may have been the Paleo-Indians' greatest asset was their flexibility. They could move wherever the animals led them, which increased their chances for survival.

The Archaic period

As the Pleistocene ice began to recede, the move into the Holocene brought about changes. The big game hunting way of life continues, but we see changes in the archeological content. Mammoth, mastodon and *Bison antiquus* remains are seen less and less, and a more modern bison evolves as the main game. The association of extinct herd-animal bones with human debris ends about 8000 years ago (6000 B.C.).

As the ice sheets receded, the climate across the United States became dryer and hotter. River channels changed as glacial melt from Canadian glaciers rushed to the sea and the sea began to rise. In the forest regions, the coniferous forest gave way to the deciduous. In the wooded areas, the

animal most hunted became the deer. Hunting became a single-person or small-group activity, not a social activity as it was during the Pleistocene. This brought about changes in the social structure. The accepted theory at this time is that the people of the Holocene became hunters and gatherers within a given territory. Texas Coastal Indians probably lived by a seasonally selective exploitation of frequently abundant resources. This hunting and gathering adaptation to the Holocene is called the Archaic period.

The points used by the Archaic hunters were different from those of the Paleo-Indian hunters. Points were still attached to spears (darts) but they frequently had barbs (sharp extended points at the base) and were generally more triangular in form than the Paleo points. Archaic Indians and possibly Paleo-Indians used an atlatl (a spear thrower) to help them throw farther and with more accuracy.

Archeological evidence indicates that Archaic Indians lived in bands, small groups of usually related members. They were probably members of a much larger group which aggregated once or twice a year. They were nomadic with frequent moves to follow food sources, but within a given territory. All ecological zones within a given region were not available to all bands. There was sexual division of labor with the men doing the hunting and the women doing the gathering.

The Late Prehistoric period

The Late Prehistoric period (sometimes called the Ceramic period, 100 A.D. to 1500 A.D.), brought significant technological changes to the coastal Indians. The bow and arrow, which appeared about 600 A.D., became an important tool with a much smaller-size projectile point (arrowhead). Stone tool kits included drills, perforators, scrapers, hammers, net weights, knives and any tool requiring a sharp edge. Animal bone was also used to make tools, projectile points, jewelry, gaming pieces and musical flutes. Shells were used as tools, trade items and jewelry. Ceramics are found in sites dating within this period. Pots were made of local clays and frequently carried simple rim designs.

Indian cemeteries which date within this period have been found in the coastal region. Many important artifacts that reveal the way of life of individuals and groups are located with the burials. The scientific study of the remains of people living before the historic period is a valuable source of information about their health, diseases, diet, stature, life expectancy, population, etc. This hunting-gathering adaptation continued until historic times in our coastal area . In the Mississippi River valley and in the Southwest, agriculture was introduced by way of Mexico about 0 A.D. No evidence of agriculture prior to European intervention has been found in the Houston area.

Contact between Europe and America

In 1529, Cabeza de Vaca became the first European to set foot in Texas who later wrote about his experiences (Covey 1983). He gave us an ecological, technological, social and ethnographic picture of the Indians in our coastal area. We call them the Karankawa Indians but DeVaca recorded two groups living on what appears from his description to be Galveston Island, and they called themselves the Capoques and the Han. They were all tall and well built (Covey 1983:61). De Vaca viewed the final stage of the Late Prehistoric period and witnessed some of the changes which resulted from contact with the Spaniards. During the first winter he spent with the Indians, half of the Indians died from dysentery infected by the Spaniards (Covey 1983:60).

DeVaca describes the upper Texas coast as a region of sandy islands, estuaries and coastal marshes. Inland, the woodlands gave way to rolling plains with flowing rivers whose banks were often lined with pecan trees. None of these ecological zones were capable of year-round support, resulting in a seasonal migratory pattern. DeVaca lived with the coastal Indians for over a year

and he described their yearly rounds. October through February found some bands on the coastal islands where the women dug underwater roots, and fish were taken in cane traps. During some winter periods oysters and water were the only sustenance. The Texas coastal region contains many Indian shell middens (trash piles) of saltwater oysters and brackish-water clams. These middens contain artifacts reflecting the Indian way of life. Blackberries were harvested in April and May. June and July was the time when coastal Indians moved inland to harvest the fruit of the prickly pear tuna (*Opuntia tuna*), a cactus found in the dry regions of central and South Texas.

Family bands were able to gather in larger family units when surpluses were available, such as during the blackberry season when dance ceremonies and fiestas were held. In the fall, during the pecan harvest, and during the summer tuna season, in good harvest years, aggregations were also possible for the bands.

"There is no chief. All belonging to the same lineage keep together," said de Vaca, (Covey 1983:63). The extended family was probably the core of the bands. Villages were temporary and houses were huts made of mats, sometimes open, sometimes large, with multiple fires inside. Along the coast, floors of huts were covered with oyster shells, and animal skins were put down for sleeping. Their technology included pottery, bows, arrows and cane fish traps. Sexual division of labor was practiced with women doing the gathering. DeVaca also stated that, "their women toil incessantly" (Covey 1983:61).

"The people are generous to each other with what little they have" (Covey 1983:63). Sharing was the rule, with a host giving all to his guest. After marriage, a married daughter would take all of her husband's game to her father's house; they in return would be provided for by her father. Another custom was that a bride's parents could not enter the house of their son-in-law nor he theirs, nor could they speak to each other (Covey 1983:62). (This custom was common among North American Indians.) DeVaca also remarked in his journal, "These people love their offspring more than any in the world and treat them very mildly" (Covey 1983:61).

Shamans (medicine men) were viewed as unusual men. De Vaca , at the strong encouragement of the Indians, became a medicine man, which may have made it easier for them to accept him into their band. They were consulted as healers and had different marriage and funeral practices. Limited animism is reflected in their idea that stones have power. Sorcery was considered by the Indians as a thing of great power.

Reflecting the temperate climate, men went naked and women wore Spanish moss or deerskin. Cane was used to pierce male ears, nipples and lower lips.

Mourning for the dead placed an additional stress on the band. In a house where a son or brother died, no one of that house left it for a month, being provided for by others in the band. Several deaths in a small band could bring real hardship.

Trade was carried on by de Vaca between the coast and areas to the north (possibly as far as Oklahoma). Being a "neutral," de Vaca had greater access to the interior. From the coast he took sea snails, conch shells, sea beads and mesquite beans. These items were traded for skins, red ochre, hard canes for arrows, flint, sinews, tassels of deer hair and some form of adhesive.

As Cabeza de Vaca made his way slowly toward Mexico as he looked for Spanish colonies, he camped with and observed the Indians of the South Texas coast. The environment of the South Texas coast was more arid than the upper coastal regions. Vast plains, rivers, and mesquite trees yielded marginal resources. Camp was moved every two or three days in a continuous food quest. The summer prickly pear tuna season was possibly the only time aggregation occurred. Deer hunting was a group activity. Fires were used to drive lizards and small animals to the kill as well as keeping mosquitoes away from the camp.

The environment of South Texas was an ecological zone similar to the desert region of the Great Basin in Nevada. Indians utilized almost everything that walked, crawled, flew or grew

to sustain their existence. Crabs, shellfish, blackberries, roots, occasional antelope, spiders, eggs, larva, worms, lizards, snakes, earth, deer dung, pulverized bones of animals, and an occasional buffalo were mentioned as food sources by de Vaca. Liquor was made from cactus. De Vaca observed that the Indians living on this diet appeared to be physically fit, with men being able to run all day without stopping. During periods of extreme want, however, stomachs were often swollen from eating dirt.

Their technological achievements were adequate but basically primitive. Bows and arrows were used along with fish nets. Buffalo hides were used for blankets, shoes and shields. Houses were made of matting placed on hoops that could be rolled and transported. Rather than haul stones and pestles for grinding, sticks were pounded into holes in the ground.

Population pressure brought on by the marginal resources of the region resulted in fixed territories for the different bands and warfare to protect those territories.

Extreme social customs also reflect the marginality of their existence and the need for population control. In some bands, daughters were killed at birth and wives were purchased from outside the band. Prices were in terms of bows and arrows or nets. Male babies were sometimes killed and sons purchased. These practices were justified as being needed to keep down the enemy population as the killing of daughters reduced the number of brides available to the enemy bands. This reflects the practice of exogamy.

In contrast to the generous nature of the Indians of the upper Texas coast, de Vaca describes the South Texas Indians as thieves, liars and drunkards. He goes on to say that, in spite of their hardships and hunger, they were a merry people and never missed a chance for a fiesta (Covey 1983:80).

Throughout the Texas region, narcotics from the peyote cactus were used and imported from the South. For a purge, Indians used the black drink made from holly (yaupon, *Ilex vomitoria*). Women were taboo during menses and during certain festivals or ceremonies. Eunuchs dressed like women but used the bow and carried heavy loads.

From de Vaca's records, archeologists can formulate questions about the Contact period to substantiate his observations, increase our knowledge, test our theories, and corroborate our concept of the behavior of our coastal Indians. It is not the behavior of one Indian that is being studied, but the repeated behavior of the majority.

The issue of cannibalism

Of all of the historic Indians, "The Karankawa are among the most maligned Indian groups of Texas."(Hester 1980:48). There is no archeological evidence that the Karankawa who lived along the upper Texas coast were cannibals. "It was the Karankawa who were shocked by the sight of the starving Spaniards of the Navarez expedition eating the dead of their own party" (Hester 1980:50; Covey 1983:60). "W.W. Newcomb (1961:78) has succinctly summarized the distorted image of the Karankawa: 'Some of the atrocities attributed to these Indians are undoubtedly rationalizations growing out of the inhuman, unfair treatment the Spaniards and Texans accorded them. It is much easier to slaughter men and appropriate their land if you can convince yourself that they are despicable, inferior, barely human creatures.' "(Hester 1980:51). It is possible that the Spaniards may have intentionally spread the rumor of Indian cannibalism to scare foreign competition away from the Texas coast.

History is frequently a biased record. Historical information and scientific archeology, when used together, can provide the opportunity to come closer to the truth about our past.

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The Fullen Site

Michael J. O'Brien

The Fullen Site, 41HR82, was a small shell midden located on the east bank of Armand Bayou, approximately two miles north of the confluence of the bayou and Clear Lake. Between 1969 and 1971, portions of the site were excavated by faculty and students at Rice University with the assistance of members of the Houston Archeological Society. Prior to the late 1960s, few serious attempts had been made to understand the complex nature of the shell mounds that dot the southeastern Texas coast. Traditionally, shell middens were excavated in arbitrary levels because of the difficulty in distinguishing natural layers. Our work, especially that conducted in the fall of 1970, was designed to aid understanding the microstratigraphic nature of a shell midden through careful excavation and artifact recovery.

Our work probably set a record for slowness. Over the course of several months, only 14 m^2 of archaeological deposit were excavated (Figure 1, areas A and C). Eleven 1-m^2 units were placed in the shell midden, and three were placed just east of the midden. Other units had been opened in 1969, but these were excavated in 6-inch vertical levels and did not yield the detailed information we wanted. Units in areas A and C were excavated shell by shell across the areas, so that we could distinguish separate events in the buildup of the site. As Frank Hole (1974:7) notes, we attempted to let the artifacts tell us where the levels were. Thin layers were peeled off across the surfaces of contiguous squares, and when pottery and bone fragments were found, they were left in place until the entire area was uncovered to that level.

The depositional history of the site was, as expected, complex. Because of the extreme care with which the site was excavated, we were able to isolate distinct lenses of shell, bone, and pottery that reflected different depositional episodes. We also were able to pinpoint the interface between ceramic-bearing and aceramic strata and to trace these across the excavated areas (O'Brien 1974). Ceramic and stone artifacts recovered from the units are typical of those found at other sites in the region. The predominant ceramic type is the sand-tempered Goose Creek Plain, with smaller amounts of Goose Creek Incised, San Jacinto Plain, and Tchefuncte also present. Hafted-biface forms include what typically are called Scallorn, Perdiz, Bulverde, and Gary points.

Faunal remains are dominated by oyster and clam shells, but also include significant numbers of bones of white-tail deer, gray squirrel, opossum, and various species of turtle, fish, and waterfowl. Analysis of the molluscan remains produced several interesting results. For example, through careful measurements of the shells, Bonnie Hole (1974) was able to demonstrate a marked decline in size and age of harvested clams through time. Does this indicate a change in physical environment or perhaps the depletion of larger and older clams through time? More data are needed to answer these questions, but without the painstaking manner in which the site was excavated, such tantalizing questions could not be formed.

If we learned anything from our excavation and analysis of the Fullen Site, it is that conventional archaeological methods cannot be used to understand the depositional history of shell middens. None of us involved in the analysis of the Fullen Site would ever suggest that the small area opened in 1970 and 1971 allowed us to understand completely what transpired in that small locale along Armand Bayou during the course of several millennia. We would suggest, however, that we have a much better idea of the activities that took place there than if we had excavated a much larger area using arbitrary levels. Additional excavations in the region could build on this work and push both the methods used and the results gained ahead to the point where we can begin to feel as if we really have control over the nature of the ubiquitous features we call shell middens.

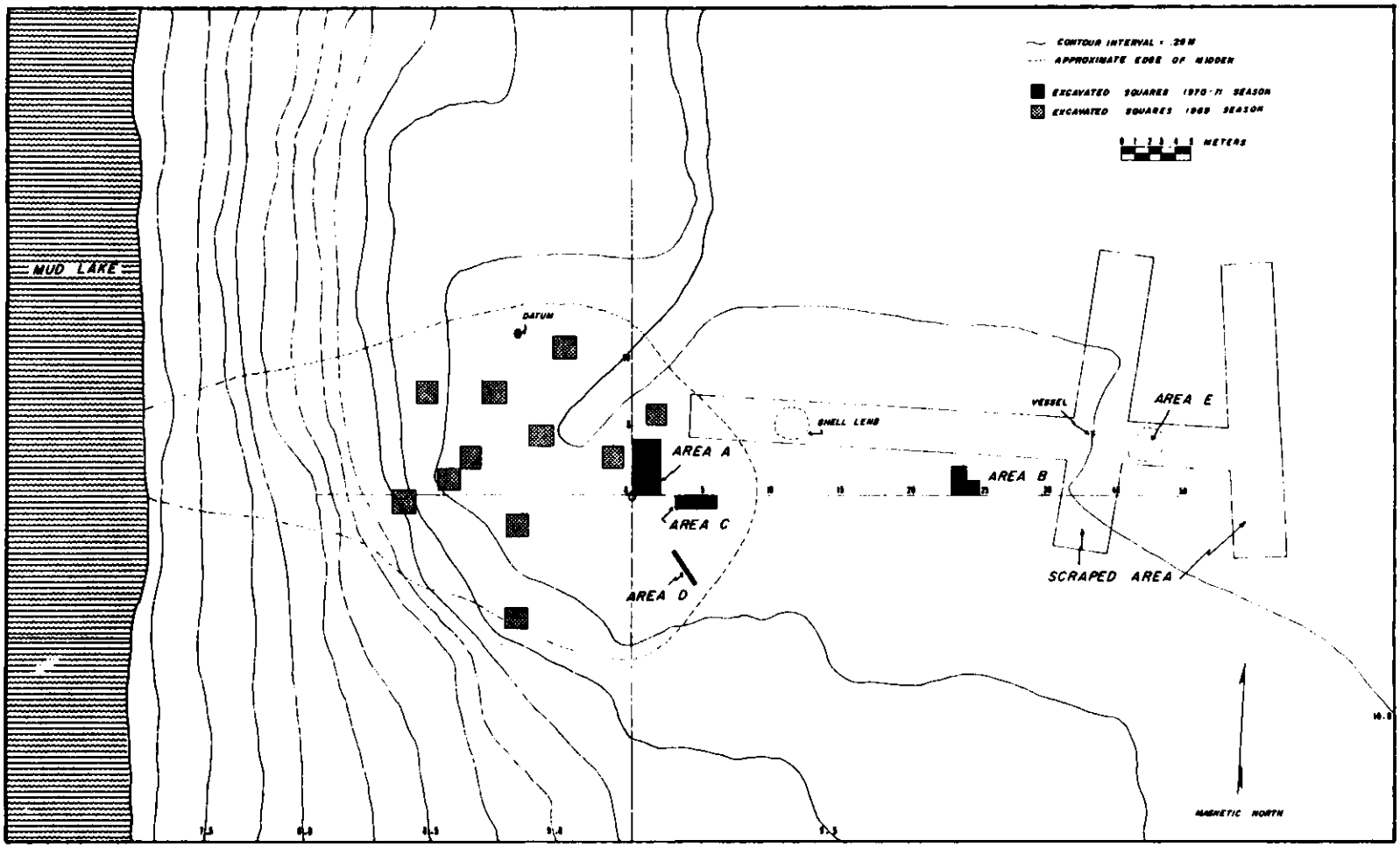

Figure 1. Plan of the Fullen Site showing locations of excavation units and scraped area

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Recent Developments in Southeast Texas Archeology

Blaine Ensor and Harold Drollinger

Recent surveys and excavations in Harris and Fort Bend Counties by Texas A & M archeologists have provided tantalizing data concerning prehistoric lifeways for Southeast Texas (Figure 1). To illustrate recent developments in the archeology of this area, a series of excavations conducted by personnel from the Archeological Research Laboratory, Texas A & M University, are briefly summarized.

Numerous natural sand mounds exist in Southeast Texas and often contain archeological sites. The Indians liked to camp on the mounds located very close to water due to their slightly higher elevation and sandy, well-drained soils. The Cinco Ranch mound sites are located in extreme eastern Fort Bend County on Buffalo Bayou. They were excavated in the summer of 1985. The Langham Creek Mound Site (41HR530) is located on Langham Creek, just inside the northern boundaries of Addicks Reservoir. It was excavated in the summer of 1987. These mounds are usually comprised of sandy loam A and E horizons underlain by a clay loam Bt (Bt-Bt2) horizon (Figure 2). Artifacts found in the mounds reflect a relatively simple lifestyle based upon hunting, fishing, and collecting or gathering. Numerous wild food sources were probably utilized, including deer, rabbit, bison, turtles, fish, and a host of native plants such as nuts from deciduous trees, tubers, and berries. The size of the groups which occupied these mounds seems to have varied, but, in general, no more than a large family or small band (less than 25 persons) occupied any one mound at a given time.

At the Langham Creek mound, virtually the whole "core" area of the mound, approximately 6 by 6 meters, was excavated. Although no intact cooking areas such as hearths were unearthed, two concentrations of ceramic sherds were found. These and an occasional burned clay fragment attest to the cooking activities carried out. Three groups of lithic implements and debris from tool use/resharpening, which indicate stonework, were found. Data suggest that the site was occupied for a short period of time, probably from about A.D. 800 to about A.D. 1200, by a family group. The lack of evidence for a dwelling indicates that, if one was present, it was lightly constructed, and left virtually no trace in the archeological record.

Another interesting site recently excavated is 41HR541 on White Oak Bayou in Houston. Excavations at this site took place in September 1987. This site revealed the remains of a single bison (buffalo) which had been killed and butchered by aborigines some time after A.D. 1200. Small arrow points, including the Perdiz type, Goose Creek ceramics, and lithic debris were found closely associated with the skeleton (Figure 3). The time period represented at the site, referred to as the Late Ceramic period in Southeast Texas, coincides well with other bison "kill" sites in the region. During this time, the Indians evidently relied on the bison for a portion of their diet. This contrasts with earlier cultural groups during the Early Ceramic period (A.D. 100 to A.D. 600), as noted from the Alabonson Road Site where deer is predominate.

The Alabonson Road Site (41HR273) is also located along White Oak Bayou in northwest Houston and was excavated during the fall of 1987 and early winter of 1988. It is characterized by a rich Early Ceramic period midden and a light, superimposed Late Ceramic period component. Artifact density is very high and preservation is very good; this made possible excellent recovery of data concerning the dietary aspects of the inhabitants. Artifacts collected include Goose Creek Plain, Incised, and Cord Impressed, and San Jacinto pottery; Alba, Darl, Gary, Kent, Perdiz, Plainview, San Patrice, and Yarbrough projectile points; botanical remains of palmetto, oak, pecan, hackberry, pine, elm, ash, bald cypress, willow, sweet gum, sedge, dogwood, and black walnut or butternut; and substantial faunal material, with deer and turtle the most common. Fractures in certain long bones of deer indicate that marrow may have served as part of the diet as well. Other

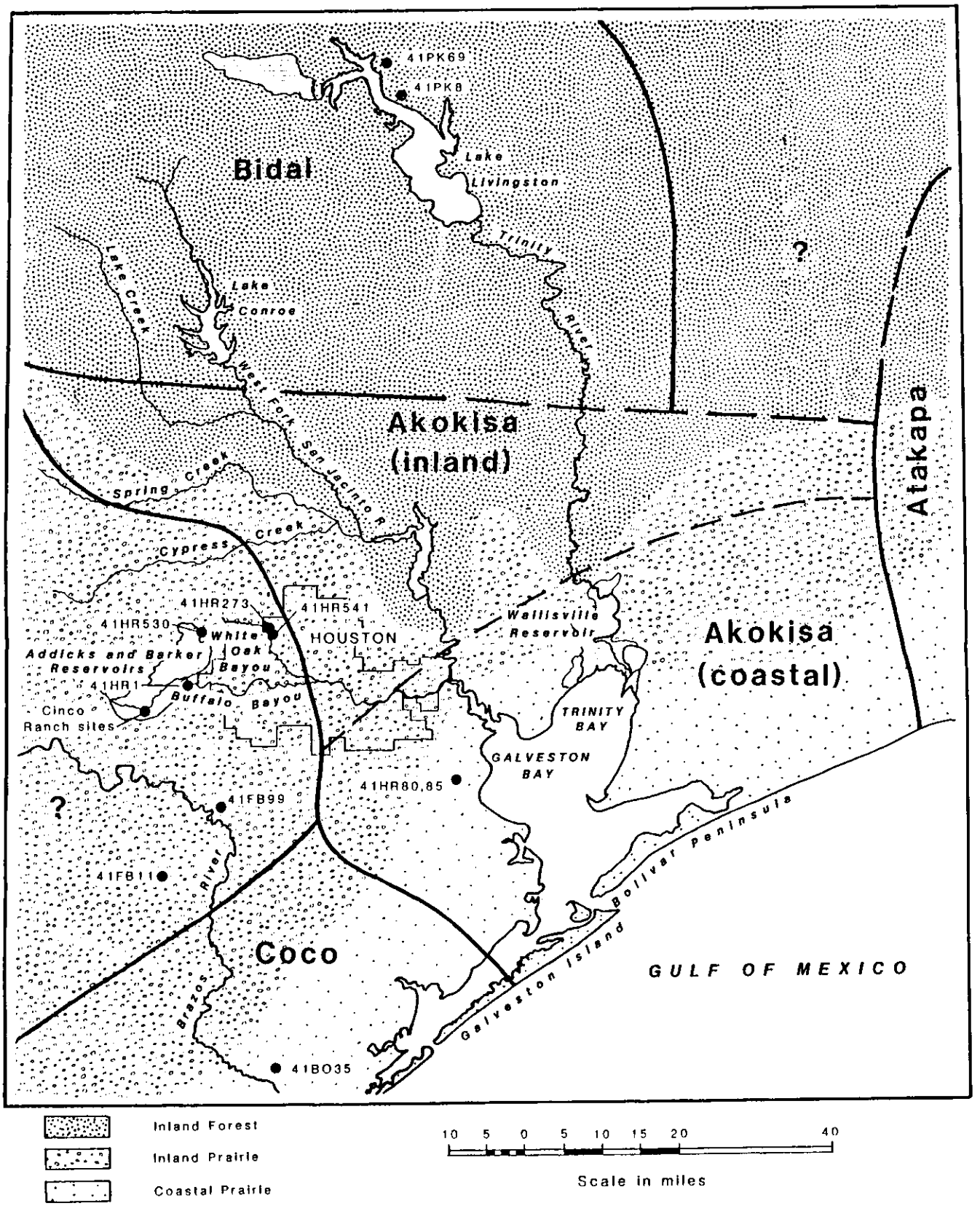

Figure 1. Research area and site locations

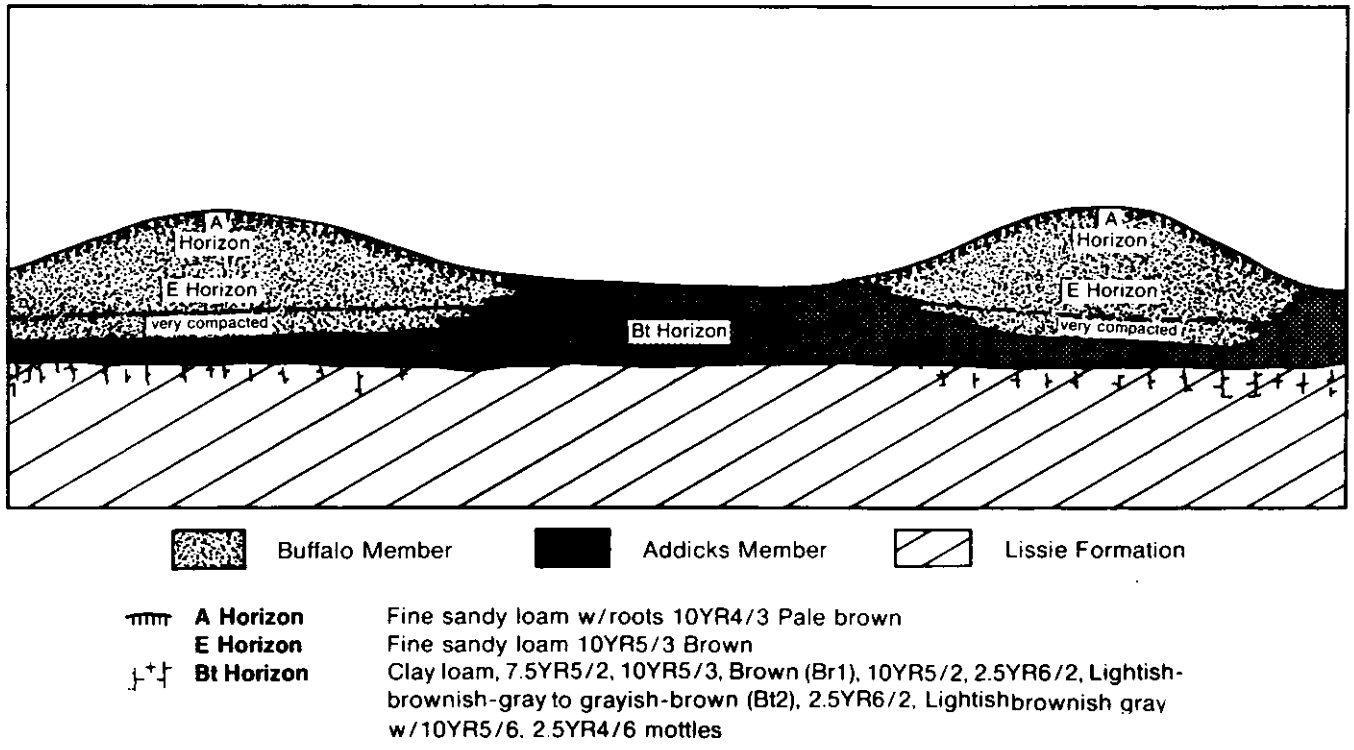

Figure 2. Schematic of sand mounds at Cinco Ranch

fauna include gar, snake, duck, antelope, ringtail cat, opossum, mole, gopher, beaver, rabbit, mink, raccoon, and coyote. Freshwater and marine shell are also present. Asphaltum, a sticky, tar-like substance, was detected on some of the projectile points, particularly the Perdiz type, which indicates hafting.

Artifacts of special interest were two copper beads, decorated bone, hematite or red ocher, and a possible Gahagan biface. The beads and biface may signify trade activities or association with cultures either to the east or northeast. The beads are flat pieces of copper that have been formed into a circle less than a centimeter in diameter, and are reminiscent of the Eastern Woodlands cold-hammer copper industry. The most likely sources of copper are areas near the Great Lakes and portions of the southeastern United States. The Gahagan biface is common in the Caddo region of eastern Texas.

Cultural features encountered at the site include two inhumations, six hearths, and three ceramic concentrations. Both burials were female, between the ages of 22 and 30. One had a concentration of shell near the midsection, possibly indicating a necklace being worn at the time of interment. The hearths occurred around the same elevation just below the surface at or very near the interval between the Early and Late Ceramic episodes. The site appears to have been inhabited regularly, perhaps on a seasonal basis, but more intensely toward the later occupations of the Early Ceramic period.

These excavations have stimulated interest and presented as many questions as answers in the archeology of Southeast Texas. Studies of these sites and their distributions help to unravel many of the uncertainties regarding prehistoric lifeways for this region. Eventually, it is hoped these investigations and future ones will lead to a more thorough understanding of the people who occupied this area of Texas.

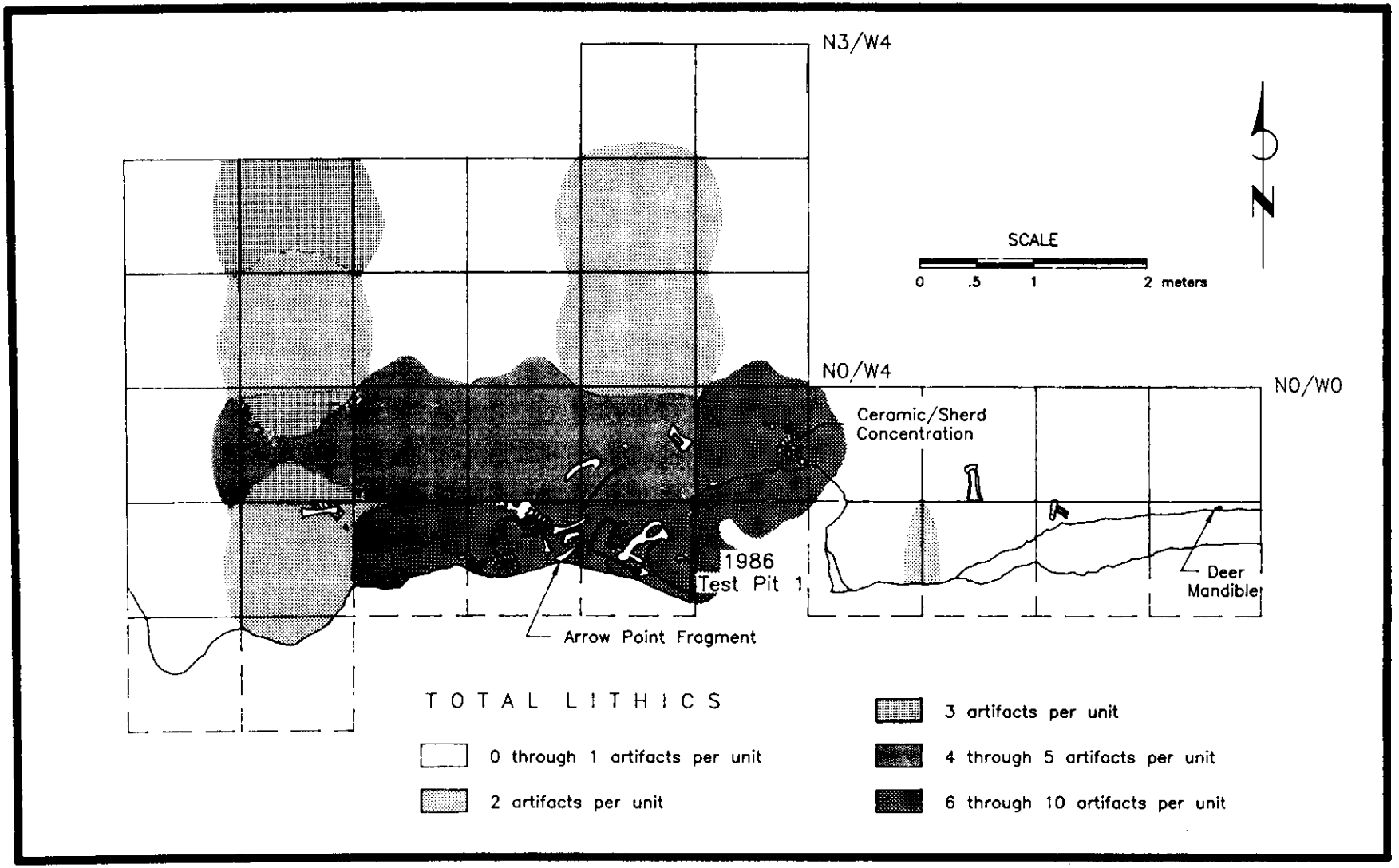

Figure 3. Density distribution of lithics with bison remnants at 41HR541

The Lower Trinity River and Environs

J. Richard Ambler

Wallisville Reservoir

The Wallisville Dam, with an elevation of 4 feet above sea level, will soon be covered by water and therefore obsolete. Sea level is predicted to rise at a rate faster than any time since the Altithermal, 5 to 8 feet in the next 50 years because of increased glacial melt. Man-caused atmospheric pollution is already resulting in a greenhouse effect on the world's climate. The next 10 years may be the last decade to excavate many sites along the coasts without resorting to underwater archaeology.

In a sense, the 1966 salvage excavations by the University of Texas in the Wallisville Reservoir area were underwater archaeology (Ambler 1970). Although the basal portions of the middens were well below modern sea level, it was possible to excavate the initial backhoe trenches deep enough that the entire midden could be pumped dry each morning, since the surrounding clays were relatively impervious. The middens investigated at Wallisville were first deposited in preceramic times, about 200 B.C. The upper third of the middens saw the introduction of Tchefuncte-like pottery, called Lost River Plain, about 100 A.D. Wallisville Plain, a companion type, has relationships to the north.

Most subsistence was on *Rangia* clams, but by A.D. 600 the nearby bayous had become too silted in for *Rangia*, so these sites were abandoned. Deer and estuarine vertebrate bones became more common through time, because of environmental changes due to continuing deposition. Site location was moved frequently as clam beds became temporarily exhausted, resulting in large numbers of middens, although the total population was low. A group of 25 people spending only a few weeks of the year at each of 10 or 20 sites seems reasonable. The delta is inhospitable during the winter because of flooding, so may have only been utilized during the dry season. Most of the prehistoric sites in the Wallisville area appear to have been contemporaneous (Ambler 1970). Contemporary upland sites, being without clams, have not been identified. The necessary mobility of the low population and lack of local resources resulted in very few artifacts being found, even with the burials, so the artifactual inventory of the Lost River Phase and preceding Archaic were poorly defined.

Twenty-six radiocarbon dates were obtained, almost half from *Rangia* shell. In contrast to most shellfish, *Rangia* date only 200 to 300 years earlier than the associated charcoal, so can be used for dating in the absence of charcoal. Environmentally the lower Trinity River is akin to places eastward along the Gulf Coast, so it is not surprising that cultural relationships were and still are to the east rather than westward along the coast or with the Texas interior.

Cedar Bayou

In the mid 1960s U. S. Steel announced plans to build a plate mill near Cedar Bayou east of Houston. The State Building Commission was able to supply the University of Texas with enough emergency funds for 40 person-days of field work. Three sites were excavated (Ambler 1967). Each had some light pre-pottery Archaic occupation, but most of the occupation was apparently in the 1000 years preceding the Spanish. For much of that millennium, subsistence was based on oyster and *Rangia* with a period in the middle of heavy dependence on land vertebrates, especially deer. This temporary shift in subsistence patterns may have been related to the changes in vertebrate distribution caused by a hurricane.

Over 3000 sherds were recovered. The earliest pottery is sand tempered, with sherd-tempered ceramics becoming more common through time. Incising and noded bases were introduced prior to sherd tempering. Stone artifacts, as would be expected from the absence of raw resources, were scarce, and bone artifacts were plentiful, including socketed projectile points, awls, and blunt ulna tools.

Spanish

In the mid-1700s, the Spanish were upset by French incursions west of the Mississippi River and destroyed a French trading post on the east side of the lower Trinity River. By 1756, the Spanish had established a presidio and mission at the site of the destroyed trading post, moved it a decade later, and abandoned it in 1771. An accurate map had been drawn in 1767. Most of the hill upon which the presidio had last been placed had been removed for the construction of nearby Interstate 10 in the late 1950s, but enough majolica and glass beads remained to identify the hill as the location of the Presidio San Augustin de Ahumada. Since the remaining portion of the hill was planned to be used for additional borrow material, a cooperative emergency excavation involving the State Building Commission, the University of Texas, the National Park Service, and Chambers County was conducted in 1966 (Tunnel and Ambler 1967). The presidio building remnant had been totally removed during highway construction, but some light scattered trash remained to the east and southeast of where the buildings had originally stood. Much of this area had been dug in uncontrolled fashion by locals, one of whom kindly loaned his collection for study. The Texas Archeological Salvage Project excavated 31 test pits. Most artifacts of European genesis were sherds: 295 Spanish majolica, 259 French faience, 33 salt-glazed stoneware, 25 unidentified European earthernware, and 6 oriental rice bowl sherds. Forty-nine glass sherds were found, as were 4351 glass beads. A few copper and iron objects were also found. The large number of glass beads indicates missionizing activity among the local Akokisa Indians. That this activity was at least partially successful was shown by the finding of 438 sherds of Indian ceramics, indicating that some Akokisa were living at the presidio. The presence of large amounts of French pottery shows that Spanish-French trade was occurring, even though the two countries were technically at war in this area.

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Archeology in the San Jacinto River Basin: A Look Back After 20 Years

Harry J. Shafer

Introduction

A monograph entitled "Archeological Investigations in the San Jacinto River Basin, Montgomery County, Texas" was published in 1968 by the then Texas Archeological Salvage Project, The University of Texas at Austin (Shafer 1968). This monograph reported the results of test excavations at three sites in the Conroe Reservoir basin. The field work was a reservoir salvage effort conducted as a part of a Memorandum of Agreement (MOA) between The University of Texas and the National Park Service. Two additional sites were investigated beyond the MOA; these were 41MQ14 tested by the Houston Archeological Society (unpublished) and the Scotts Ridge Site 41MQ41 tested by Texas A&M University (Shafer and Stearns 1975).

This paper reviews the archeological investigations that were conducted in the Lake Conroe basin and presents some reflections on the nature of the work and the interpretations of the findings.

Past archeological work

In 1965 the inland area of Southeast Texas was largely unknown archeologically (Suhm etal. 1954:Figures 4 and 5; Shafer 1968); indeed, this could be said with all of Southeast Texas at that time. An opportunity to gain some insight into the prehistory of the region came with the salvage archeology program at Conroe Reservoir. An archeological survey of the basin was conducted in 1965 by William Sorrow and myself (Shafer 1966). This survey was not systematic by today's standards, and was constrained by two factors: time and access. The areas that we did survey were thoroughly covered on foot using both surface inspection and shovel testing to verify the presence or absence of cultural materials.

Approximately one-third of the reservoir area was covered and 34 prehistoric archeological sites were documented during this survey; no effort was made to document historic structures or sites. Fourteen sites were recommended for additional investigations. The criteria for recommendation were based on the superficial appearance of the site, depth of the deposits, and time periods represented in the materials collected from the surface.

Daymond Crawford and I returned to the Conroe basin in 1966 for two months of test excavations. We worked with local labor and partially excavated three sites, 41MQ4, 41MQ5, and 41MQ6. The research design was simple and straightforward. Ostensibly, our goal was to recover a representative sample of the archeological data affected by the reservoir. This goal could hardly be met by sampling only 3% of the estimated archeological resources.

Our excavations were mainly stratigraphic and block tests conducted to document vertical and horizontal differences in the material remains. We were successful in gaining information to construct a framework of culture history, data on site structure, and on site locations. However, in terms of modern archeological goals, our work provided little information on the ways of life of the people or on the processes of culture change. The New Archeology revolution had just begun and the smoke had yet to drift into Texas.

The sites

A brief synopsis of the findings at four of the sites is presented. Data on 41MQ14 is unpublished and was not available for this overview. The findings at that site generally parallel those at 41MQ5.

41MQ4

Site 41MQ4 was located on the south side of Adkins Creek on a low bluff about one mile upstream from the creek's confluence with the West Fork of the San Jacinto River. Cultural material was found in a dark brown sand overlying a basal clay formation. Structural features were found in the sand, including hearths and burned clay ball concentrations. The cultural remains were mostly lithic and ceramic artifacts. The site was occupied during the Late Archaic/Woodland period; this is a time when ceramics were first introduced into the area. The ceramics were plain coarse sandy paste (or sand-tempered) wares consisting of simple bowls and jars (cf. Goose Creek Plain of Aten 1983:231,232). The pottery was associated with contracting-stem Gary and possibly parallel-stem Kent projectile point types. Expanding-stem Palmillas points were concentrated in the deeper levels below the pottery.

41MQ5

This site was located on a low terrace west of the San Jacinto River about one mile above the dam. Cultural materials were prolific in the sandy fill overlying a basal clay formation. The sand varied in thickness from about 10 inches to over three feet. Here again, the material evidence consisted mostly of lithics and ceramics. No structural features were found at the site. The time span of the occupation was longer than for 41MQ4 and the deeper deposits yielded some vertical trends in the cultural sequence. Arrow points generally occurred in the upper levels along with the bone-tempered and grog-tempered ceramics; Gary points clustered below the arrow points and were associated with mostly sand-tempered pottery. Kent points were clustered deeper where the pottery was almost exclusively sand tempered.

41MQ6

This large site was located on the Weirs Creek drainage approximately five miles west-northwest of Willis, Texas. The site extended along a sandy ridge paralleling the creek. Three areas of the site were tested. As with the other sites, the cultural materials were recovered from deep sand deposits. Structural features were found in each of the areas and include a circular dark brown midden lens in Area A which may have been a house floor. A large sandy paste jar (cf. Goose Creek Plain) was associated with this feature. Hearths and burned clay ball concentrations were the other features.

The cultural sequence of 41MQ6 included the same types of earlier materials as found at 41MQ4 and 41MQ5, but yielded the largest sample of arrow points and decorated pottery from any of the sites. The vertical distribution of the artifacts clearly shows that sandy paste pottery is early and extends throughout the sequence; bone-tempered and later grog-tempered pottery appear along with the arrow points. The bone-tempered and grog-tempered pottery probably represent cultural inspiration emanating from the Caddoan area of northeastern Texas.

Scotts Ridge Site (41MQ41)

The Scotts Ridge Site is located on a high ridge point overlooking Lake Conroe. The site was outside of the 1965 survey tract. Limited test excavations were conducted in the shallow sand deposit. The only sample of early Archaic diagnostics found in the Lake Conroe district came from the Scott Ridge Site; these artifacts include a site-notched dart point and a San Patrice dart point. The importance of the Scotts Ridge Site is that it demonstrated that earlier Archaic materials not found in the lower elevations of the valley occur at high points and ridges bordering the valley.

Summary

Archeological excavations at four sites in the San Jacinto River basin yielded sufficient data to propose a tentative cultural sequence for the locality. Findings at the Scotts Ridge Site indicate that early Archaic lithic materials can be found on the higher landforms bordering the major streams. These sites will tend to have thin soil mantles which probably will not appear to be promising from superficial inspection.

Archeological sites located on progressively lower landforms will yield progressively later materials. Site 41MQ4, for example, is on a terrace ridge above the Adkins Creek floodplain and yielded a pre-arrow-point Late Archaic/Woodland assemblage (Shafer 1975) components. Vertical distribution of the materials revealed that expanding-stem Palmillas points clustered lower than the parallel-stem Kent and contracting-stem Gary points. Plain, coarse sandy paste pottery clustered with the Gary and Kent points.

Site 41MQ5 was located lower in the valley than 41MQ4 but yielded much of the same pre-arrow-point material along with arrow points and bone-tempered and grog-tempered pottery. The vertical distribution of the artifacts indicates that bone-tempered and grog-tempered pottery are associated with the arrow points, but no strong temporal trends were seen within these tempering categories.

The vertical distribution of the arrow points and associated pottery was a bit clearer at 41MQ6, allowing for a tentative sequence to be proposed (Figure 1). Bone-tempered pottery appears earlier than grog-tempered pottery; there is also a hint that Catahoula points predate Perdiz points.

The pottery tradition is clearly dominated by sandy paste ware which Aten (1983:231-232) describes as Goose Creek Plain. These vessels are mostly deep conical bowls or jars. This pottery first appears in what Texas archeologists would normally call the Late Archaic/Woodland period. Aten (1983:293) dates this introduction at about A.D. 500, but I feel that it could easily be 300 to 400 years earlier based on the radiocarbon dates from Coral Snake Mound (Jensen 1969). The acceptable dates for the Woodland manifestation at Coral Snake Mound range from 120 B.C. to A.D. 400. The Woodland manifestation at that site is a burial mound containing cremations, Marksville Stamped pottery, copper and other exotic artifacts. The indigenous lithics and sandy paste (or sand-tempered) pottery are remarkably similar to those recovered from 41MQ4.

The early sandy paste pottery in the Lake Conroe district is associated with parallel-stem and contracting-stem dart points. The sandy paste pottery tradition is widespread throughout Southeast Texas and was probably derived from the Tchefuncte and Marksville developments of the Lower Mississippi Valley. It endured in Southeast Texas throughout the remaining prehistoric sequence. Small percentage of bone-tempered pottery, again mainly in the form of bowls and jars, appears in the sequence associated with parallel-stem arrow points. Bone-tempered pottery probably was introduced from the Caddoan area, as was grog-tempered ware which appeared somewhat later in the sequence. Both of these wares are often decorated with wet-paste techniques such as incising and punctating.

Atakapan-speaking Indians occupied the region of Southeast Texas in early Historic times. Using the direct historical approach and the assumption that a continuity of ceramic tradition indicates a general continuity of ethic identity back in time, several archeologists have suggested that the Galveston Bay pottery series and the largely unnamed inland sandy paste pottery series can be attributed to the Atakapan-speaking Indians (Shafer 1975; Aten 1983:313-325). The origin of the Southeast Texas pottery, although claimed by Ambler (1973:92) to be Caddoan, is more likely from the Lower Mississippi Valley Tchefuncte, Marksville, and Coles Creek traditions and may predate the Caddoan tradition by as much as 1000 years.

PROPOSED SEQUENCE
for the
LAKE CONROE DISTRICT

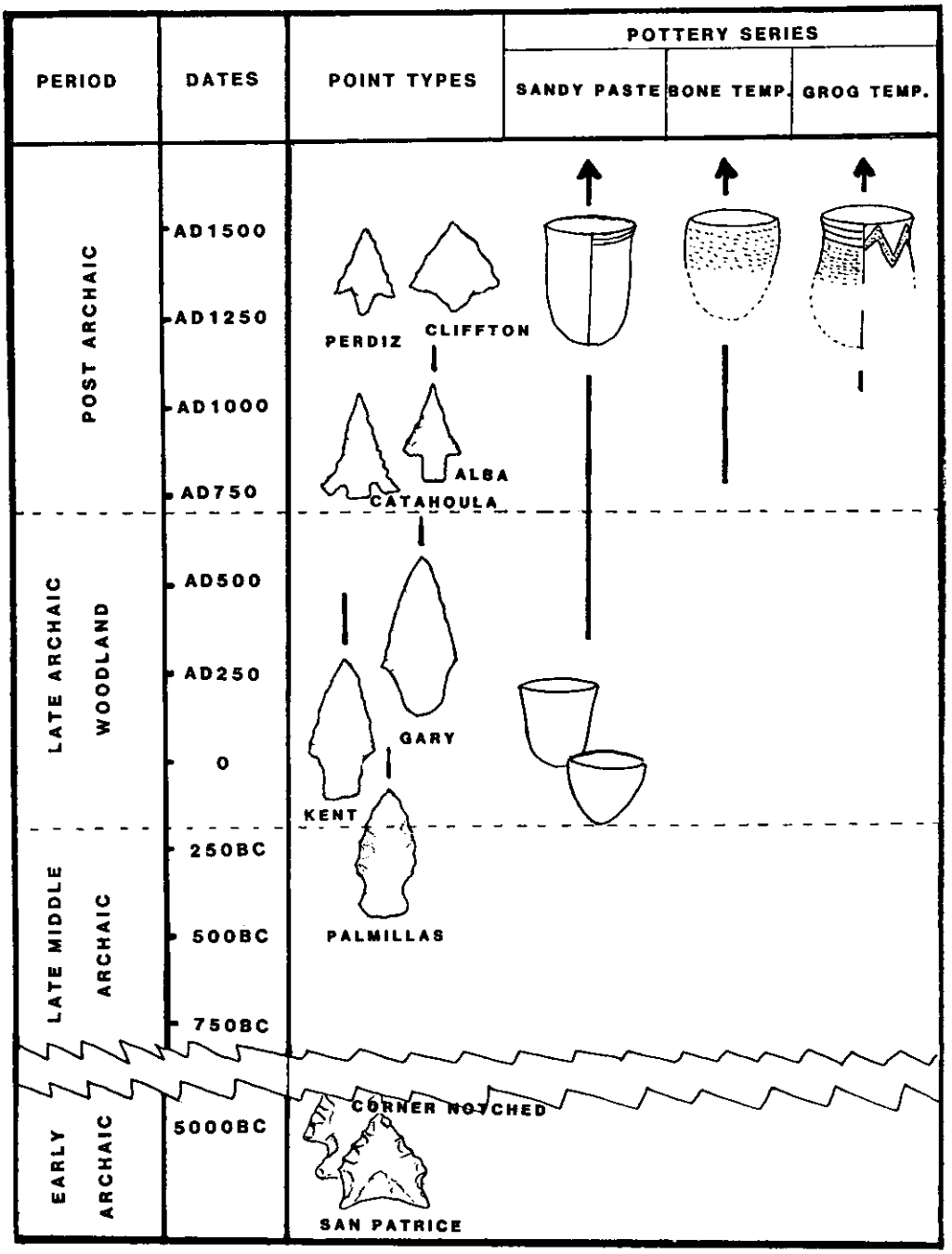

Figure 1. Proposed sequence for the Lake Conroe district

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Shell Point (41BZ2)

Frank Hole

The excavation of this little site was carried out by students at Rice University as a class project in field techniques, after the presence of burials eroding out of an exposed bank at the mouth of Chocolate Bayou had been reported to Frank Hole (Hole and Wilkinson 1973).

Only a small remnant of what probably had been a much larger site remained at the time of our excavation. Frank Mebane, a local resident, told us that the bank had eroded back 5 to 7 meters in the previous decade, and we found a site of only 12 by 20 meters. Our excavation was concentrated in the burial area next to the eroding bank.

Five bodies were packed tightly together in a shallow pit dug into an oyster shell midden in what probably was a single interment following a catastrophe. Other burials also occurred in the site, as is common with shell middens along the Gulf Coast; however, these were evidently single interments. We were given various bones representing such burials that had eroded from the bank in previous years, and the entire collection, representing nine individuals, was studied by Dr. Richard Wilkinson.

The skeletons are consistent with the historic Atakapan and Karankawa Indians who were reportedly tall and muscular. Some pathologies were noted, the most common being a progressive bone disease such as periostitis, probably resulting from infection. The five bodies in the common pit consisted of two males and a female greater than 40 years, a young adult male and a child of about 5 years.

It is probable that this group was fishing and collecting shellfish at Shell Point when a norther blew up unexpectedly, leaving them stranded, and they froze before they were able to reach shelter. Such episodes of severe northers are well attested historically and numerous people have died in similarly exposed positions.

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Prehistoric Occupation Sequences in Southeast Texas

Leland W. Patterson

Introduction

Southeast Texas has had human habitation for at least 12,000 years. The archeological record is not detailed for the Early Paleo-Indian period from 12,000 to 10,000 years ago, with only a few distinctive types of stone spear points, such as the Clovis type, to demonstrate that man was in this region at that time. After 10,000 years ago, the available archeological record becomes much more detailed. There are a number of sites in Southeast Texas that demonstrate occupation sequences of approximately 10,000 years, starting with the Late Paleo-Indian period and continuing through the Late Prehistoric until historic time at A.D. 1500 (Patterson 1983).

Many texts picture the Early Paleo-Indian as a hunter of large extinct types of animals, such as mammoth. In Southeast Texas, however, a single, broad-based hunter-gatherer lifestyle seems to have been followed by Indians for the entire prehistoric period. Animal bone remains are much the same in this region from early and late prehistoric sites, with the animals being a variety of modern species.

While the lifestyle of Indians in this region remained basically the same over time, there were technological changes that can be found by archeological studies. Styles of stone spear points changed gradually over time. Pottery was introduced to this region about A.D. 100. Standardized styles of arrow points start at approximately A.D. 600, although use of the bow and arrow started somewhat earlier with non-standardized point styles. Two archeological sites that have been excavated by the Houston Archeological Society show the long occupation sequence of prehistoric Indians in this region. One of these sites is 41HR315 in Harris County (Patterson 1980), and the other is site 41WH19 in Wharton County (Patterson et al. 1987).

Site 41HR315

Archeological site 41HR315 was located on Cypress Creek in northwest Harris County, but has been completely removed by road construction. Before disturbance of this site, the Houston Archeological Society conducted a large-scale excavation, and found an occupation sequence of about 10,000 years. In the older (deeper) excavation levels, cultural remains consisted of spear point types such as San Patrice, Plainview, Angostura, and Early Stemmed (Figure 1), and other stone tools made on chert flakes. Spear point types from later periods included Carrollton, Bulverde-like, Kent and Gary. A few Perdiz arrow points were found from the younger (upper) excavation levels.

Hearth features made of baked clayballs, which represent cooking activities, were found at several excavation levels. Types of animal bone, such as deer and turtle, were similar at all excavation levels. Much stone debris was found at this site, which demonstrates a high level of stone tool manufacturing activity. Chert does not occur naturally near this site, and appears to have been imported from a distance of at least 25 miles, perhaps from the Brazos River area. As would be expected, pottery occurs in the upper excavation levels of this site. This was the first site excavated in Southeast Texas where an entire occupation sequence of about 10,000 years could be shown. The age of each excavation level was estimated from point types that have been dated in other regions of Texas, and from the start of pottery that has been dated for the upper Texas coast (Aten 1983).

Site 41WH19

Another site with a long prehistoric occupation sequence, 41WH19 in Wharton County, was excavated by the Houston Archeological Society. A radiocarbon date of 7970±530 B.C. was obtained for the deepest excavation level, and a radiocarbon date of A.D. 1585±80 was obtained for the youngest excavation level. Cultural remains for each time period were similar to those found at site 41HR315 in Harris County, including the types of projectile points, pottery, baked clayball hearths and much debris from stone tool manufacture.

It was demonstrated for the first time at site 41WH19 that certain types of notched-base spear points occur very early in this region, in the Late Paleo-Indian period from 10,000 to 7,000 years ago. In addition, a notched-base point was found at about the same level as a Folsom fluted point, which usually represents a time period of 11,000 to 10,000 years ago. Thus, occupations at this site may have started before 10,000 years ago.

Animal bone preservation at site 41WH19 was good enough to allow a detailed analysis. Deer, turtle and rodents were principle food sources. Bison remains were present at only some excavation levels, so bison was probably not continuously available over time. While plant foods were probably also important in prehistoric diets, there is generally no preservation of plant remains at archeological sites in this region.

General comments

There are a large number of recorded surface collections from prehistoric sites in Southeast Texas. When data from both surface collections and excavated sites are used together, a fairly good picture of prehistoric occupation sequences and lifestyles can be obtained. The Houston Archeological Society has a continuing program of field research in Southeast Texas to increase knowledge of man's past in this region.

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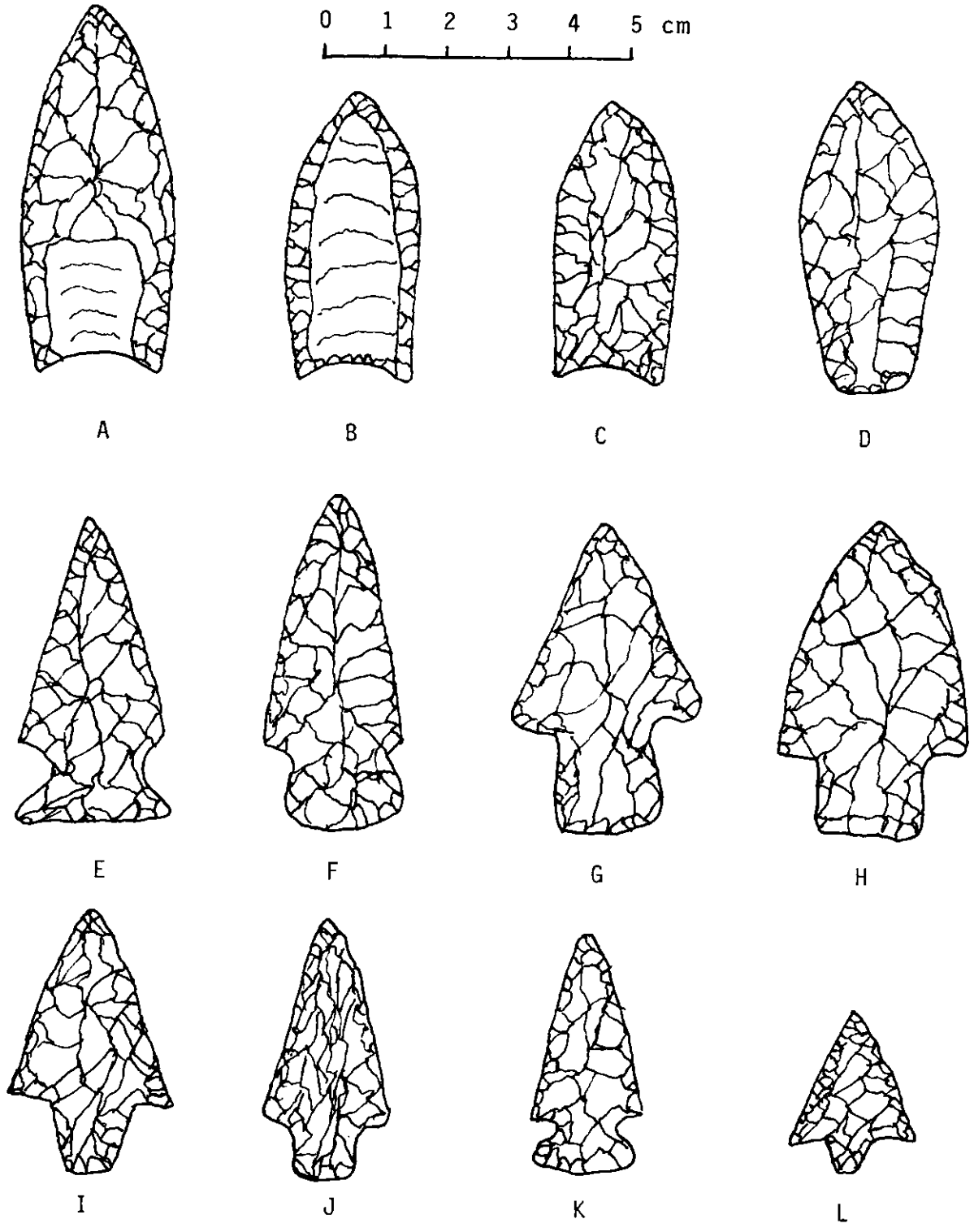

A-Clovis, B-Folsom, C-Plainview, D-Angostura,
E,F-Early Notched, G-Carrollton, H-Bulverde, I-Gary,
J-Kent, K-Ensor, L-Perdiz

Figure 1. Projectile point types

Evaluation of Prehistoric Site Preservation on the Outer Shelf: The Sabine River Area, Offshore Texas

Charles E. Pearson

Introduction

For the past decade there has been an increasing interest among archaeologists in the prehistoric archaeological potential of the continental shelves of the world. Prior to about 10,000 years ago, because of lower sea levels, vast areas of the North American continental shelf were exposed, providing land and resources to aboriginal populations. There is no doubt that these populations used and settled these areas. Today, many would agree that, given certain conditions, prehistoric sites established on the continental shelf during those periods of lowered sea level would have withstood the effects of rising seas and would now remain preserved on the submerged portions of the shelf. One of the settings that could provide the set of conditions leading to site preservation of the continental shelf is a filled stream valley. This is particularly true of the larger valleys which, with sea level rise, develop into estuaries and slowly fill with sediments before being completely inundated. Archaeological deposits can become covered by and encapsulated in estuarine sediments and remain intact beneath the erosive impacts of rising seas. Developing statements concerning the potential occurrence and distribution of archaeological deposits in these offshore settings requires, first, the projection of a culture history for the area with its attendant settlement patterns probably best drawn from onshore analogies, second, an assessment of the geological and ecological history of the area, and, third, the identification of the geomorphic processes which affect archaeological site preservation.

To date, several studies relying on these types of data have produced what appear to be reasonable models of site occurrence and preservation in large stream valleys on the North American continental shelf (Belknap and Kraft 1981; Coastal Environments, Inc. 1977; Kraft et al. 1983; Masters and Fleming 1983). Testing these models, however, is another and more complicated problem. It requires a technology that permits the identification of submerged and buried landforms which have a high likelihood of containing cultural remains and it also requires a method for collecting samples from these landforms. In essence, it demands a practical geological/geophysical approach to an archaeological problem. Fortunately, this technology is today available in the form of a variety of instruments that enable refined mapping of the shallow subsurface geology of the continental shelf, and in a range of coring devices which can collect a physical sample suitable for analysis from a submerged target landform.

Recently, Coastal Environments, Inc., undertook a study which had the specific objective of locating buried archaeological deposits in a filled stream valley setting in the Sabine-High Island area on the Outer Continental Shelf (OCS) of the Gulf of Mexico (Pearson et al. 1986). The project, sponsored by the Minerals Management Service of the Department of the Interior, was designed as a test of a model of site occurrence and preservation developed in an earlier study of the cultural resources potential of the OCS (Coastal Environments, Inc. 1977). In addition, the study provided an opportunity to evaluate the usefulness of various technologies in this type of research. The project was conducted in two phases. The first phase involved the synthesis and evaluation of previously collected archaeological, geological, seismic, and bore hole data from the study area. The second phase of the study involved the field collection of additional seismic data and the taking of core samples from several offshore target areas which had been identified as potential archaeological site locales.

The region selected for implementation of this study is a 35-mile-square area in the offshore

Sabine-High Island region of eastern Texas and western Louisiana (Figure 1). Submerged and buried in this area are the relict and filled channels of the late-Pleistocene-to-Holocene age Sabine River Valley. Prior to its inundation by rising seas about 7000 years ago, the Sabine River extended its course across this section of the continental shelf. Figure 1 depicts the estimated configuration of the filled river valley and also shows several areas ("lease blocks") which received intensive survey coverage during our study. This river system provided an ideal research universe for several reasons. One of these is that an abundance of published and unpublished data are available that provide information on the present setting and geological history of the offshore river system. Of particular importance is the published work of Henry Nelson and Ellis Bray (1970) that delineates the Pleistocene river system and the subsequent changes it underwent with sea level rise. In addition, an extensive body of seismic and borehole data, collected relative to oil industry activities, is available from the area, and the regional geology has been well studied (Aronow 1971; Aten 1983; Bernard 1950; Bernard and LeBlanc 1965; Bernard et al. 1962; Berryhill 1980; Curray 1960; Nelson 1968).

Other factors which make the offshore Sabine Valley conducive in the search for submerged sites are: 1) the river system was active and the region was subaerially exposed when prehistoric populations occupied the region; 2) the river system was active for at least 12,000 years, sufficient time to permit the accumulation of an extensive archaeological record; 3) relict features having a high probability for both site occurrence and preservation have been identified within the valley system; and, 4) these landforms are often not deeply buried and many are within the range of standard coring techniques.

Field techniques

During the course of the study, data from over 100 offshore lease block surveys, 23 pipeline rights-of-way surveys and 35 borings were examined. An extensive amount of additional seismic data was collected in eight lease blocks within the study area in an attempt to locate and accurately map landforms on which archaeological sites may occur. Added to this were 77 cores taken at five selected "high probability" locales. These were locales presumed most likely to contain preserved archaeological deposits as derived from a model of site-landform relationships and on presumptions about the degree of preservation of the landform. Sediment samples from the cores were analyzed in order to further refine the local geology and to test for the presence of cultural remains.

Seismic data were collected with an ORE Subbottom Profiler, commonly known as a pinger, operating at a frequency of 3.5 KHz. In most cases, the pinger provided high resolution records of the upper 40 feet or so of the sea floor. Once the seismic data were analyzed, the high probability locales were selected for coring. The coring device used is known as a "vibracore," an instrument with a vibrating boring tube which can extract continuous cores up to 40 feet in length.

Results

The analysis of all of the collected seismic and core data has provided information on the geological history of the study area and its archaeological potential. In most respects, our findings correspond closely to those developed earlier by Nelson and Bray relative to the configuration and age of the offshore Sabine River Valley. A major departure from Nelson and Bray is our identification of extensive areas of relict Deweyville floodplain within the offshore Sabine Valley. A distinguishing characteristic of Deweyville landforms is the presence of "giant" meander scars three to six times larger than modern channels (Bernard 1950; Gagliano and Thom 1967; Saucier 1974).

The Deweyville channels identified in our study area are 900 to 1000 feet across, comparable in size to relict Deweyville channels seen today along the on-shore Sabine River. It is recognized that Deweyville channels reflect much higher discharges than at present; however, there is disagreement over the nature and conditions responsible for the increased discharge as well as the age of the Deweyville features (Alford and Holmes 1985). Radiocarbon assays on wood from relict Deweyville channels onshore indicate an age ranging from 17,000 to greater than 30,000 years B.P. (Bernard and LeBlanc 1965). Some, however, (Alford and Holmes 1985; Gagliano and Thom 1967) argue that the conditions responsible for Deweyville alluviation continued up to 6000 or 7000 years ago. A lack of radiocarbon dates has been one of the reasons behind the controversy over the dating of the Deweyville. Fortunately, within our study area we were able to obtain several radiocarbon dates from swamp deposits capping Deweyville channel features. The earliest of these is 10,145 years B.P., indicating that Deweyville channels in the study area are somewhat older than that date. Critical to the present study is the fact that early human occupation on this section of the continental shelf was very likely associated with Deweyville landforms. The climatic conditions producing the giant streams and the environmental setting of the Sabine River Valley during Deweyville times must have been quite different from those of today. How the region's early hunters adapted to this environment is not yet entirely understood.

The identified Deweyville surfaces in the study area fringe both sides of the Sabine Valley and exist as a topographically level surface 10 to 15 feet lower than the older Pleistocene Prairie/Beaumont surface. These fringing Deweyville surfaces can be followed for a distance of about 30 miles down the offshore Sabine Valley, but beyond that point we have only minimal data and are unsure of their presence.

The interior portions of the offshore Sabine Valley, identified as Holocene (modern) floodplain, were only minimally examined during the study. This is because all of this area appeared on seismic records as a flat to very uneven biogenic gas front which absorbed and attenuated the seismic signal, obscuring any underlying floodplain features. Vibracores that penetrated this gas front indicate that it marks the presence of extensive swamp and marsh/estuarine organic deposits laid down before this area was inundated by rising seas. Floodplain landforms such as levees and relict channels certainly exist beneath this gas front but they could not be identified in seismic records.

During the period between 6000 to 25,000 B.P. the Sabine River in the study area was a complex and dynamic riverine and, subsequently with sea level rise, a coastal estuarine ecosystem. We must assume that at any one time the area within the boundaries of the offshore Sabine Valley exhibited the range and variety of natural settings found in present-day riverine and estuarine settings. The on-shore Sabine River Valley served as an analog with which to model the settings of the study area prior to marine inundation. As expected, close correlation was seen in the configuration and distribution of many of the geological features found along the lower sections of the modern Sabine River Valley near Orange, Texas, and in those interpreted for the buried river system in the offshore study area. On shore, the Sabine River has incised an alluvial valley, ranging from 3 to 7 miles in width, into late Pleistocene Prairie/Beaumont deposits. Deweyville terrace features fringe both sides of the valley and the characteristic "giant" meander and channel scars of the Deweyville are quire evident. The Holocene or modern floodplain of the Sabine River is confined to the central portion of the valley and is characterized by the present Sabine River course as well as relict meander belts and channel segments of earlier courses of the river. This is substantially the same setting reconstructed for the offshore study area on the basis of seismic records. The geologic setting, geomorphic history and archaeology of the modern Sabine River Valley, therefore, provided a useable, and presently essential, model for identifying and dating features observed on seismic records in the offshore study area and in assessing the probability of

archaeological site occurrence. The data collected offshore demonstrated that extensive areas of buried late Pleistocene/early Holocene landforms are preserved in the offshore study area. Many of the offshore settings identified are known on the basis of onshore archaeological data to be locales commonly associated with prehistoric remains. This primarily geological exercise served as a necessary prelude for our effort to locate cultural resources within the offshore study area.

Vibracores were taken at five offshore locations selected as high probability locales. One of these areas produced data that we have interpreted as evidence of archaeological remains. This was in the Sabine Pass 6 lease block located about 10 miles offshore (Figure 1). This area is situated on the eastern side of the former Sabine River Valley and includes a portion of Deweyville floodplain and two relict Deweyville channels. Figure 2 presents a plan view of the area derived from the seismic records. Contour lines measure feet below the present seafloor to the identified Deweyville surface. The track of the seismic survey vessel and the vibracore locations are also shown.

Figure 3 presents our geological interpretation of an east-west line of vibracores taken at this location. This section extends across the southern tributary stream and into the main Sabine River Valley to the northwest. Basal deposits consist of Deweyville terrace clays and, in the stream and the Sabine Valley, freshwater organic deposits laid down prior to marine inundation of this area. Immediately above these organic deposits is a silty clay facies interpreted as river mouth deposition. Blanketing this deposit is a thin stratum of sandy-to-silty clay that is heavily burrowed and contains numerous shells of the brackish-water clam *Rangia cuneata*. Foraminifera species in this deposit indicate moderate salinities. This facies was probably formed with the initial expansion of estuarine systems into the area. This blanketing, disturbed zone was noted in most of the areas examined and is critical in marking the boundary between marine conditions (above) and pre-inundation conditions (below). Archaeological materials are expected to be found primarily within or beneath this deposit.

Above this boundary zone is a massive deposit of gray clay which represents bay/estuarine fill (Figure 3). The homogeneity of this deposit suggests relatively rapid sedimentation. The uppermost stratum in the section consists of heavily burrowed clay containing varieties of marine shell. This represents modern open gulf seafloor deposits.

Deposits of archaeological interest at this location included a thin, heavily organic feature which rested atop the Deweyville terrace bordering the filled stream. These deposits were encountered in Cores 2-A, 2-B, and 2-C and are shown as a thin black stratum above the Deweyville terrace deposits in Figure 3. This feature lies immediately below the boundary zone mentioned above and appears to be largely intact and undisturbed by marine inundation. Pollen samples from this deposit contain high percentages of grasses and a diversity of arboreal types, suggesting an upland/swamp interface. Analysis of vibracore samples produced large quantities of charred wood and vegetation, nut hulls, seeds, fish scales and bone. Much of the bone is carbonized and some is definitely calcined. In addition to fish bone are fragments from reptiles, birds, and small mammals. The quantity of bone fragments is extremely high; some of the samples produced projected counts of over 700 fragments of bone per kilogram of sample. The vibracores indicated that the bone concentration covered a relatively small area of about 100 feet across. The concentration and variety of bone in this deposit were far greater than in any other area examined. Radiocarbon dates from this location suggest that these organic deposits date to around 8800 B.P.

The critical question, of course, is whether these organic deposits represent cultural remains. In the very small core samples collected, we did not anticipate finding an identifiable artifact. Rather, it is the sedimentary character and content of the deposit that are most likely to be useful in making this assessment. The organic deposits exhibit a number of characteristics in content, configuration, and location which are consistent with those of known archaeological deposits, yet

are quite different from those of natural sediments (Coleman 1966; Gagliano et al. 1982). Bone concentrations can occur in natural settings; however, the variety and types found in the Block 6 area are not anticipated naturally. Most importantly, the co-occurrence of calcined and unburned bone in the deposit argues against a natural origin and suggests human activity. In addition, the location of this deposit represents an optimum setting for prehistoric site occurrence. If this locale was occupied around 8800 years ago, as is suggested by the radiocarbon dates, it would have been at the juncture of two streams representing relict and filled Deweyville channel segments and would have been adjacent to the modern valley wall, overlooking the Sabine river floodplain and/or estuary. Numerous prehistoric archaeological sites have been found in similar settings in the modern Sabine River Valley. The combined evidence suggests that these remains are, indeed, archaeological in nature. If so, they represent a unique set of archaeological data, providing clear evidence of prehistoric use of the continental shelf.

Our study has produced a large quantity of data and increased our knowledge of a small area of the continental shelf. The methodology used, which integrates concepts and models concerning prehistoric settlement, geologic history, and landform preservation potential, should have general applicability in the study of other areas and in furthering our understanding of prehistoric human utilization of a generally unexamined area of Texas, the continental shelf.

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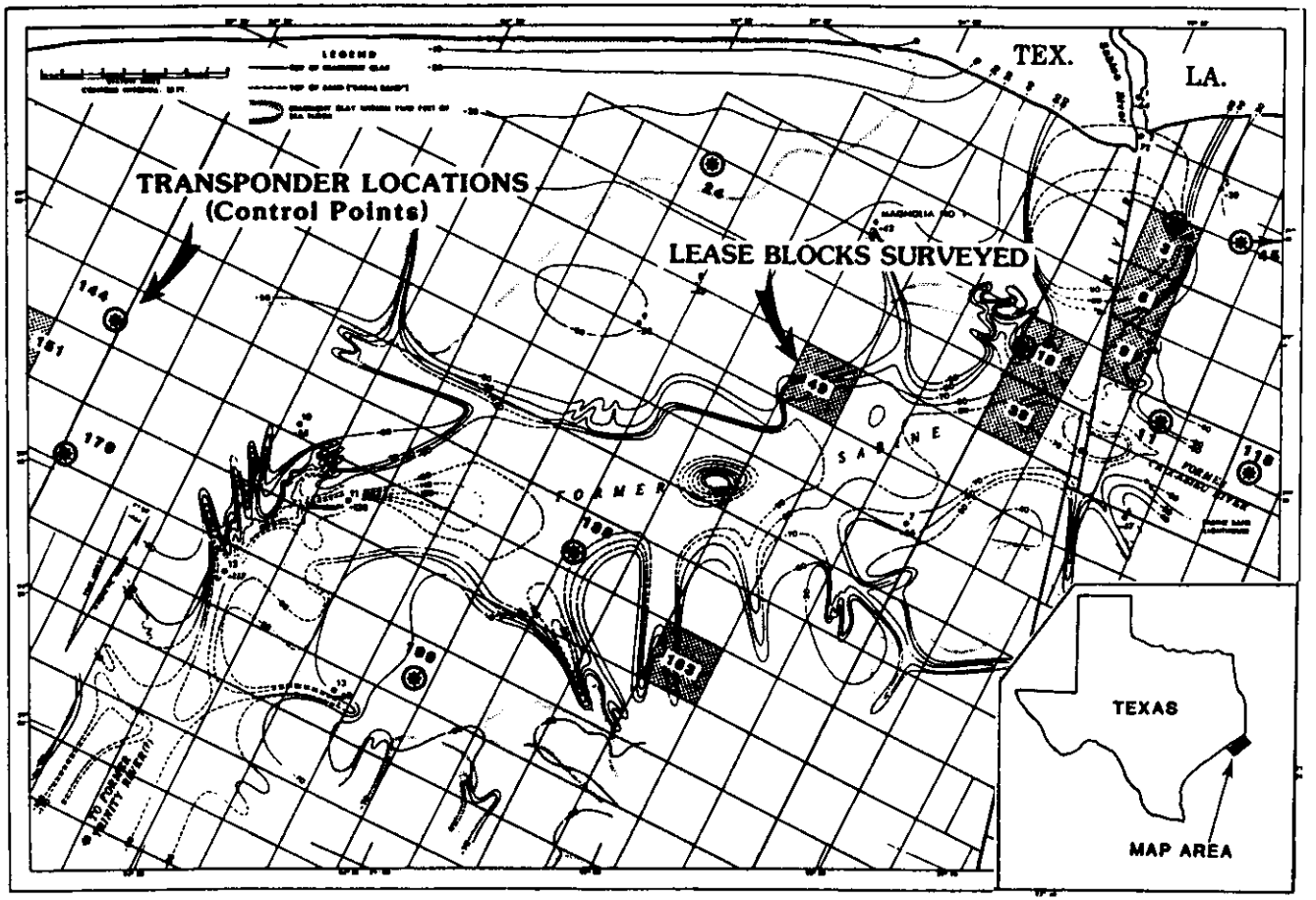

Figure 1. The study area showing filled and submerged Sabine River Valley (after Nelson and Bray 1970). Also shown are the lease blocks which were intensively surveyed and the locations of survey control points.

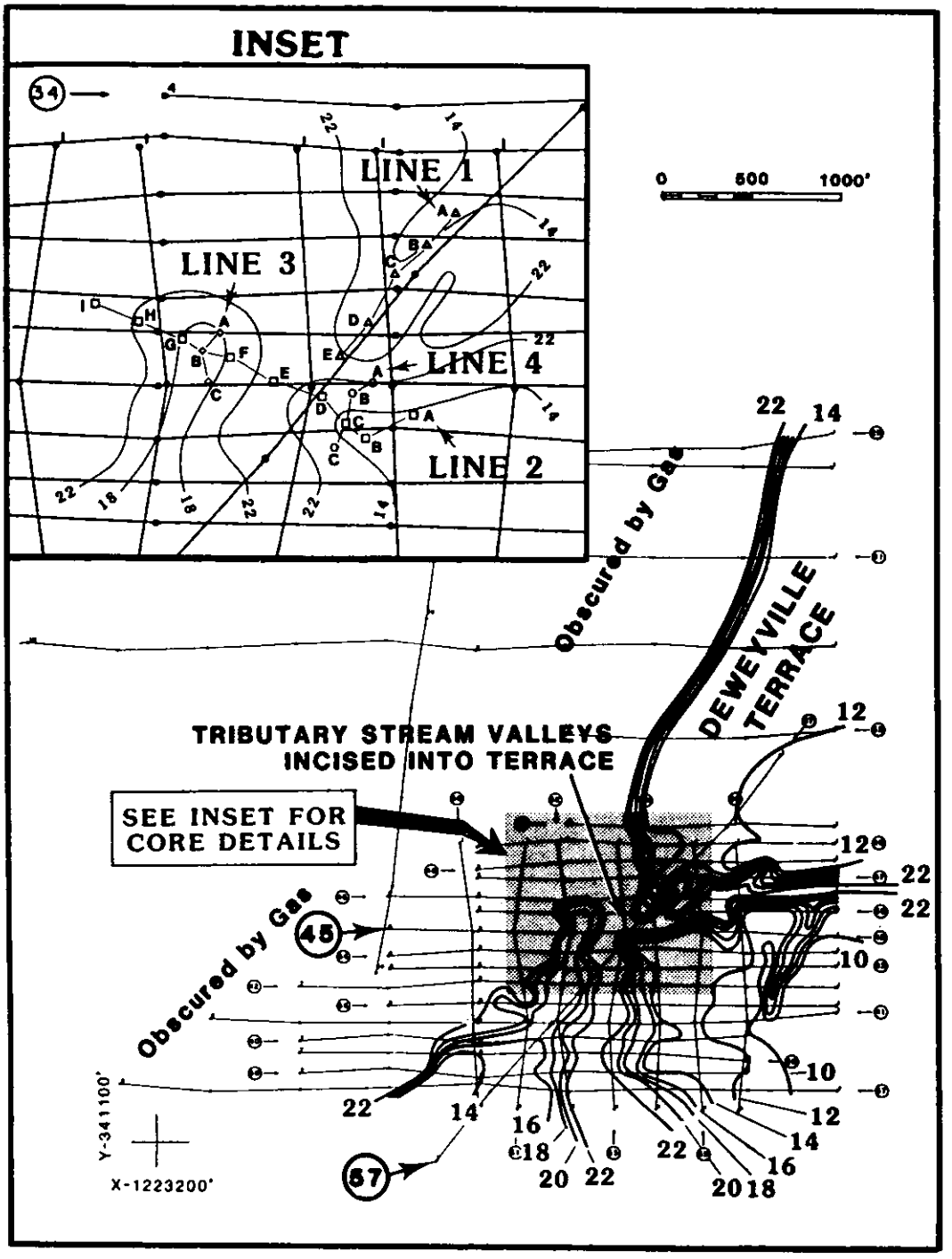

Figure 2. Plan view of features identified from seismic records in Lease Block 6. Contours are in feet below the present seafloor.

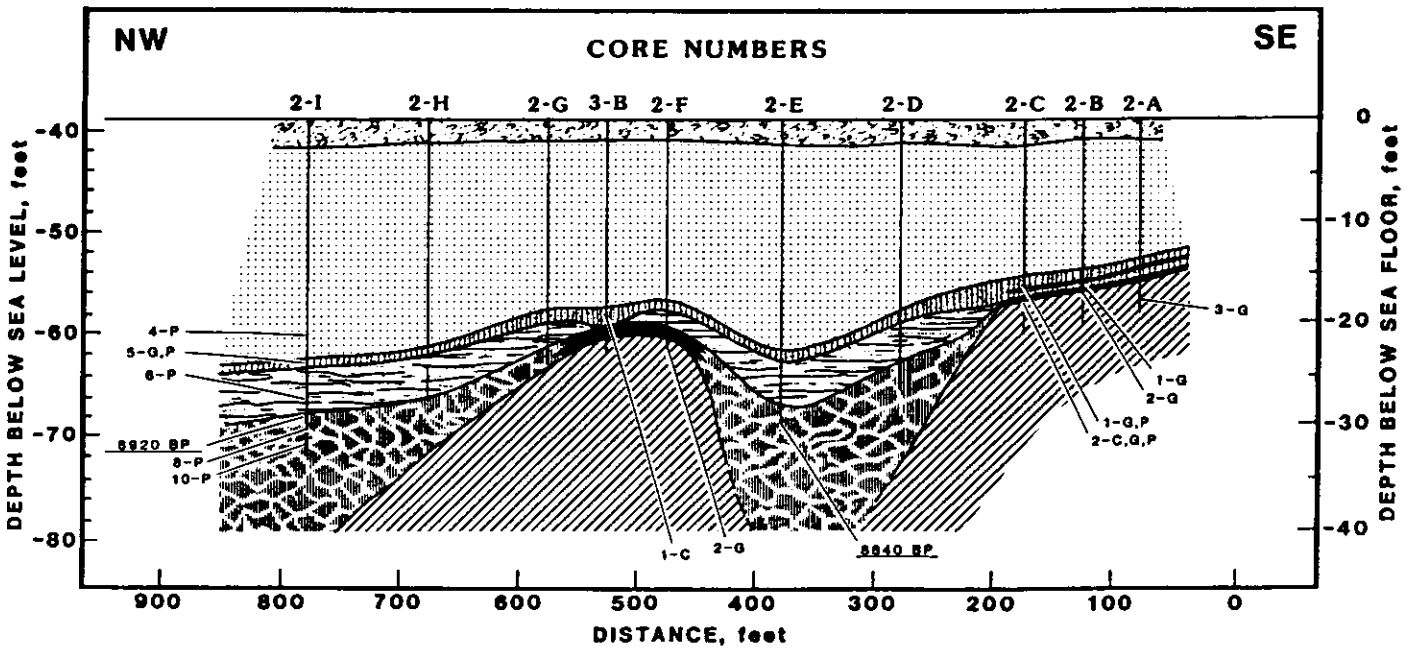

Figure 3. Geological cross-section interpreted from vibracores in Lease Block 6. See Key for explanation of sediments and features.

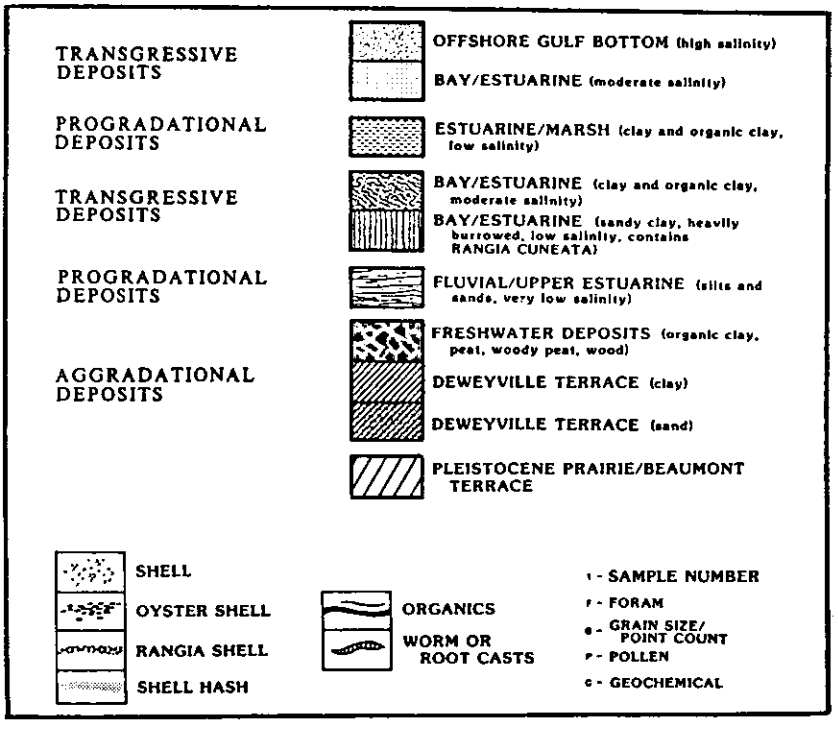

Figure 3a. Key to Figure 3

Evidence of Subsistence Practices

W. L. McClure

Anthropologists can tell a lot about your family by looking through your kitchen and noting the appliances and implements. They can tell more by seeing your grocery shopping list. If they could do this for a year, they could probably tell what country your ancestors came from, how many children in the house, etc. A detective can learn a great deal by observing the contents of your garbage cans. Again, the longer the time that is allowed for investigation, the more the data that can be developed. If the anthropologist and the detective made their investigations at the community trash disposal area, they could learn about the whole community. However, time begins to be a factor. Some of the trash gets incinerated and some of it gets consumed by gulls, rats, flies and bacteria. The longer the time between the disposal of the trash and the investigation, the less the information that is available. Some of the disposed material leaves no trace of its existence while others may survive indefinitely. The experts' conclusions relative to your cultural practices and particularly your food habits become less precise with time.

Archeologists have the same conditions to work with. They usually have only a very small fraction of the kitchen debris to examine. The material at hand may be from one meal or may be from numerous meals over an unknown number of years. However, archeologists work with what is available and try to reach conclusions about cultural practices, resource exploitation or some specific aspect of the lives of prehistoric peoples. For many years there was a theory that the earliest people to come to this continent followed the herds of large mammals and lived exclusively on a diet of red meat. As transients, they left little evidence of their cultural practices. Their tools were found either in isolated locations or with the bones of the large animals. When the large animals became extinct, the people had to change their practices. They became "hunters and gatherers," eating the smaller animals and such plant foods as they could harvest. This lifestyle required movement from one area to another as the resources were exhausted. This lifestyle also prevented establishment of permanent residences. The amount of debris left at any one camp site was thus more than that of the earlier peoples but it was left to the elements until the next round of occupation, perhaps a year or more later. Still later, some of the groups learned that growing their own food would allow them to stay in the same place for an extended period of time. Thus a community trash disposal system may have developed.

Food residue at an aboriginal site would have been accumulated in a variety of ways. Some parts would have been discarded during processing and cooking. Others would have been discarded after consumption. Some may have been accumulated and then placed in a pit or other designated dump site. Still more of the residue would have been passed through the digestive tracts of the people and disposed of in whatever manner was the cultural practice at the time.

After the material is discarded, it is subjected to a variety of actions that tend to alter and reduce it. Some would have been trampled under foot and others would be exposed to fire during subsequent cooking at the site. Some would have been altered by any pets that may have been in camp. After the people moved on to other locations, other forces would have been at work. The material would have been exposed to the weather and the activities of rodents and other scavengers. Wind and water may displace part or all of the material as well as bury it. Once it is buried it is subject to other actions. Soil chemicals tend to decompose the material, particularly in the acidic soils of the upper Texas coast. Roots of plants invade and displace the objects. Burrowing insects and mammals also would cause the material to be moved and reduced to smaller pieces. This activity also could cause the material from separate intervals of deposition to come together within the soil. The passage of hundreds of years between deposition and recovery make the process of

understanding the practices of prehistoric peoples difficult to say the least. Even the process of recovery causes some physical deterioration of the material.

Archeologists seldom recover remains of plants that have been used for food. The preparation and consumption usually leaves the parts unrecognizable. Decomposition in the soil is rapid except for those parts that may become carbonized. There are techniques for microscopic analysis of plant residue but I am not aware of any such investigations being used in the upper Texas coast. Bones last longer in the soil and are commonly recovered in excavations. Unless the soil is passed through a fine-screen, only the larger bone fragments are retained. Many excavation reports include reference to the bones that were recovered with most emphasis being on bone artifacts.

An early archeological project in the Houston area was at the site of Addicks Reservoir. Joe Ben Wheat excavated a few sites there in the 1940s. The sites date from early Archaic times. Wheat found that the people had been eating deer, turtles, rabbits, opossums, bison, pronghorns and badgers, and perhaps a few clams and fish. The bison, pronghorn and badger no longer exist in the wild on the upper Texas coast. This type of information can give us some hint about climatic changes that have occurred since people moved into the area.

The people who lived along the coast and around the bays ate a lot of clams and oysters. Mounds of shells abounded at the time that European settlers moved into the area. A few of these mounds have been excavated and they have been found to contain bones of fish, deer, alligators and other animals. Gars are very common in these sites, perhaps because their scales are much more resistant to deterioration than are the scales and bones of other fish. Some of the inland sites also include shells of freshwater clams, but many of them do not. This may some day help us to make some conclusions of tribal boundaries. It appears logical that someone who eats clams on the bay would eat them while traveling inland. Sites with clams are common on the San Bernard River and are less common on the Brazos. The people on White Oak Bayou apparently did not eat clams, even though they were common. On the San Jacinto River and Buffalo Bayou, clams apparently were a minor part of the diet. The alternation of clams and oysters in a site can also give us information about changing salinities in the estuaries of the coast.

One aspect of the consumption of clams is the impact the shells have on the soil. The shells change the acidity of the soil enough that bones are not destroyed as quickly as they are in soils without the shells. Excavations of clam shell sites along the San Bernard River by the Houston Archeological Society have allowed us to identify bones of animals that are not recovered from non-clam sites. The earliest levels of occupation have revealed that the people were eating small animals as well as the larger varieties. Rodents, snakes, frogs, turtles and tiny fish all were on the menu. Many of the smaller species would never have been recovered without the clams' influence or without using fine-mesh screens for part of the recovery effort.

Consumption of fish that were shorter than 10 cm would require collection techniques different from those used for larger fish. Nets would have to have fine mesh. Perhaps the people deliberately visited certain sites after periods of high water so they could gather the small fish by hand as the ox-bows or other lateral pools dried up.

Excavations at one of the clam shell sites also yielded the bones of a small rodent that has become extinct in Texas during the last 90 years. The causes of extinction of the rodent are not thought to be the same that killed off the larger Pleistocene animals and may not be the same that pushed some of the modern species hundreds of miles to the west. Perhaps these remains will lead us to the reasons that other animals such as the Houston toad, the prairie chicken and the smooth green snake are now in danger of extinction. Study of bones from sites has not refuted the theory about the earliest occupants of the area being strictly meat-eaters. However, it has been demonstrated that, from the earliest levels of occupation yet examined, small mammals, small fish and reptiles were on the diet along with the larger animals. It is my opinion that they ate anything

that they could catch.

Archeological Implications of an Ethnographic Shell Midden

Tom D. Dillehay

One problem of upper Texas coast archeology that has interested me over the past several years, and has stimulated me to carry out the work discussed here, is the function and meaning of small shell midden sites (Aten 1983; Dillehay 1973), and the social and economic forces that formed them. Instead of reflecting on my previous archeological work in the Trinity River Delta, I prefer to relate an ethnoarcheological experience that I had with an indigenous group at a small *curanto* (meaning shellfish cookout) site on the coast of south-central Chile, where I have been working intermittently over the past several years. The social, economic, and demographic aspects of *curantos* are interesting in terms of the spatial and material patterning they generate, and especially in terms of their relevance to understanding the archeology of shell middens in Texas and elsewhere. I will explain briefly the ecological and ethnoarcheological setting of *curanto* shell middens, and describe the major aspects of my work.

In southwestern South America, the cold Humboldt Current runs along the coasts of Chile and Peru, bringing with it an abundant supply and a wide variety of marine resources, including various species of shellfish. Three indigenous groups live along the south-central coast of Chile, the Mapuche, Huilliche and Chilota. These groups have a mixed economy of fishing, gardening, plant gathering, hunting, and shellfish collecting. In isolated coastal areas, nuclear families living in scattered households subsist primarily on a year-round supply of aquatic resources in small bays, inlets, saltwater estuaries, and freshwater swamps. Supplemental plants and game are procured from adjacent woodlands and freshwater lakes and from trade with interior groups.

Curantos of varying sizes are one of several types of sites produced by coastal groups. (Others are inland gardening, hunting, and/or fishing sites.) Although a *curanto* may take place either in maritime or inland areas, it is a coastal tradition. People congregate at *curantos* to fish, to collect shellfish and other close-to-shore resources including algae, to visit, and to plan inter-household social and economic activities. Small *curanto* middens, measuring 100 to 200 m^2 in areal extent and 2 to 20 cm in thickness, are generated by planned and unplanned, transitory social encounters among families and friends moving up and down the coast or to and from interior areas. *Curantos* may be attended by as few as five people or as many as 50, and they may last a few days or a few weeks.

I should mention that, in contrast, larger shell middens, ranging from 200 to 700 m^2 in areal extent and 0.5 to 2.5 m in thickness, are semi-permanent to permanent domestic sites of single or multiple households. These middens are almost always located at the base of a hill or bluff near the seashore, on a large sand dune overlooking a bay or inlet, or on a stream terrace within 1 km of the coast. Archeological and ethnographic evidence indicates that most large middens have been intermittently occupied since at least late prehistoric times, though many sites are probably several thousand years old. In the following account I will focus specifically on the small *curanto* site.

The location of a *curanto* is determined by three main factors. First and foremost, the location of a plentiful clam bed. Second, a place centrally and/or conveniently located between the residences of visiting families and/or friends. And third, the presence of nearby swamps and estuaries where edible plants and game (e.g., deer, crayfish, and bird) can be found.

In addition to being a social event, a *curanto* is also a traditional meal; it is made up of clams (*locos, Concholepas*), *nalca* or *panqui* (a soft, edible leafy plant), potatos (wild and domesticated), other minor plants, and occasionally goat cheese. All of these elements are heated in a hearth and consumed, with shellfish served as the main course of the meal. (A *curanto* may consist only of

shellfish but supplemental foods are preferred.)

In 1979, I participated in a *curanto* attended by 32 individuals, 24 adults and eight children, at a small inlet near the community of Maullín. The site was situated about 100 m inland from the shoreline of the Pacific Ocean, On a low hill overlooking a shallow freshwater stream, and was centrally located between four consanguinely related nuclear families whose households were spread over a 6-km-long section of the coast. Several terrestrial resources were available within a 1-km radius of the inlet. Although I was at the *curanto* only for one afternoon (it lasted for one day), I was able to record several types of behavioral data, and to map the debris abandoned in the site (Figure 1).

The meal consisted of about 500 clams (or *locos*) gathered in the inlet and transported to the site, five large *nalca* leaves (a wild edible spinach-like plant) collected in the nearby forest, and about 70 potatos brought from household gardens. A hearth measuring about 1 m in diameter and 10 cm in depth was built. Small cobbles of basalt and granite were placed in the pit, wood chips and branches were gathered and placed on top of the stones, and then lighted. Once the fire died out and the stones were heated, the potatoes and clams, wrapped in *nalca* leaves, were laid on top the steaming rocks. Sod and grass were placed on this, and the meal heated for 2 hours. Once ready, the sods were removed, the shells and potatoes were unwrapped, and the feasting began.

The core area of the site was about 20 m^2. Food preparation took place in one area but consumption revolved around the hearth, from which food was drawn. During the feast, individuals would obtain a portion of shells and gather a few meters away. A few individuals remained by the fire. The seating, or standing, plan and the discard zones of shell and debris conditioned the dispersion and the physical state of the shells. People gathered in groups of 3 to 5 individuals and dropped the shells where the clams were opened and consumed. There were several toss zones around the hearth. As a result, small discontinuous clusters of shell formed in the site, with the largest near the hearth and several wooden planks placed on the ground to serve as a table.

As for the resulting condition of discarded shells, trampling fractured a large number of them. Little fracturation was attributable to heating or prying shells open to obtain the flesh. In fact, it was difficult to distinguish unheated shells from heated ones, because very few of the latter were cooked or directly exposed to fire or high temperature, and thus not discolored or altered in any way that was visible to the naked eye.

Other than a broken glass jar which was crushed into the ground near the hearth, there were few other artifacts left behind. Such perishable remains as wood chips, *nalca* leaves, berry seeds, and potato skins were discarded.

I had the opportunity to return to the site in 1983, to inspect the surface debris. Grass and brush had grown over the area. I scraped away a few centimeters of soil and recovered the hearth and several shells. As I dug deeper, I came across a second shell layer which was an earlier *curanto*, indicating repeated use of the site. (I later learned that a group of different families held a *curanto* at the site in 1976.) Although the two layers were stratigraphically separated by 2 to 3 cm of soil, there were places where small pockets of shell in the upper layer had filtered down and were in direct contact with material in the lower midden. I excavated a 1-by-1 m pit to a depth of 50 cm and observed five other shell lenses (each 2 to 4 cm in thickness). Sections of each of these were in contact with the midden above and below it, and each contained the same type of clam (*locos*). The stratigraphic profile also revealed that worm and animal burrowing, bioturbation, soil compaction, and apparently human activity (excavating pits and hearths) were the primary agencies that had displaced and compacted sections of each midden. Based on the stratigraphy of these sections, the site could be interpreted as a single midden deposit which accumulated as a result of continuous occupation instead of ethnographically known intermittent use. And based on the observation of similar stratigraphic patterns and inferred processes at archeological sites and at other ethnographic

locations, I speculate that, as more time passes and as the individual shell layers in the Maullín Site are continuously affected by natural agencies, they will eventually merge and compact to form a *single, thick shell midden* somewhat similar to the deposits seen at larger, more permanently occupied domestic sites. Stratigraphy and site size are obvious, important factors for identifying large and small shell middens. Other factors are artifact and feature content and patterning. For example, large sites usually contain a greater amount and diversity of cultural debris and features that are more specialized and internally patterned than those in small sites.

In conclusion, space does not allow me to elaborate on the internal differences and similarities among different types of middens and between middens and other types of sites in south-central Chile. Hopefully, I have provided enough information to offer a few insights into shell midden archeology, and particularly into some of the cultural and natural agencies that form and disturb them.

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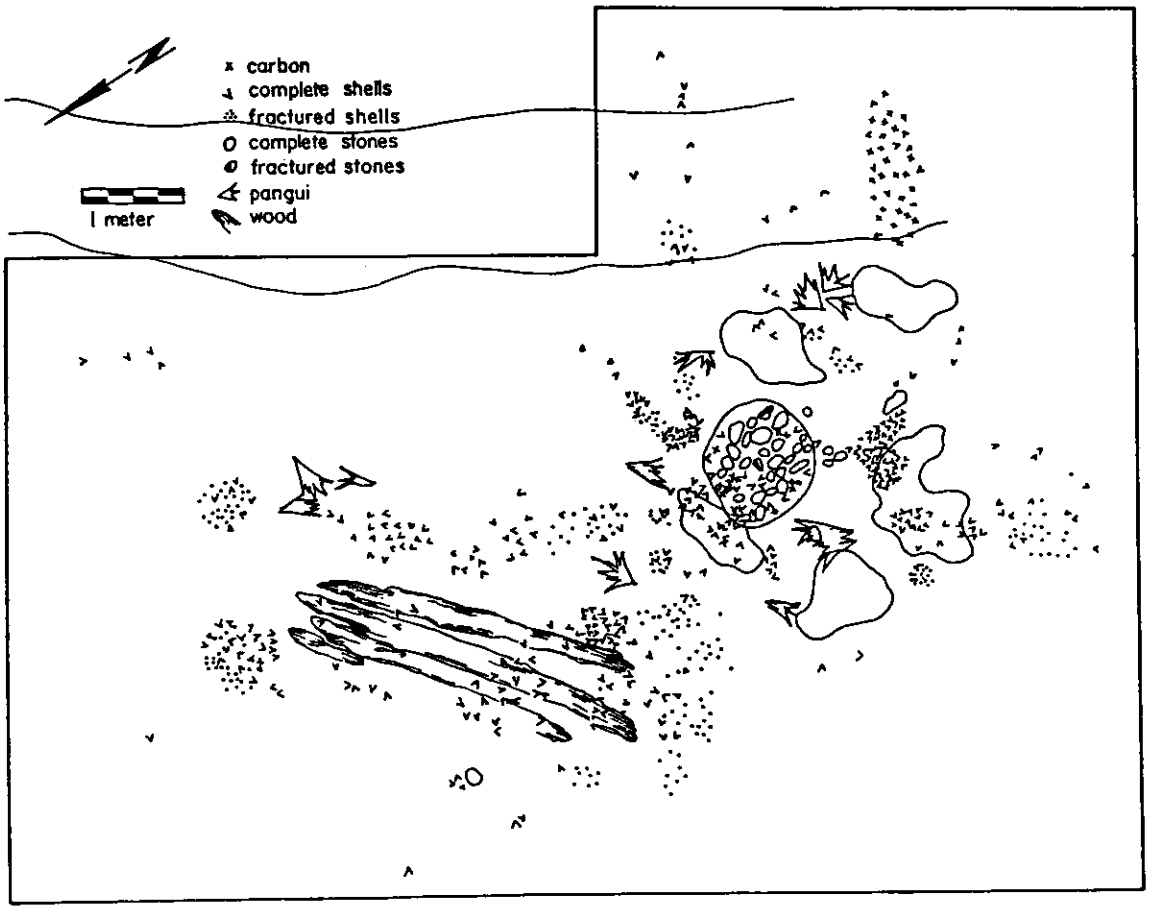

Figure 1. Location of shell and cultural materials in the Maullín *curanto* site

Historic Resources of Addicks and Barker Reservoirs

Carolyn Good

The Galveston District, Corps of Engineers, constructed Addicks and Barker Reservoirs in Harris and Fort Bend Counties in the 1940s and continues to operate the reservoirs to provide flood control protection to Houston. At the time of construction, Joe Ben Wheat of the Smithsonian conducted survey and site excavation of prehistoric mounds in the areas of dam construction. The mounds yielded a rich array of stratified lithic and ceramic artifacts and human burials. On the basis of these excavations, Wheat developed a prehistoric chronology for the inland upper coast of Texas that is still in use today. Materials recovered by Wheat and in subsequent excavations date from Paleo-Indian to historic. In more recent years, systematic survey by the Corps of Engineers of approximately half of the 26,000 acres comprising the reservoirs has identified a number of additional sites, including over 100 prehistoric and 40 historic sites. The typical prehistoric site is a small campsite, probably occupied by an extended family or small band for a brief period of time. Evidence from survey and site excavation indicates that these prehistoric inhabitants were nomadic hunters with limited material remains.

Historic sites in the reservoirs reflect a rich heritage of 19th century German immigrant farmers and dairymen, and some of the original ranching families of Southeast Texas. Many of these families are still represented in the Houston area. Both archival and oral history research have been conducted, and tentative plans are being made to incorporate interpretation of these historic sites into future park development in Addicks Reservoir.

Both reservoirs are being developed for recreation, and existing facilities are heavily utilized. Every effort is being made by the Corps of Engineers to protect and preserve sites as park development and use proceeds. Unfortunately, one form of recreation that has developed is the unauthorized digging and vandalism of known historic and prehistoric sites. Such activities are highly destructive of what could be invaluable scientific information, and are illegal on federal lands. Under federal law, heavy fines, confiscation of personal property, and imprisonment can result from these illegal activities. It is hoped that greater public awareness of the value of this nonrenewable resource will encourage site preservation on both public and private lands.

Post West Bernard Armory

Joe D. Hudgins

Introduction

The Post West Bernard site is in Wharton County about 6 km (4 miles) west of Hungerford, near a spring about 69 m (75 yards) west of the present channel of the West Bernard River. This site, recorded as 41WH16 with the Texas Archeological Research Laboratory at the Balcones Research Laboratory of the University of Texas in Austin, is in a cultivated field, so some of the artifacts were exposed at the surface. Initial surface collecting was done by the writer, who took note of the heaviest concentrations of various types of artifacts.

Cultivation of the site area was to be continued, so the writer, with the consent of the landowner and the farmer, asked the Houston Archeological Society to survey the site further and salvage the remaining artifacts. The site was mapped, and a grid of 5-meter squares was set up covering the roughly rectangular area in which artifacts had been found. A systematic search for metal artifacts was made using a metal detector; they and nonmetal artifacts, such as fragments of glass, ceramics, and gunflints, were plotted on the grid (Hudgins 1987:155-159), and each was recorded, bagged, and labeled. Plan maps of artifact distributions were made, but vertical placement of the artifacts was not recorded since all were found in the disturbed plow zone.

The metal artifacts were taken to the Department of Nautical Archeology at Texas A&M University in College Station, where they were treated by electrolysis and impregnated with a special wax to retard further oxidation.

The Wharton County Historical Museum in Wharton, Texas is the curator of all the artifacts and survey notes from the site.

History

Post West Bernard was established soon after the mass furlough of the troops at Camp Bowie in May and June of 1837. After the furlough most of the army's artillery, ordnance stores and 653 muskets, described as out of order, were taken to Post West Bernard (Pierce 1969:179; Nance 1963:44). Documents in the Texas Archives show that a wagonload of muskets and a large amount of ordnance were being shipped from Post West Bernard to the Houston armory in 1839 (Williams 1984). The last document found concerning the armory at Post West Bernard is dated February 1839 (Pierce 1969).

During the early years of the Republic of Texas there were no standard arms issued for the Texas Army; therefore any weapons that were available were incorporated into the armory. Personal arms such as flintlock muskets, rifles, pistols, and shotguns arrived with volunteer units coming to Texas. Also, there were 440 flintlock muskets shipped into Texas by the U. S. Government in 1836, but most of the weapons in the Texas armory were muskets captured from the Mexican Army at the Battle of San Jacinto. The Mexican troops were armed with British muskets, primarily the India Pattern Brown Bess (Koury 1973).

Artifacts

At least 65 percent of the gun parts found at the site were from British muskets. The remaining gun parts found were from U. S. muskets models 1795, 1798, 1808, 1812, and 1816 and from nonmilitary rifles, pistols, and shotguns (Crowley and Brezik 1985).

The gun parts found at the site included 31 lockplates in various stages of assemblage (Hudgins 1985a:Table 1), 25 sling swivels, 8 butt plates, 12 side plates, 32 rampipes, 9 nose caps, several gunflints, 65 trigger guards, several triggers, 3 breech plugs, 5 bayonet fragments, 21 hammers, 3 broken and bent musket barrels and a barrel fragment of a .45-caliber octagonal rifle. Also found were a lead-dipper, tongs, dipper handles, melted lead, 24 lead musket shot, and several iron and brass canister shot (Hudgins 1985b). Many of the brass trigger guards, rampipes and butt plates from the British muskets had been cut, broken or melted, and it is very likely that the armorers at the post were making canister shot from this material.

Personal items such as pocket-knife fragments, brass thumb tacks, a brass sewing thimble, and brass buttons from men's clothing were also found (Hudgins 1985c). These items were concentrated at the north end of the site.

Seventy-five ceramic sherds and 44 fragments of glass were found. These items were concentrated in the southern area of the site. The collection of ceramics appears to be of the Regency period (1800-1839) and probably represent dinnerware that was used by the men at the post (Briggs n.d.). The glass fragments were determined to be from wine, ale, or spirit bottles (Wetzel 1985).

Conclusions

The existence of such a large number of flintlock gun parts, together with evidence from correspondence in the Texas Archives (Briggs 1983; Williams 1984) strongly suggest that 41WH16 is indeed the site of the Post West Bernard armory. No records of daily activities of the men stationed at Post West Bernard have been found, but from the type and condition of the gun parts it appears that the men were involved in reconditioning arms.

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